

ADSC 2026 Programme

African Data Science, for Africa

23–26 June 2026

Wits Science Stadium, University of the Witwatersrand, Johannesburg, South Africa

Pre-conference workshops:	Tuesday, 23 June 2026
Main conference:	Wednesday, 24 June – Friday, 26 June 2026
Format:	In-person conference with scientific sessions, keynote addresses, panels, posters, workshops, exhibitions, and networking engagements.
Status:	Final Programme.

https://www.wits.ac.za/adsc2026/
https://africandatascienceconference.com/
https://www.linkedin.com/company/african-data-science-conference/

ADSC Partners and Sponsors

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1. WELCOME MESSAGES

African Data Science Conference 2026

African Data Science, for Africa

ADSC 2026 is convened as a continental platform for research exchange, postgraduate development, industry engagement, responsible innovation, and African-centred digital transformation. The welcome messages below frame the conference as a shared scholarly and professional space in which data science, artificial intelligence, statistics, analytics, governance, infrastructure, and policy meet the practical development priorities of the African continent.

Message from the Conference Chair

Dr Farai Mlambo, University of the Witwatersrand

It is my great pleasure to welcome delegates, keynote speakers, panel chairs, workshop facilitators, authors, postgraduate students, sponsors, partners, exhibitors, reviewers, policymakers, industry practitioners, and members of the wider data science community to the African Data Science Conference 2026. Convened under the theme **African Data Science, for Africa**, ADSC 2026 is more than a conference programme; it is a continental platform for scholarly exchange, practical engagement, interdisciplinary collaboration, and long-term capacity-building in data science, artificial intelligence, statistics, analytics, and digital transformation.

This conference is grounded in the belief that Africa's data science future must be shaped by African realities, African talent, African institutions, and African priorities. The continent faces complex challenges in health, education, finance, infrastructure, governance, climate, urban development, agriculture, cybersecurity, language technologies, and public service delivery. These challenges require rigorous methods, responsible innovation, locally relevant data, strong institutions, and collaborative communities that can translate scientific insight into meaningful societal and economic impact.

ADSC 2026 brings together a rich and diverse programme of keynote addresses, scientific paper presentations, workshops, panel discussions, poster sessions, technology exhibitions, employability engagements, and networking opportunities. The programme reflects the breadth of contemporary data science, ranging from statistical modelling, machine learning, spatial analytics, public health surveillance, and computational artificial intelligence to responsible AI, research data management, institutional analytics, digital public infrastructure, financial intelligence, and educational artificial intelligence.

We are especially proud that this conference creates space for postgraduate students, early-career researchers, established scholars, industry leaders, public-sector stakeholders, and innovation partners to meet in one shared environment. In doing so, ADSC 2026 seeks to bridge academic excellence and practical relevance, while supporting the development of the next generation of African data scientists, AI researchers, analysts, policy thinkers, and digital transformation leaders.

Hosting this gathering at the University of the Witwatersrand is both an honour and a responsibility. Wits has a long tradition of research excellence, intellectual leadership, public

engagement, and contribution to national and continental development. Johannesburg, as one of Africa's major centres of finance, innovation, culture, entrepreneurship, and urban transformation, provides a fitting setting for a conference that asks how data science can serve African futures.

I extend my sincere appreciation to the Scientific Committee, Local Organising Committee, advisors, reviewers, keynote speakers, panel chairs and panellists, workshop facilitators, sponsors, partners, student representatives, volunteers, and all contributors who have helped bring ADSC 2026 to life. Your support has been essential in building a programme that is intellectually ambitious, operationally grounded, and deeply connected to the conference theme.

I warmly invite all delegates to participate fully: attend sessions, ask questions, visit posters, engage exhibitors, use the Delegate Portal, meet new collaborators, encourage students, and contribute generously to the conversations that will unfold over the conference. May ADSC 2026 strengthen our collective commitment to building data science and artificial intelligence ecosystems that are excellent, ethical, inclusive, context-aware, and transformative.

Welcome to ADSC 2026. Welcome to Wits University. Welcome to a shared conversation on **African Data Science, for Africa**.

Message from the Organising Committee Chair

Dr Taariq Surtee, University of the Witwatersrand

On behalf of the Local Organising Committee, it is my pleasure to warmly welcome all delegates, speakers, authors, workshop facilitators, panel chairs, sponsors, partners, exhibitors, postgraduate students, reviewers, volunteers, and institutional stakeholders to ADSC 2026. This conference has been carefully designed not only as a scholarly gathering, but as a full delegate experience that supports learning, collaboration, networking, professional development, and institutional partnership.

ADSC 2026 brings together a diverse community of people who are shaping the future of data science, artificial intelligence, analytics, research data management, digital infrastructure, and innovation in Africa. The success of such a gathering depends not only on the quality of the scientific programme, but also on the quality of the conference environment: how delegates are welcomed, how sessions are coordinated, how information flows, how people connect, and how partnerships are enabled.

The organising team has worked to develop a programme that balances academic depth with practical usability. The conference includes keynote addresses, scientific sessions, workshops, panels, poster presentations, exhibitions, employability engagements, networking opportunities, the ADSC 2026 Delegate Portal, and special delegate experiences. Each element has been included to support meaningful participation across academic, industry, public-sector, and professional communities.

Delegates are encouraged to use this printed programme together with the **ADSC 2026 Delegate Portal**. The portal provides an important digital layer for planning sessions, saving items of interest, connecting with other delegates, requesting meetings, participating in discussions, and keeping track of programme updates. We hope that delegates will use it actively to strengthen collaboration before, during, and after the conference.

As organisers, we are particularly mindful that conferences are not only about presentations; they are also about the relationships, ideas, opportunities, and future collaborations that

emerge between sessions. We therefore encourage delegates to engage fully: attend sessions beyond your immediate area of expertise, visit posters, meet exhibitors, support postgraduate presenters, participate in forums, and use networking spaces to build new academic and professional connections.

I extend sincere appreciation to the Conference Chair, Scientific Committee, Local Organising Committee, advisors, reviewers, Wits Enterprise, institutional partners, sponsors, student representatives, volunteers, technical support teams, workshop facilitators, speakers, panel contributors, and all colleagues who have contributed to the planning and delivery of ADSC 2026. Their collective effort has made it possible to build a conference that is both intellectually ambitious and operationally grounded.

We are honoured to welcome you to Wits University and to Johannesburg for this important gathering. May ADSC 2026 be a productive, engaging, well-coordinated, and memorable experience for all delegates, and may it contribute meaningfully to the growth of African-centred data science, responsible artificial intelligence, and collaborative research innovation across the continent.

Welcome to ADSC 2026. We look forward to hosting you.

Message from the Scientific Committee Chair

Prof Inger Fabris-Rotelli, University of Pretoria

On behalf of the Scientific Committee, it is my pleasure to welcome all delegates, authors, presenters, reviewers, session chairs, workshop facilitators, panel contributors, postgraduate students, and members of the broader data science community to ADSC 2026. Convened under the theme **African Data Science, for Africa**, this conference provides an important platform for advancing rigorous, relevant, and context-aware data science scholarship across the continent and beyond.

The scientific programme reflects the breadth, depth, and growing maturity of data science research in African and international contexts. The accepted contributions span statistical modelling, machine learning, artificial intelligence, spatial data science, public health surveillance, geospatial analytics, environmental and climate applications, business and financial analytics, research data management, institutional analytics, educational artificial intelligence, cybersecurity, digital infrastructure, responsible AI, governance, and policy.

In curating the programme, the Scientific Committee has sought to balance methodological rigour, disciplinary diversity, practical relevance, and African contextual significance. ADSC 2026 is intentionally interdisciplinary. It recognises that the most pressing data science questions do not belong to one discipline alone, but emerge at the intersections of statistics, computer science, mathematics, engineering, public health, business, economics, law, policy, education, environmental sciences, and the social sciences.

We are particularly encouraged by the strong participation of postgraduate students and early-career researchers. Their contributions speak to the future of data science on the continent. A conference such as ADSC 2026 is not only a space for presenting completed work; it is also a space for receiving feedback, developing scholarly confidence, forming collaborations, and becoming part of a wider research community committed to excellence and impact.

The review and programme-development process has depended on the generous intellectual labour of reviewers, committee members, session chairs, and disciplinary experts. I wish to express sincere appreciation to all those who contributed their time and expertise to

assessing submissions, strengthening the scientific programme, and helping ensure that ADSC 2026 reflects high academic standards. Peer review is often invisible work, but it is central to the credibility and integrity of any scholarly conference.

The papers, panels, workshops, and posters presented at ADSC 2026 remind us that data science must be both technically strong and socially meaningful. As African data science continues to grow, we must ask not only what models can predict, but also whose data are represented, whose problems are prioritised, whose languages are included, whose institutions are strengthened, and whose futures are shaped by the systems we build.

It is my hope that this conference will stimulate new collaborations, deepen methodological conversations, strengthen postgraduate research communities, and support data science that is responsive to African realities while meeting global scientific standards. May ADSC 2026 serve as a catalyst for excellent research, responsible innovation, and enduring partnerships across academia, industry, government, and civil society.

I warmly welcome you to the scientific programme of ADSC 2026 and look forward to the rich conversations, critical questions, and new ideas that will emerge from this gathering.

Message from Wits Institutional Leadership

University of the Witwatersrand

Wits University is honoured to host the African Data Science Conference 2026. As a leading research-intensive university located in Johannesburg, Wits occupies a distinctive position in Africa's knowledge, innovation, and public-impact landscape. The University is globally recognised for academic excellence, research depth, graduate employability, innovation, and its contribution to addressing complex societal challenges across the continent and beyond. ADSC 2026 aligns strongly with Wits University's mission to produce high-impact research, develop future scholars and professionals, strengthen public engagement, and contribute meaningfully to solutions for society.

Wits is exceptionally well suited to host this conference. The University has been ranked 1 in Africa in the 2026 Center for World University Rankings, placed 200 globally out of more than 21,000 universities, and recognised as being within the top 1% of universities worldwide. Wits has also been ranked #1 in sub-Saharan Africa for innovation performance in the 2025 Global Innovation Index, reflecting its ability to translate knowledge, research, and technology into economic and social value. These achievements are complemented by strong international recognition across major global ranking systems, including its performance in the Times Higher Education, QS, US News Best Global Universities, and sustainability rankings.

The conference takes place at a time when data science, artificial intelligence, digital transformation, and research-driven innovation are becoming central to the future of universities, industries, governments, and communities. Wits continues to invest in research visibility, responsible AI, innovation ecosystems, technology translation, and institutional platforms that enable researchers to create new knowledge and address pressing societal challenges. ADSC 2026 forms part of this broader commitment to strengthening Africa's role in the global knowledge economy.

Wits is proud of its growing contribution to artificial intelligence, machine learning, robotics, data science, digital innovation, and interdisciplinary discovery. The Wits Machine Intelligence and Neural Discovery Institute, known as the Wits MIND Institute, provides a powerful example of this commitment. As an African-based interdisciplinary AI research

hub, the MIND Institute brings together researchers across artificial intelligence, machine learning, neuroscience, ethics, philosophy, engineering, humanities, policy, and society to advance fundamental AI research, grow critical AI expertise on the continent, and ensure that AI development remains safe, inclusive, responsible, and beneficial to society.

The University also has significant strengths in computer science, applied mathematics, statistics, engineering, health sciences, climate science, financial technology, digital transformation, public policy, entrepreneurship, and the mathematical sciences. Wits researchers, innovators, and entrepreneurs are contributing to some of the most exciting developments in artificial intelligence, machine learning, robotics, digital health, fintech, sustainability, quantum technologies, and data-driven public problem-solving in Africa. These strengths make Wits a natural institutional home for a conference dedicated to advancing African data science for African realities.

Wits is also proud of its innovation and entrepreneurship ecosystem. Through initiatives such as the Wits Innovation Centre, the Wits Crucible Centre for Entrepreneurship, faculty-led research innovation, AI-enabled teaching and research, research commercialisation, spin-out support, and partnerships with industry and public-sector stakeholders, the University is helping to build the institutional foundations needed for future-facing knowledge and technology development. This ecosystem reflects the kind of collaboration between academia, industry, government, and society that ADSC 2026 seeks to strengthen.

The hosting of ADSC 2026 is therefore timely and significant. The conference brings together academics, postgraduate students, industry leaders, policymakers, innovators, professional bodies, funders, public-sector stakeholders, and technology partners to engage with the future of data science and artificial intelligence on the continent. It reflects the importance of building research and innovation ecosystems that are technically excellent, socially responsible, inclusive, and relevant to African realities.

The theme **African Data Science, for Africa** resonates strongly with Wits University's commitment to research that is globally excellent and locally meaningful. Across fields such as health, climate science, financial technology, digital infrastructure, AI governance, engineering, public policy, entrepreneurship, and the mathematical sciences, Wits researchers continue to contribute to knowledge that addresses complex societal challenges. ADSC 2026 provides an important platform for extending these conversations across institutions, sectors, disciplines, and national boundaries.

We are especially pleased that the conference foregrounds postgraduate development, scientific excellence, responsible innovation, industry engagement, employability, entrepreneurship, and African-centred digital transformation. These priorities are central to the future of higher education and to the development of the next generation of data scientists, AI researchers, statisticians, analysts, innovators, entrepreneurs, and policy leaders.

By hosting ADSC 2026, Wits reaffirms its commitment to convening spaces where ideas can be tested, partnerships can be formed, and research can move beyond disciplinary boundaries toward real-world impact. We welcome all delegates to Wits University and to Johannesburg, and we wish you a productive, inspiring, and memorable conference.

May ADSC 2026 strengthen collaboration, stimulate new ideas, and contribute to a more inclusive, innovative, and responsible data science future for Africa.

2. PROGRAMME SUMMARY PAGE

African Data Science Conference 2026

Wits Science Stadium, University of the Witwatersrand, Johannesburg
23–26 June 2026

The African Data Science Conference 2026 brings together academics, postgraduate students, early-career researchers, industry practitioners, policymakers, innovators, professional bodies, public-sector stakeholders, technology partners, and the wider data science community under the theme **African Data Science, for Africa**. The conference is conceived as a continental platform for advancing high-quality research, strengthening postgraduate development, deepening industry engagement, and promoting responsible, context-aware data science and artificial intelligence for African priorities. The programme combines scientific research presentations, keynote addresses, expert panel discussions, practical half-day workshops, poster engagement, technology exhibitions, employability-focused dialogue, and structured networking opportunities. It is designed to create meaningful interaction between theory and practice, enabling researchers, practitioners, institutions, and decision-makers to exchange knowledge, identify shared challenges, and explore collaborative solutions. ADSC 2026 foregrounds the role of data science in addressing Africa's social, economic, institutional, technological, and developmental questions. The conference spans a broad intellectual landscape, including statistics, machine learning, artificial intelligence, public health, bioinformatics, geospatial analytics, climate and environmental analytics, business and financial analytics, governance, cybersecurity, digital public infrastructure, research data management, institutional analytics, open data, educational artificial intelligence, and innovation. In doing so, it seeks to bridge academic excellence and practical impact while supporting the growth of an inclusive, rigorous, and African-centred data science ecosystem.

ADSC 2026 Programme at a Glance

10+
Keynote / Plenary Features
keynotes, plenary talks, invited papers and leadership

5
Panels
governance, education, advances and business transformation

6
Workshops
four morning and three afternoon half-day sessions

5
Scientific Themes
broad tracks across African data science and AI

3
Scientific Sessions
parallel research sessions across all themes

1
Tech Exhibition
innovation, industry and applied data science showcase

1
Employability Session
skills, careers and African data science talent

1
Gala Dinner
networking, reflection and conference community

1
Digital Dome
special closing experience and informal networking

Conference theme	African Data Science, for Africa.
Venue	Wits Science Stadium, University of the Witwatersrand, Johannesburg, South Africa.
Format	In-person conference with workshops, keynotes, scientific sessions, panels, posters, exhibitions, employability engagement, networking, and special conference experiences.
Wits page	https://www.wits.ac.za/adsc2026/
Conference platform	https://africandatascienceconference.com/
LinkedIn	https://www.linkedin.com/company/african-data-science-conference/

Scientific programme focus areas

Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations
Venue – WSS 1
Scientific Chairs – Prof Delson Chikobvu (University of the Free State), Raeesa Ganey (Wits University), and Dr Tsitsi Zengeya (University of KwaZulu-Natal)
Statistical modelling, mathematical and computational foundations, machine learning, deep learning, optimisation, simulation, computational artificial intelligence, natural language processing, speech technologies, large language models, multimodal AI, low-resource language modelling, and African language data systems.

Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Venue – WSS 2
Scientific Chairs – Prof Kennedy Otwombe (Wits University), Prof Raeesa Moolla (Wits University), and Prof Inger Fabris-Rotelli (University of Pretoria)
Health and public health data science, bioinformatics, geospatial analytics, environmental and climate data science, agricultural analytics, urban analytics, and sustainability-focused applications.

Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure
Venue – WSS 4
Scientific Chair – Dr Farai Mlambo (Wits University) and Prof Sunday Oladejo (Stellenbosch University)
Business analytics, financial and economic data science, organisational analytics, responsible AI, data governance, digital public infrastructure, cybersecurity, trust, and intelligent infrastructure.

Theme 4: Research Data Management, Open Data, Institutional Analytics, and Educational AI
Venue – WSS 5
Scientific Chairs – Dr Taariq Surtee, Eleni Flack-Davison and Lazarus Matizirofa (Wits University)
Research data management, open science, open data ecosystems, institutional analytics, learning analytics, educational artificial intelligence, and data-driven capacity-building.

Theme 5: Interdisciplinary Open Theme
Venue – WSS 3
Scientific Chairs – To be confirmed
This theme remains open at this stage. It provides space for interdisciplinary, emerging, cross-cutting, or late-breaking contributions that do not yet fall neatly within the assigned

scientific themes. No papers have been assigned to this theme at this stage.

3. INDUSTRY ENGAGEMENT

African Data Science Conference 2026

Connecting research, innovation, talent, technology, employability, and business transformation

Industry engagement is a central pillar of ADSC 2026. The conference has been designed not only as a scientific gathering, but also as a platform for connecting universities, researchers, postgraduate students, technology companies, employers, financial institutions, consulting firms, research laboratories, professional bodies, public-sector stakeholders, innovation partners, and digital transformation leaders.

Across the programme, industry engagement appears in multiple forms: sponsor and partner participation, pre-conference workshops, industry insight presentations, employability dialogue, technology demonstration, AI and data strategy engagement, governance discussion, business transformation panels, poster and networking sessions, the gala dinner, and the Johannesburg delegate experience. Together, these engagements create a practical bridge between academic data science and real-world implementation, with particular attention to African talent pipelines, responsible AI adoption, industry–university collaboration, digital innovation, organisational transformation, and evidence-informed decision-making.

Industry Engagement at a Glance

20+
Named Stakeholders
banks, insurers, technology firms, consulting firms, recruiters, research laboratories, regulators, public-sector partners, professional bodies, and innovation organisations

4
Industry-Linked Days
industry engagement is embedded from the pre-conference workshops on Tuesday through to the Friday closing experience

8+
Engagement Platforms
workshops, panels, partner sessions, employability evening, Tech Exhibition, Innovation Lounge, gala networking, and delegate city experience

6
Practice-Oriented Workshops
hands-on and industry-relevant learning across healthcare AI, LLM agents, research data infrastructure, connectivity, quantum, spatial data science, and data science in industry

5
Strategic Panels
governance, education, employability, advances in data science, and AI for business transformation

1
Open Innovation Space
a Tech Exhibition and AI, Data & Strategy Innovation Lounge for demonstrations, advisory conversations, start-up visibility, and applied collaboration

1

Flagship Employability Evening

a dedicated talent and hiring session linking students, graduates, employers, recruiters, HR leaders, professional bodies, and industry experts

R500,000

Strategy Workshop

BI Technologies Africa-sponsored Strategy Development and Execution Workshop linked to the AI, Data & Strategy Innovation Lounge

1

City Experience

Joburg Tourism-supported delegate experience connecting conference participation with Johannesburg's innovation, culture, finance, and urban transformation

Finance

Banks, Insurance & Markets

Standard Bank, Old Mutual, FNB, Absa, Discovery, and finance-facing analytics contributors

Technology

AI, Cloud & Applied Innovation

IBM Research Africa, Microsoft, BI Technologies Africa, ISAZI Consulting, Datawizzards, Opti-Num Solutions, Hatch, and digital innovation partners

Public Value

Regulation, Health & Open Research

ICASA, SAMRC, Figshare, Digital Science, Wits Libraries, Wits Open Data Vault, Joburg Tourism, and institutional partners

What the Numbers Represent

Named stakeholders	The programme includes participation from financial services, insurance, technology, consulting, research, public-sector, professional, and innovation organisations. These include organisations represented through sponsors, panellists, workshop facilitators, exhibition activity, employability contributors, and strategic partners.
Engagement platforms	Industry participation takes place through multiple programme formats rather than a single sponsor slot. These include the employability evening, Tech Exhibition, AI, Data & Strategy Innovation Lounge, industry partner sessions, applied workshops, governance and business transformation panels, poster networking, gala engagement, and informal delegate networking.
Strategy workshop	The R500,000 Strategy Development and Execution Workshop sponsored by BI Technologies Africa is positioned as a high-value strategy support intervention. It is not a cash prize. It is a facilitated engagement intended to help a selected organisation clarify strategic priorities, define measurable outcomes, develop KPIs, and build an execution roadmap.
Start-up visibility	The Tech Exhibition creates space for African tech start-ups and entrepreneurs to demonstrate practical solutions, engage delegates, meet researchers, connect with potential partners, and participate in the broader African data science and innovation ecosystem, subject to registration and space availability.

Talent pipeline	The employability evening connects the conference to Africa's data science skills agenda by bringing together employers, recruiters, students, graduates, academics, professional bodies, and industry practitioners to discuss careers, internships, workplace readiness, graduate recruitment, and the future of work.
Business transformation	The programme links AI and data science to organisational strategy by exploring how firms move from experimentation and proof-of-concept activity to scaled, measurable, governed, and sustainable business transformation.

ADSC 2026 treats industry engagement as a living programme thread rather than a single sponsor slot. The conference creates multiple points of contact between **research**, **talent**, **technology**, **governance**, **business transformation**, and **African innovation ecosystems**. Industry stakeholders appear as workshop facilitators, sponsors, panellists, exhibitors, employers, technology partners, research collaborators, public-sector contributors, and networking partners.

The structure is deliberately layered. Tuesday builds applied capability through workshops. Wednesday foregrounds responsible AI governance, posters, and employability. Thursday opens space for industry insight, education-industry alignment, technology demonstration, start-up visibility, and gala networking. Friday moves the conversation towards frontier advances, scaled AI transformation, prize recognition, institutional closing, and the Johannesburg delegate experience.

Industry Engagement Dashboard

Build	**Capability-building through workshops.** Industry-facing learning is embedded in the pre-conference workshops, including healthcare AI, trustworthy LLM agents, data science in industry, open research infrastructure, connectivity and computing for AI, and applied data science practice.
Hire	**Talent pipelines and employability.** The Data Science Hiring and Employability Evening connects students, graduates, employers, recruiters, HR professionals, graduate-employer bodies, and industry leaders around skills, internships, workplace readiness, graduate recruitment, and AI-shaped careers.
Govern	**Responsible AI and data governance.** The governance panel brings together academic, corporate, institutional, and policy-facing perspectives on accountability, data sovereignty, responsible deployment, corporate responsibility, and African AI governance architecture.
Teach	**Education aligned with industry change.** The Data Science Education in the Age of AI panel connects universities and industry around curriculum design, assessment, foundational knowledge, tool-based proficiency, employability, and the changing meaning of data science competence.

Showcase	**Technology demonstration and start-up visibility.** The Tech Exhibition and AI, Data & Strategy Innovation Lounge provide a practical space for demonstrations, advisory conversations, entrepreneurial visibility, sponsor engagement, and applied collaboration.
Scale	**From experiments to business transformation.** The AI for Business Transformation panel examines how organisations move from pilots and proofs of concept to governed, measurable, enterprise-wide, and sustainable AI-enabled transformation.
Connect	**Networking across formal and informal spaces.** Poster sessions, tea breaks, sponsor engagement, the gala dinner, the Digital Dome / Planetarium experience, and Joburg Tourism-supported sightseeing create relational spaces for collaboration beyond the lecture room.
Recognise	**Celebrating excellence and contribution.** Prize giving, institutional closing, sponsor visibility, and partner recognition reinforce the conference's commitment to excellence, service, postgraduate development, and African data science leadership.

The organising idea: ADSC 2026 moves industry engagement from the margins of the conference to the centre of the delegate experience. The programme asks not only *what research is being produced*, but also *who will use it*, *who will govern it*, *who will hire the talent*, *who will build the systems*, *who will scale the solutions*, and *how African institutions can shape the future of data science and AI on their own terms*.

TECH EXHIBITION AND INNOVATION LOUNGE

Innovation, Start-Ups, and Strategy Execution

The industry engagement component of ADSC 2026 is designed to move beyond symbolic sponsorship and create meaningful interaction between research, talent, technology, and implementation. Across the conference, industry partners contribute to scientific conversations, employability dialogue, technology demonstration, AI strategy, responsible innovation, business transformation, and postgraduate development. This engagement model recognises that Africa's data science ecosystem depends on more than academic papers alone. It requires employers who understand emerging skills, technology firms that can translate methods into usable systems, banks and insurers that are applying AI at scale, research laboratories working at the frontier of innovation, public-sector actors concerned with infrastructure and regulation, and start-ups building context-aware African solutions. ADSC 2026 brings these communities into one shared space.

Why this matters

ADSC 2026 recognises that African data science cannot grow through academic activity alone. It requires strong links between research, industry practice, public-sector priorities,

technological infrastructure, professional development, talent pathways, responsible governance, and institutional collaboration. Industry stakeholders bring practical problems, implementation experience, organisational insight, technology platforms, employment opportunities, sector-specific knowledge, and pathways to scale. Universities and research institutions bring methodological depth, critical inquiry, postgraduate talent, ethical reflection, and long-term knowledge production. By bringing these communities together, ADSC 2026 seeks to build a more connected African data science ecosystem: one in which research informs practice, practice informs research, students understand the future of work, employers access emerging talent, start-ups and entrepreneurs find visibility, and organisations collaborate around responsible, inclusive, and impactful data science and artificial intelligence.

4. DAILY QUICK REFERENCE PAGES

ADSC 2026 at a Glance

Key sessions, workshops, panels, exhibitions, networking events, and closing experiences

Tuesday, 23 June 2026

Pre-Conference Workshops
Venue: New Commerce Building, West Campus, Braamfontein

- **08:00–08:30:** Registration and breakfast tea for workshop delegates.
- **08:30–09:00:** Welcome and orientation by Dr Ndivhuwo Makondo. Venue - NCB3
- **09:00–12:00:** Morning parallel half-day workshops:
  - Machine Learning and Artificial Intelligence in Healthcare, facilitated by Prof Innocent Maposa, Stellenbosch University; Dr Yusentha Balakrishna, Dr Isaac Singini, and Mr Siyabonga Mavundla, SAMRC. Venue - NCB1
  - Internet Connectivity and Computing as Enablers of Artificial Intelligence, facilitated by Dr Songezo Soso Mata, ICASA. Venue - NCB2
  - Beyond Vibe Coding: Building Trustworthy Data Science with LLM Agents, facilitated by Naweed Khan and Dr Ndivhuwo Makondo, IBM. Venue - NCB3
- **12:00–13:00:** Lunch and networking.
- **13:00–16:00:** Afternoon parallel half-day workshops:
  - From Data to Discovery: Publishing in Top-Tier Journals, Research Data Management, and Open Research Impact, facilitated by Prof Moinak Maiti, Wits University/ the Wits Libraries / Wits Open Data Vault Team; Maria Cotera, Figshare. Venue - NCB1
  - Introduction to Spatial Data Science, facilitated by Prof Inger Fabris-Rotelli, University of Pretoria. Venue - NCB2
  - Quantum Machine Learning and Data Science, facilitated by Dr Isaac Nape, Wits University. Venue - NCB3
- **16:00–16:30:** Workshop close, facilitator engagement, and informal networking. Venue - NCB3

Wednesday, 24 June 2026

Main Conference: Day One
Venue: Wits Science Stadium, West Campus, Braamfontein

- **08:00–08:30:** Delegate registration, breakfast tea, and morning networking.
- **08:30–08:45:** Master of Ceremony opening, announcements, and delegate orientation.
- **08:45–09:00:** Official Welcome to Wits by Professor Ian Jandrell (DVC - Wits).
- **09:00–09:40:** Keynote address by Professor Benjamin Rosman, *Africa's Role in the AI Race*, chaired by Dr Taariq Surtee.
- **09:45–10:45:** Parallel Scientific Sessions: Session 1 across all tracks.

- **10:45–11:15:** Morning tea and networking.
- **11:20–13:00:** Parallel Scientific Sessions: Session 2 across all tracks.
- **13:00–14:00:** Lunch and networking.
- **14:00–14:40:** Keynote address by Professor Maurice Radebe, *African Data Science For African Solutions: Data, Power And The Architecture Of African Futures*, chaired by Professor Costa Hofisi.
- **14:45–16:00:** Panel: *Governing African Data Science: Accountability, Sovereignty, and the Architecture of Responsible AI*, chaired and moderated by Dr Nomalanga Mashinini.
- **16:00–17:30:** Tea, posters, sponsor engagement, and networking.
- **17:30–20:30:** Data Science Hiring and Employability in Africa: *Skills, Careers, and the Future of Work*, hosted by the Wits Graduate Recruitment Programme and chaired by Dr Moses Phiri.

Thursday, 25 June 2026

Main Conference: Day Two
Venue: Wits Science Stadium, West Campus, Braamfontein

- **08:00–08:30:** Breakfast tea and morning networking.
- **08:30–08:40:** Master of Ceremony introduction, announcements, and Day Two orientation.
- **08:40–09:00:** Plenary Invited Paper: *Animated Biplot Visualisations of African Climate Patterns*, presented by Dr Raeesa Ganey and Dr Johané Nienkemper-Swanepoel.
- **09:00–09:40:** Keynote address by Professor Vukosi Marivate, *What Do Our Benchmarks Actually Measure? Evaluation Challenges for African Language AI*, chaired by Dr Sibusisiwe Makhanya.
- **09:45–10:45:** Parallel Scientific Sessions: Session 3 across all tracks.
- **10:45–11:15:** Morning tea and networking.
- **11:20–12:00:** Parallel Scientific Sessions: Session 4 across all tracks.
- **12:00–12:20:** Keynote speech by Professor Inger Fabris-Rotelli, *The Power of Where: How Spatial Data Science is Shaping African Research*.
- **12:20–13:00:** Industry Engagement Session: ISAZI Consulting, with Dario Fanucchi *(The Survivor's Guide to Being Human in the AI Revolution)* and Faeeza Lok *(Building at the Frontier: Culture Inside an AI Consulting Firm)*
- **13:00–14:00:** Lunch and networking.
- **14:00–14:40:** Keynote address by Professor Karin-Therese Howell, *Why Africa's Scientific Future Matters to the World: Mathematics, Data Science, and the Age of AI*.
- **14:45–16:00:** Panel: *Data Science Education in the Age of AI*, chaired by Dr Pravesh Ranchod.
- **16:00–17:30:** Tea and Tech Exhibition, including the AI, Data & Strategy Innovation Lounge sponsored by BI Technologies.
- **18:00–21:00:** Gala Dinner, featuring a keynote address by Professor Thokozani Majozi (President - Academy of Science of South Africa) and programme direction by Eleni Flack-Davison.

Friday, 26 June 2026

Main Conference: Day Three
Venue: Wits Science Stadium, West Campus, Braamfontein

- **08:00–08:30:** Breakfast tea and morning networking.
- **08:30–08:40:** Master of Ceremony introduction, announcements, and Day Three orientation.
- **08:40–09:00:** Plenary Session: *Adapting Curricula for the Rapid Evolution of Data Science*, presented by Professor Temesgen Zewotir.
- **09:00–09:20:** Plenary Invited Paper: *AI-Enabled Simultaneous Optimisation of Geological and Mineral Resource Models for Smarter Mining Operations*, presented by Professor Glen Nwaila.
- **09:20–09:40:** Plenary Invited Paper: *Evaluating Multimodal Large Language Model Diagnostic Performance at a Tertiary South African Hospital*, presented by Dr Michael Cameron Gramanie.
- **09:50–10:45:** Panel: *Emerging Advances in Data Science*, chaired by Professor Daniel Nicolas Wilke.
- **10:45–11:15:** Morning tea and networking.
- **11:20–13:00:** Panel: *AI for Business Transformation: From Experimentation to Scaled Impact*, chaired and facilitated by Professor Rennie Naidoo.
- **13:00–14:00:** Lunch and networking.
- **14:00–14:30:** Wits Closing Session and Prize Giving, with Professor Lynn Morris (DVC - Wits) and Professor Brett Bowman.
- **14:30–15:30:** Closing Keynote and Conference Close by Professor Loyiso Nongxa, *Mathematical Fraud Analytics*, chaired by Dr Farai Mlambo.
- **16:00–17:00:** Digital Dome experience as the special closing activity for the formal conference programme.

Saturday, 27 June 2026

Optional Post-Conference Activity

- **Saturday morning:** Optional Joburg Sightseeing Bus Tour sponsored by Joburg Tourism Company. Delegates may register for this optional post-conference activity, which will offer an opportunity to experience Johannesburg as one of Africa's major centres of history, culture, finance, innovation, and urban transformation. As places may be limited, preference will be given to delegates travelling from outside South Africa. Further logistical details, including the departure time, meeting point, capacity, cost if applicable, and registration arrangements, will be communicated during the conference.

5. POSTER PRESENTATIONS SCHEDULE

African Data Science Conference 2026

Poster presentation schedule across the five scientific themes and poster exhibition area

This section presents the ADSC 2026 poster presentation schedule. Posters provide a visual and interactive platform for delegates to engage directly with authors, discuss emerging research, explore methodological choices, and identify possible collaborations across the conference themes. The poster session is organised around the five ADSC 2026 scientific themes and will take place in the designated Poster Area.

Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations
Venue – WSS 1
Scientific Chairs – Prof Delson Chikobvu (University of the Free State), Raeesa Ganey (Wits University), and Dr Tsitsi Zengeya (University of KwaZulu-Natal)
Statistical modelling, mathematical and computational foundations, machine learning, deep learning, optimisation, simulation, computational artificial intelligence, natural language processing, speech technologies, large language models, multimodal AI, low-resource language modelling, and African language data systems.

Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Venue – WSS 2
Scientific Chairs – Prof Kennedy Otwombe (Wits University), Prof Raeesa Moolla (Wits University), and Prof Inger Fabris-Rotelli (University of Pretoria)
Health and public health data science, bioinformatics, geospatial analytics, environmental and climate data science, agricultural analytics, urban analytics, and sustainability-focused applications.

Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure
Venue – WSS 4
Scientific Chair – Dr Farai Mlambo (Wits University) and Prof Sunday Oladejo (Stellenbosch University)
Business analytics, financial and economic data science, organisational analytics, responsible AI, data governance, digital public infrastructure, cybersecurity, trust, and intelligent infrastructure.

Theme 4: Research Data Management, Open Data, Institutional Analytics, and Educational AI
Venue – WSS 5
Scientific Chairs – Dr Taariq Surtee, Eleni Flack-Davison and Lazarus Matizirofa (Wits University)

Research data management, open science, open data ecosystems, institutional analytics, learning analytics, educational artificial intelligence, and data-driven capacity-building.

Theme 5: Interdisciplinary Open Theme
Venue – WSS 3
Scientific Chairs – To be confirmed
This theme remains open at this stage. It provides space for interdisciplinary, emerging, cross-cutting, or late-breaking contributions that do not yet fall neatly within the assigned scientific themes. No papers have been assigned to this theme at this stage.

Poster presenters are expected to be available at their posters during the allocated poster session to discuss their work with delegates, reviewers, sponsors, industry guests, postgraduate students, and members of the wider ADSC community.

Wednesday 24 June

Poster Session: ADSC 2026 Posters

16:00–17:30 | Poster Area

Poster	Time	Theme	Poster Title	Presenter(s)
P.1 Submission 115	16:00–17:00	Theme 1 Stat/Comp/NLP	**AI for Scientific Integrity: Evaluating LLMs in Automated Critical Appraisal of Biomedical Research**	Kaela Kokkas
P.2 Submission 197	16:00–17:00	Theme 2 Health/Geo/Climate	**Machine Learning Enhanced Surveillance of HIV–TB Co-infection Using Routine Tuberculosis Laboratory Data in Nigeria**	Hassan Adam Murtala; Ibrahim Yusuf Ibrahim; Kasimu Mamuda; Aisha Adam Abdullahi; Dalhatu Abdullahi Aminu; Abubakar Muhammed Song; Yazeed Garba Bala; Abba Kasim Ibrahim; Mikhailu Suleman; Isiyaku Ahmadu; Muhammad Adamu Abbas; Abubakar Labaran Yusuf; Jordi B. Torrelles; Eknath Naik; Hamisu Mohammed Salihu
P.3 Submission 74	16:00–17:00	Theme 2 Health/Geo/Climate	**Stacked Ensemble Machine Learning Models for Predicting Post-Endoscopic Retrograde Cholangiopancreatography Pancreatitis in South Africa**	Adeboye Azeez; Sergio Vieira; Colin Noel
P.4 Submission 117	16:00–17:00	Theme 2 Health/Geo/Climate	**A Quantitative Analysis of Factors Influencing COVID-19 Vaccine Hesitancy in South Africa**	Lina Mohlala
P.5 Submission 118	16:00–17:00	Theme 2 Health/Geo/Climate	**Evaluating the Acceptability, Usability and Clinical Appropriateness of Your Path, an AI-Powered Tool Facilitating Relevant Access to HIV Services Post-HIV Self-Testing in South Africa**	Nomsa B. Mahlalela; Onthatile Maboa; Caroline Govathson; Laura Rossouw; Lawrence Long; Ross Greener; Sarah Morris; Shawna Cooper; Sasha Frade; Sophie Pascoe; Candice Chetty-Makkan
P.6 Submission 196	16:00–17:00	Theme 2 Health/Geo/Climate	**Integration of Sentinel-1 and Sentinel-2 for an Enhanced Land Use and Cover Mapping in Mountainous Regions**	Morena John Mapuru; Phumlani Zwane; Abuelgasim Musa; Mohamed A. M. Abd Elbasit
P.7 Submission 223	16:00–17:00	Theme 2 Health/Geo/Climate	**Modelling Tourist Arrivals to South Africa in the Presence of a Structural Break: COVID-19**	Musara Chipumuro
P.8 Submission 209	16:00–17:00	Theme 2 Health/Geo/Climate	**A Machine Learning Approach for Predicting Patient Length of Stay in Zimbabwean Public Hospital**	Maureen Dekete; Evangelista Tasiiwa Nyakujipa
P.9 Submission 23	16:00–17:00	Theme 4 RDM/Open Data	**Multicenter EMR-Based Prediction of Extubation Failure Using Time Series Measurements and Clinical Notes**	Eyob Mulugeta; Merga Belina; Awgichew Kifle; Menore Tekeba; Bisrat Derebssa; Hanan Yusuf
P.10 Invited Poster	16:00–17:00	Theme 2 Health/Geo/Climate	**Application of Artificial Intelligence and Machine Learning to Optimise Hydrogen Production in Underground Coal Gasification**	Tiny Ngobeni

P.11 Submission 108	16:00–17:00	Theme 2 Health/Geo/Climate	**A Virtual Museum Prototype for Archaeological Heritage in Benguela Province**	Jose Francisco de Oliveira; Jean-Pierre Caliste; Imaculada Quinda
P.12 Submission 192	16:00–17:00	Theme 2 Health/Geo/Climate	**The Impact of Spatial Connectivity Structures on Model Fit, Inference, and Data Integration in Spatial Epidemiology and Wastewater-Based Epidemiology: A Systematic Review**	Claris Siyamayambo; Inger Fabris-Rotelli
P.13 Submission 218	16:00–17:00	Theme 2 Health/Geo/Climate	**Adaptive Reinforcement Learning Ensemble Forecasting for High-Burden Disease in Africa**	Christopher Mvelase; Gugulethu Ncube
P.14 Submission 129	16:00–17:00	Theme 3 Business/Finance	**Optimising Socially Responsive Grid-Connected Hybrid Renewable Energy Systems: What Algorithm Behaviour Reveals**	Dhruti Dheda

6. SCIENTIFIC ORAL PRESENTATIONS SCHEDULE

African Data Science Conference 2026

Parallel oral presentation schedule across five scientific themes and assigned conference venues

This section presents the scientific oral presentation schedule for the five ADSC 2026 research themes. The sessions are organised as parallel tracks, with each track aligned to a designated scientific theme and venue. The structure is intended to help delegates identify presentations by theme, room, time slot, and session number, while also supporting movement between sessions where topics of interest cut across different areas of data science and artificial intelligence.

Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations
Venue – WSS 1
Scientific Chairs – Prof Delson Chikobvu (University of the Free State), Raeesa Ganey (Wits University), and Dr Tsitsi Zengeya (University of KwaZulu-Natal)
Statistical modelling, mathematical and computational foundations, machine learning, deep learning, optimisation, simulation, computational artificial intelligence, natural language processing, speech technologies, large language models, multimodal AI, low-resource language modelling, and African language data systems.

Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Venue – WSS 2
Scientific Chairs – Prof Kennedy Otwombe (Wits University), Prof Raeesa Moolla (Wits University), and Prof Inger Fabris-Rotelli (University of Pretoria)
Health and public health data science, bioinformatics, geospatial analytics, environmental and climate data science, agricultural analytics, urban analytics, and sustainability-focused applications.

Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure
Venue – WSS 4
Scientific Chair – Dr Farai Mlambo (Wits University) and Prof Sunday Oladejo (Stellenbosch University)
Business analytics, financial and economic data science, organisational analytics, responsible AI, data governance, digital public infrastructure, cybersecurity, trust, and intelligent infrastructure.

Theme 4: Research Data Management, Open Data, Institutional Analytics, and Educational AI
Venue – WSS 5

Scientific Chairs – Dr Taariq Surtee, Eleni Flack-Davison and Lazarus Matizirofa (Wits University)
Research data management, open science, open data ecosystems, institutional analytics, learning analytics, educational artificial intelligence, and data-driven capacity-building.

Theme 5: Interdisciplinary Open Theme
Venue – WSS 3
Scientific Chairs – To be confirmed
This theme remains open at this stage. It provides space for interdisciplinary, emerging, cross-cutting, or late-breaking contributions that do not yet fall neatly within the assigned scientific themes. No papers have been assigned to this theme at this stage.

Each oral presentation is allocated a 20-minute slot. Presenters should use this time efficiently, allowing space for a concise presentation and brief audience engagement where possible. Session chairs will support timekeeping, introduce speakers, manage transitions between presentations, and facilitate questions in line with the available time. Delegates are encouraged to consult the session numbers, presentation titles, authors, venues, and scientific themes carefully when planning their attendance. Although presentations are grouped by theme, many papers are interdisciplinary and may be relevant to delegates working across statistics, machine learning, artificial intelligence, health analytics, geospatial modelling, climate analytics, business analytics, governance, research data management, institutional analytics, educational AI, and interdisciplinary or emerging data science applications. Presentation times and room assignments may change as more presenters register for the conference. Delegates should therefore check the final printed programme, the ADSC 2026 Delegate Portal, on-site notices, and announcements from the organising team for the most up-to-date scheduling information.

Wednesday 24 June

Session 1: Oral Presentations

09:45–10:45

Session	Mins	Time	Track 1: WSS 1 Stat/Comp/NLP	Track 2: WSS 2 Health/Geo/Climat	Track 3: WSS 4 Business/Finance	Track 4: WSS 5 RDM/Open Data	Track 5: WSS 3 Interdisciplinary Open Theme

Session 1.1	20	09:45 - 10:05	**#63** Spatial Approximate Bayesian Bootstrap Imputation: Balancing Accuracy and Computation *Miguel Torres, Adam Sykulski and Miguel Torres*	**#17** Decadal Tropospheric Ozone Trends Assessment in Two Major Cities in South Africa: Implications for African Data Infrastructure– From Data Scarcity to Collaborations *Raeesa Moolla and Clinton Nyathi*	**#100** Multi-Horizon Volatility Forecasting of the JSE ALSI Using a Hybrid APARCH–LSTM Framework *Mulweli Netangula, Caston Sigauke and Thakhani Ravele*	**#7** Opportunities for Open Data Initiatives in Africa: Case Studies and Best Practices *Mary Mupemhi and Tariro R. Guta*	**#172** Advancing Fairness in Medical Imaging with CycleGAN-Based Synthetic Augmentation *Neville Modise, Pravesh Ranchod*
Session 1.2	20	10:05 - 10:25	**#91** An Attention-Weighted Random Forest Regressor for Dynamic Tree Contribution Modelling in Context-Aware Ensemble Learning *Martins Arasomwan*	**#26** Pandemic penalties and profitable misery: A decomposition and machine learning analysis of COVID-19 impacts inequalities in Gauteng, South Africa *Pedzisai Ndagurwa and Shamsunisaa Miles-Timotheus*	**#32** Hybrid Unsupervised Interpretable Forecast Error Analysis for Grid Risk Prioritisation in Low-Resource Environments *Makomane Dorothea Lawretta Sekhoto, Akihiro Fujii and Naoya Tanaka*	**#113** Computational Food Identity: A Multidimensional Data Model for Algorithmic Food Certification *Jean Franck Galliano*	*TBA (Something interesting will appear here!)*

Session 1.3	20	10:25 - 10:45	**#122** Teaching Machines to Respect Physics: A Framework for Integrating Scientific Machine Learning into Undergraduate CFD Education *Muaaz Bhamjee and Ken J. Craig*	**#46** AI-Driven Optimization of Informal Transport Networks Using Spatial Data Infrastructure: A Case Study of South African Minibus Taxi Systems *Limpho Letele*	**#70** From Access to Burden: A Diagnostic Framework for Trust in Service Delivery Systems *Kabiri Bule*	**#143** Staff Capacity and the Utilisation of Information Systems for Evidence-Based Decision Making in Tanzania's Public Sector *Bahati Ilembo, Edger P. Rutatola, Tupokigwe Isagah, Almasi S. Maguya, Irene Shubi Isibika, Elina C. Ntahomvukye, James Marandu, Lunodzo J. Mwinuka, Hoja Shilaba, Rajab Mgonja, Titus Mwisomba and Koen Stroeken*	*TBA (Something interesting will appear here!)*

Wednesday 24 June

Session 2: Oral Presentations

11:20–13:00

Session	Mins	Time	Track 1: WSS 1 Stat/Comp/NLP	Track 2: WSS 2 Health/Geo/Climat	Track 3: WSS 4 Business/Finance	Track 4: WSS 5 RDM/Open Data	Track 5: WSS 3 Interdisciplinary Open Theme
Session 2.1	20	11:20 - 11:40	**#124** Guided Weakly Supervised Machine Learning for Resonance Searches in High Energy Physics *Phodiso Maroeshe, Bruce Mellado, Edward Nkadimeng and Mukesh Kumar*	**#60** Improving Feature Representations for Few-Shot Classification of Neglected Tropical Diseases on Dark Skin Tones *Felix Obete, Ian Raymond Osolo and Michael-Ahile Terhemba*	**#162** Developing an Explainable and Responsible AI-Based Credit Scoring Framework for Financial Inclusion in Zimbabwe *Leonard Shambira*	**#151** Data Governance in the Digital Age: Assessing Institutional Readiness in Tanzania's Public Sector *Edger Rutatola, Tupokigwe Isagah, Bahati Ilembo, Irene Isibika, James Marandu, Hoja Shibala, Rajabu Mgonja, Lunodzo Mwinuka, Almasi Maguya and Koenraad Stroeken*	*TBA (Something interesting will appear here!)*

Session 2.2	20	11:40 - 12:00	**#195** Parametric Data Loading: A Zero-Shot Transfer Learning Framework for Sparse Retail Time Series in Emerging Markets *Tawonga Chikovore*	**#101** Enhancing Short-Term Wind Energy Forecasting with XGBoost and Conformal Prediction for Robust Uncertainty Quantification *Rabelani Innocent Nthangeni, Caston Sigauke and Thakhani Ravele*	**#99** A Hybrid Hidden Markov Model and XGBoost Approach to Volatility Modelling of the JSE Top 40 Index *Fhulufhedzani Justice Madega, Thakhani Ravele and Caston Sigauke*	**#225** Open Neuroinformatics Platforms and Data Governance Ecosystems in Africa: Towards Equitable, Ethical, and Sustainable Brain Data Science *Thamsanqa Hombana*	*TBA (Something interesting will appear here!)*
Session 2.3	20	12:00 - 12:20	**#217** Marikovia: Data-Efficient Physics-Informed Learning for Informal Economy Health in Gauteng *Owethu Mlambo*	**#61** Assessing the Utility of Over-the-Counter Medication to Track Influenza Season Timing in a South African Population *Malebo Makunyane, Neville Sweijd, Jhandre Bredenkamp, Sibongile Walaza, Jonny Peter and Cheryl Cohen*	**#102** A Comparative Analysis of Traditional Machine Learning and Deep Learning Techniques for Money Laundering Detection *Ronewa Nephiphidi and Ndivhuwo Ndou*	**#203** Contextual Mapping of the Wits AI Policy Development and Training Environment: Challenges and Opportunities *Marike Kluyts, Caryn Mcnamara, Tanya Coetzee and Eleni Flack-Davison*	*TBA (Something interesting will appear here!)*

Session 2.4	20	12:20 - 12:40	**#177** Quantifying Popularity Bias and User-Centric Fairness in Recommender Systems: A Cross-Domain Empirical Study *Cebo Mkhwanazi, Mandla Gwetu and Sunday Oladejo*	**#160** Applying Behavioural Science to AI Chatbot Design: A Usability Testing Methodology for WhatsApp-Based Healthcare *Kitso Setswe, Caroline Govathson, Ross Greener, Sophie Pascoe, Brendan Maughan-Brown, Lezanie Coetzee, Letitia Rambally-Greener, Ndumiso Madubela, Shawn Malone, Shawna Cooper and Candice Chetty-Makkan*	**#65** Forecasting Exchange Rate Using LSTM & VARX *Rofhiwa Nemudzivhadi*	**#176** Co-developing PAMHoYA Discovery: A South African Mental Health Data Discovery Framework Authors *Augustine Khumalo, Silas Formunyuy Verkijika, Trust Gangaidzo, Audrey Moyo, Lovemore Sigwadhi, Nataly Woollett, Vundli Ramokolo, Angel Maredi, Linda Mazibuko, Jason Bantjes, Donnela Besada, David Everatt, Bettina Moltrecht, Innocent Maposa and Dashini Govindasamy*	*TBA (Something interesting will appear here!)*

Session 2.5	20	12:40 - 13:00	**#178** Simulated Feedback Loops in Recommender Systems: Diversity, Popularity, and Content vs. Collaborative Retraining *Cebo Mkhwanazi, Mandla Gwetu and Sunday Oladejo*	**#180** Turning Routine Health Data into Decision Intelligence: Automating the District Health Barometer (DHB) *Ntombifuthi Blose, Matome Mokganya, Emanuel Dominic and Noluthando Ndlovu*	**#111** A Comparative Evaluation of Sequential and Tree-Based Machine Learning Models for Anti-Money Laundering Detection Using the SAML-D Synthetic Dataset *Humbulani Nekhumbe, Rimer Suvendi and Mpho Gololo*	**#214** Mapping Dispute Drivers in Public Infrastructure Projects: A Machine Learning Analysis of Uganda's Auditor General Reports from 2017 to 2025 *Charles Gavamukulya, Aurobindo Ogra and Clinton Aigbavboa*	*TBA (Something interesting will appear here!)*

Thursday 25 June

Session 3: Oral Presentations

09:45–10:45

Session	Mins	Time	Track 1: WSS 1 Stat/Comp/NLP	Track 2: WSS 2 Health/Geo/Climat	Track 3: WSS 4 Business/Finance	Track 4: WSS 5 RDM/Open Data	Track 5: WSS 3 Interdisciplinary Open Theme
Session 3.1	20	09:45–10:05	**#210** A Game-Theoretic Framework for Uplift Maximization in Two-Sided Marketplace Recommender Systems *Sunday Oladejo*	**#161** A Theoretical Framework for Smart Agriculture Systems Using AI and Data Science for Climate Resilience and Adaptation for Smallholder Farmers in Zimbabwe *Leonard Shambira*	**#84** Responsible AI and Data Governance in Africa: Readiness of Public-Sector Systems in Fragile Contexts *Abdulkadir Mohamed Gedi*	**#226** Understanding Municipal Concerns Using Large Language Models and Spatial Analysis *Michelle Madiba*	*TBA (Something interesting will appear here!)*
Session 3.2	20	10:05–10:25	**#13** Using Machine Learning to Predict the Adsorption of Antibiotic Drugs onto Functionalised Lignocellulosic Materials Derived from Sawdust *Ibrahim Chikowe and Muhammad D. Bala*	**#179** Analysing the African Air Transport Network Structure *Stefan Britz, Sebnem Er and David Snaddon*	**#219** Predicting M&A Success: A Machine Learning Approach *Lerato Mapela, Chimwemwe Chipeta and Moinak Maiti*	**#120** Whose IP Is It Anyway? An Ethical Look at Prompt Engineering in Algorithm Development *Taariq Gh Surtee*	*TBA (Something interesting will appear here!)*

Session 3.3	20	10:25–10:45	**#81** Refining Wastewater Surveillance through Regression Kriging: A Geostatistical Approach to Improve Spatial Prediction and Public Health Applications *Odey Mofokeng, Raeesa Manjoo-Docrat, Inger Fabris-Rotelli, Pravesh Debba, Jenny Holloway, Nontembeko Dudeni-Tlhone, Jabulani Jele, Wouter le Roux, Lisa Schaefer, Rene Stander and David Rose*	**#185** 1beat: Revolutionising Clinical Data Management in Resource-Limited Settings – A Public Sector Hospital Case Study *Rozett Phillips, Ziyaad Dangor, Jerome Loveland and Kendal Makgamathe*	**#167** Machine Learning and Deep Learning Approaches to Stock Market Prediction: Zimbabwe Stock Exchange (1994–2025) *Zibusiso Dube and Constantine Mupondo*	**#171** One Province, Two Cities, Three Realities: What a New Urban Surveillance Platform Reveals About Household Vulnerability in Gauteng *Eulender Mbetse and Sikelela Madonsela*	*TBA (Something interesting will appear here!)*

Thursday 25 June

Session 4: Oral Presentations

11:20–12:00

Session	Mins	Time	Track 1: WSS 1 Stat/Comp/NLP	Track 2: WSS 2 Health/Geo/Climat	Track 3: WSS 4 Business/Finance	Track 4: WSS 5 RDM/Open Data	Track 5: WSS 3 Interdisciplinary Open Theme

Session 4.1	20	11:20 - 11:40	**#144** Global Bias in Multimodal AI: A Cross-Architecture Evaluation of Vision-Language Models *Abass Oguntade, Ibukun Oduntan, Iremide Oyelaja, Chisom Chibuike and Tosin Adekunle*	**#220** A Causally Scaffolded Deep Learning for Sequential Clinical Decision Support in Sub-Saharan Africa *Albert Whata*	**#191** Normalising Flow Enhanced GARCH Models: A Two-Stage Framework for Flexible Innovation Modelling in Financial Time Series *Abdullah Hassan, Farai Mlambo and Wilson Tsakane Mongwe*	**#214** Mapping Dispute Drivers in Public Infrastructure Projects: A Machine Learning Analysis *Charles Gavamukulya*	*TBA (Something interesting will appear here!)*
Session 4.2	20	11:40 - 12:00	**#123** Parameter Recovery Properties of the Linear Mixed Model for Longitudinal Child Growth Analysis: A Monte Carlo Simulation Study in the PROMOTE Cohort *Mthobisi Mxolisi Zondi, Henry Godwell Mwambi, Fanta Sileshi Melesse and Nonhlanhla Yende-Zuma*	**#88** Predictive Synthesis-Properties Mapping Of Hydrothermally Developed Tio2-Go Nanocomposite For Seawater Electrolysis *Zainab Ibraheem, Maurice Onyango, Mokgadi Bopape and Ishmael Ramatsa*	**#211** Integrating Alternative Data and Machine Learning for Financial Forecasting: Evidence from South African REITs *Vukani Majozi*	**#187** Testing the Necessity of Rationality in Macroeconomic Dynamics *Lehlohonolo Moloi*	*TBA (Something interesting will appear here!)*

7. FULL CONFERENCE PROGRAMME

African Data Science Conference 2026

Workshops, Keynotes, Scientific Sessions, Panels, and Special Events

Programme Key

PLENARY | PANEL | SCIENTIFIC SESSIONS | SPECIAL SESSION | BREAK / ADMIN

PRE-CONFERENCE WORKSHOPS

Tuesday 23 June

08:00–08:30 **Registration / Breakfast Tea** — BREAK / ADMIN

Workshop delegate registration and morning tea.

08:30–09:00 **Welcome and Orientation - Dr Ndivhuwo Makondo** — BREAK / ADMIN

Welcome to pre-conference workshop delegates and facilitators. Orientation to workshop rooms, facilitators, and the structure of the day.

09:00–12:00 **Morning Parallel Half-Day Workshops** — SPECIAL SESSION

Workshop 1: Quantum Machine Learning and Data Science
Dr Isaac Nape, University of the Witwatersrand

Workshop 2: Machine Learning and Artificial Intelligence in Healthcare
Prof Innocent Maposa, Stellenbosch University; Dr Yusentha Balakrishna, Dr Isaac Singini, and Mr Siyabonga Mavundla, South African Medical Research Council

Workshop 3: Internet Connectivity and Computing as Enablers of Artificial Intelligence
Dr Songezo Soso Mata and the ICASA Team, Independent Communications Authority of South Africa

12:00–13:00 **Lunch** — BREAK / ADMIN

Workshop lunch and networking.

13:00–16:00 **Afternoon Parallel Half-Day Workshops** — SPECIAL SESSION

Workshop 4: From Data to Discovery: Publishing in Top-Tier Journals, Research Data Management, and Open Research Impact
Prof Moinak Maiti, University of the Witwatersrand; Maria Cotera, Figshare; and the Wits Libraries / Wits Open Data Vault Team

Workshop 5: Introduction to Spatial Data Science
Prof Inger Fabris-Rotelli, University of Pretoria

Workshop 6: Beyond Vibe Coding: Building Trustworthy Data Science with LLM Agents
Naweed Khan and Dr Ndivhuwo Makondo, IBM Research

16:00–16:30 **Workshop Close and Informal Networking** BREAK / ADMIN

Closing reflections, facilitator engagement, and informal networking among workshop delegates.

DAY ONE

Wednesday 24 June

08:00–08:30 **Registration / Breakfast Tea** BREAK / ADMIN

Delegate arrival, registration, and morning networking.

08:30–08:45 **Master of Ceremony – Opening** BREAK / ADMIN

Opening announcements, delegate orientation, and introduction to the day.

08:45–09:00 **Professor Ian Jandrell – Official Welcome to Wits** SPECIAL SESSION

Official Welcome to the African Data Science Conference 2026

Professor Ian Jandrell will formally welcome delegates, keynote speakers, presenters, panellists, workshop facilitators, sponsors, partners, exhibitors, postgraduate students, and invited guests to the University of the Witwatersrand for ADSC 2026. This opening welcome situates the conference within Wits University's broader commitment to research excellence, innovation, interdisciplinary collaboration, digital transformation, and public-impact scholarship. It also recognises the importance of convening African and international data science communities in Johannesburg to advance the conference theme, *African Data Science, for Africa*. The welcome will mark the formal start of the main conference programme and affirm Wits as a host institution committed to strengthening data science, artificial intelligence, postgraduate development, industry engagement, and responsible innovation across the continent.

09:00–09:40 **Keynote** KEYNOTE

Professor Benjamin Rosman
University of the Witwatersrand
Keynote title: *Africa's Role in the AI Race*
Session chair: Dr Taariq Surtee (Wits University)

09:45–10:45 **Parallel Scientific Sessions: Session 1 (All Tracks)** SCIENTIFIC SESSIONS

Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations
Venue – WSS 1
Scientific Chairs – Prof Delson Chikobvu (University of the Free State), Raeesa Ganey (Wits University), and Dr Tsitsi Zengeya (University of KwaZulu-Natal)

Statistical modelling, mathematical and computational foundations, machine learning, deep learning, optimisation, simulation, computational artificial intelligence, natural language processing, speech technologies, large language models, multimodal AI, low-resource language modelling, and African language data systems.

Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Venue – WSS 2
Scientific Chairs – Prof Kennedy Otwombe (Wits University), Prof Raeesa Moolla (Wits University), and Prof Inger Fabris-Rotelli (University of Pretoria)
Health and public health data science, bioinformatics, geospatial analytics, environmental and climate data science, agricultural analytics, urban analytics, and sustainability-focused applications.

Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure
Venue – WSS 4
Scientific Chair – Dr Farai Mlambo (Wits University) and Prof Sunday Oladejo (Stellenbosch University)
Business analytics, financial and economic data science, organisational analytics, responsible AI, data governance, digital public infrastructure, cybersecurity, trust, and intelligent infrastructure.

Theme 4: Research Data Management, Open Data, Institutional Analytics, and Educational AI
Venue – WSS 5
Scientific Chairs – Dr Taariq Surtee, Eleni Flack-Davison and Lazarus Matizirofa (Wits University)
Research data management, open science, open data ecosystems, institutional analytics, learning analytics, educational artificial intelligence, and data-driven capacity-building.

Theme 5: Interdisciplinary Open Theme
Venue – WSS 3
Scientific Chairs – To be confirmed
This theme remains open at this stage. It provides space for interdisciplinary, emerging, cross-cutting, or late-breaking contributions that do not yet fall neatly within the assigned scientific themes. No papers have been assigned to this theme at this stage.

10:45–11:15 **Tea** BREAK / ADMIN

Morning tea and networking.

11:20–13:00 **Parallel Scientific Sessions: Session 2 (All Tracks)** SCIENTIFIC SESSIONS

Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations
Venue – WSS 1
Scientific Chairs – Prof Delson Chikobvu (University of the Free State), Raeesa Ganey (Wits University), and Dr Tsitsi Zengeya (University of KwaZulu-Natal)
Statistical modelling, mathematical and computational foundations, machine learning, deep learning, optimisation, simulation, computational artificial intelligence, natural language processing, speech technologies, large language models, multimodal AI, low-resource language modelling, and African language data systems.

Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Venue – WSS 2
Scientific Chairs – Prof Kennedy Otwombe (Wits University), Prof Raeesa Moolla

(Wits University), and Prof Inger Fabris-Rotelli (University of Pretoria)
Health and public health data science, bioinformatics, geospatial analytics, environmental and climate data science, agricultural analytics, urban analytics, and sustainability-focused applications.

Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure
Venue – WSS 4
Scientific Chair – Dr Farai Mlambo (Wits University) and Prof Sunday Oladejo (Stellenbosch University)
Business analytics, financial and economic data science, organisational analytics, responsible AI, data governance, digital public infrastructure, cybersecurity, trust, and intelligent infrastructure.

Theme 4: Research Data Management, Open Data, Institutional Analytics, and Educational AI
Venue – WSS 5
Scientific Chairs – Dr Taariq Surtee, Eleni Flack-Davison and Lazarus Matizirofa (Wits University)
Research data management, open science, open data ecosystems, institutional analytics, learning analytics, educational artificial intelligence, and data-driven capacity-building.

Theme 5: Interdisciplinary Open Theme
Venue – WSS 3
Scientific Chairs – To be confirmed
This theme remains open at this stage. It provides space for interdisciplinary, emerging, cross-cutting, or late-breaking contributions that do not yet fall neatly within the assigned scientific themes. No papers have been assigned to this theme at this stage.

13:00–14:00 **Lunch** BREAK / ADMIN

Lunch and networking.

14:00–14:40 **Keynote** KEYNOTE

Professor Maurice Radebe
University of the Witwatersrand
Keynote title: *African Data Science for African Solutions: Data, Power and the Architecture of African Futures.*
Session chair: Professor Costa Hofisi (North West University)

14:40–14:45 **Transition** BREAK / ADMIN

Movement to the panel session.

14:45–16:00 **Panel: Governing African Data Science: *Accountability, Sovereignty, and the Architecture of Responsible AI*** PANEL

Chair and Moderator: Dr Nomalanga Mashinini (Wits University)

Panellists: *Prof Chux Daniels (University of Pretoria), Mr Meshack Shabalala (Massmart), Prof Geci Karuri-Sebina (Wits University), Prof Bhekinkosi Moyo (Wits University)*

This panel will examine the governance challenges facing African data science and artificial intelligence,

with particular attention to accountability, data sovereignty, responsible deployment, institutional capacity, and the political economy of AI governance. Convened under the ADSC 2026 theme of *African Data Science, for Africa*, the discussion will ask how African institutions, governments, researchers, corporations, funders, and universities can shape governance frameworks that are technically credible, socially responsible, and grounded in African priorities. The panel will address four connected themes: the meaning of data sovereignty in African contexts; accountability for AI systems deployed in high-stakes domains such as finance, retail, health, labour, and public services; the gap between governance frameworks on paper and governance practice in institutions; and the financing of African data and AI ecosystems at a time when traditional development funding is shifting. The discussion will also consider algorithmic accountability, data rights, large language models, human oversight, public participation, digital government, corporate responsibility, philanthropy, social investment, and the role of universities in producing data scientists who are also governance-literate. The session will include opening framing by the moderator, short thematic contributions from each panellist, moderated dialogue, audience questions, and closing reflections on the future of responsible AI and data governance in Africa.

16:00–17:30 **Tea, Posters, Sponsor Engagement, and Networking** BREAK / ADMIN

This session combines afternoon tea with poster viewing, informal discussion, sponsor engagement, and structured networking. Delegates are encouraged to visit the poster displays, engage directly with authors, ask questions about methods and findings, and provide constructive feedback to postgraduate students, early-career researchers, and presenting teams. The poster session provides an important space for deeper scientific exchange beyond the formal presentation rooms. It allows presenters to discuss their work in greater detail, explain methodological choices, reflect on data challenges, and identify possible extensions, collaborations, and publication opportunities. Delegates are encouraged to explore posters across all conference themes, including statistical and computational foundations, African language technologies, health and climate analytics, business and governance, research data management, and educational AI. This session also creates an opportunity for sponsors, partners, industry stakeholders, academics, students, and public-sector participants to connect informally. Conversations may focus on research translation, applied data science problems, postgraduate development, talent pipelines, technology adoption, responsible AI, and opportunities for future collaboration.

17:30–20:30 **Data Science Hiring and Employability in Africa: *Skills, Careers, and the Future of Work*** SPECIAL SESSION

Hosted by: Wits Graduate Recruitment Programme

Sponsored by: Old Mutual

Chair and Moderator: Dr Moses Phiri (NielsenIQ)

Opening and Welcome Remarks: Dr Farai Mlambo (Wits University), ADSC Chair

Sponsor and Industry Addresses: *Joshua Knight (Old Mutual) and Mabu Manaileng (Standard Bank)*

Panellists: *Jeremy Beukes (SAGEA / QuantifyYourFuture), Joanna Preston (FNB), Joshua Knight (Old Mutual), Mabu Manaileng (Standard Bank), Sibusisiwe Makhanya (IBM Research Africa), Lumengo Mngomezulu (Discovery), and Ikageng Mokwena (Eskom)*

A dedicated evening session hosted by the **Wits Graduate Recruitment Programme**, bringing together employers, recruiters, data science leaders, HR professionals, academics, students, graduates, professional bodies, funders, policymakers, and organisations interested in employability, internships, graduate recruitment, skills development, and African data science talent pipelines. The session will examine the state of data science employability in Africa and explore how universities, industry, government, professional bodies, and ecosystem stakeholders can work together to strengthen pathways from education to meaningful employment. Particular attention will be given to the gap

between academic preparation and workplace requirements, the skills and competencies most valued by employers, graduate recruitment, internships, experiential learning, mentorship, workplace readiness, and the future of work in an increasingly AI-driven economy. The evening will include registration and arrival networking, welcome remarks by the ADSC Chair, sponsor and industry insight presentations by Old Mutual and Standard Bank, a high-level panel discussion, audience question-and-answer engagement, closing reflections and a vote of thanks by Dr Moses Phiri, followed by a networking session. The discussion aims to generate practical, evidence-informed insights on how Africa can develop, support, retain, and connect world-class data science talent for the continent's digital future.

DAY TWO

Thursday 25 June

08:00–08:30 **Breakfast Tea** BREAK / ADMIN

Delegate arrival and morning networking.

08:30–08:40 **Master of Ceremony – Intro** BREAK / ADMIN

Daily orientation, announcements, and introduction to Day Two.

08:40–09:00 **Plenary Invited Paper: Animated Biplot Visualisations of African Climate Patterns** INVITED PAPER

Presenters: Dr Raeesa Ganey and Dr Johané Nienkemper-Swanepoel

This plenary invited paper presents animated biplot visualisation as a dynamic method for analysing African climate patterns. Using the `moveEZ` R package, which extends `biplotEZ`, the paper shows how principal component-based biplots can move beyond static displays to reveal how relationships among climate variables and regional profiles evolve over time. Demonstrated with ERA5 climate data across African regions, the approach enables researchers to visualise trajectories, detect changing multivariate patterns, and interpret regional differences in climate dynamics. The work highlights the value of dynamic visualisation for African climate adaptation, resilience planning, environmental monitoring, and data-driven climate research.

09:00–09:40 **Keynote** KEYNOTE

Professor Vukosi Marivate
University of Pretoria
Keynote title: *What Do Our Benchmarks Actually Measure? Evaluation Challenges for African Language AI.*
Session chair: Dr Sibusisiwe Makhanya (IBM Research Africa)

09:45–10:45 **Parallel Scientific Sessions: Session 3 (All Tracks)** SCIENTIFIC SESSIONS

Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations
Venue – WSS 1
Scientific Chairs – Prof Delson Chikobvu (University of the Free State), Raeesa Ganey (Wits University), and Dr Tsitsi Zengeya (University of KwaZulu-Natal)
Statistical modelling, mathematical and computational foundations, machine learning, deep learning, optimisation, simulation, computational artificial intelligence, natural language processing, speech technologies, large language models, multimodal AI, low-resource language modelling, and African language data systems.

Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Venue – WSS 2
Scientific Chairs – Prof Kennedy Otwombe (Wits University), Prof Raeesa Moolla (Wits University), and Prof Inger Fabris-Rotelli (University of Pretoria)

Health and public health data science, bioinformatics, geospatial analytics, environmental and climate data science, agricultural analytics, urban analytics, and sustainability-focused applications.

Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure
Venue – WSS 4
Scientific Chair – Dr Farai Mlambo (Wits University) and Prof Sunday Oladejo (Stellenbosch University)
Business analytics, financial and economic data science, organisational analytics, responsible AI, data governance, digital public infrastructure, cybersecurity, trust, and intelligent infrastructure.

Theme 4: Research Data Management, Open Data, Institutional Analytics, and Educational AI
Venue – WSS 5
Scientific Chairs – Dr Taariq Surtee, Eleni Flack-Davison and Lazarus Matizirofa (Wits University)
Research data management, open science, open data ecosystems, institutional analytics, learning analytics, educational artificial intelligence, and data-driven capacity-building.

Theme 5: Interdisciplinary Open Theme
Venue – WSS 3
Scientific Chairs – To be confirmed
This theme remains open at this stage. It provides space for interdisciplinary, emerging, cross-cutting, or late-breaking contributions that do not yet fall neatly within the assigned scientific themes. No papers have been assigned to this theme at this stage.

10:45–11:15 **Tea** BREAK / ADMIN

Morning tea and networking.

11:20–12:00 **Parallel Scientific Sessions: Session 4 (All Tracks)** SCIENTIFIC SESSIONS

Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations
Venue – WSS 1
Scientific Chairs – Prof Delson Chikobvu (University of the Free State), Raeesa Ganey (Wits University), and Dr Tsitsi Zengeya (University of KwaZulu-Natal)
Statistical modelling, mathematical and computational foundations, machine learning, deep learning, optimisation, simulation, computational artificial intelligence, natural language processing, speech technologies, large language models, multimodal AI, low-resource language modelling, and African language data systems.

Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Venue – WSS 2
Scientific Chairs – Prof Kennedy Otwombe (Wits University), Prof Raeesa Moolla (Wits University), and Prof Inger Fabris-Rotelli (University of Pretoria)
Health and public health data science, bioinformatics, geospatial analytics, environmental and climate data science, agricultural analytics, urban analytics, and sustainability-focused applications.

Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure
Venue – WSS 4
Scientific Chair – Dr Farai Mlambo (Wits University) and Prof Sunday Oladejo (Stellenbosch University)

Business analytics, financial and economic data science, organisational analytics, responsible AI, data governance, digital public infrastructure, cybersecurity, trust, and intelligent infrastructure.

Theme 4: Research Data Management, Open Data, Institutional Analytics, and Educational AI
Venue – WSS 5
Scientific Chairs – Dr Taariq Surtee, Eleni Flack-Davison and Lazarus Matizirofa (Wits University)
Research data management, open science, open data ecosystems, institutional analytics, learning analytics, educational artificial intelligence, and data-driven capacity-building.

Theme 5: Interdisciplinary Open Theme
Venue – WSS 3
Scientific Chairs – To be confirmed
This theme remains open at this stage. It provides space for interdisciplinary, emerging, cross-cutting, or late-breaking contributions that do not yet fall neatly within the assigned scientific themes. No papers have been assigned to this theme at this stage.

12:00–12:20 **Keynote Speech** KEYNOTE

Professor Inger Fabris-Rotelli
University of Pretoria
Keynote title: *The power of where: How Spatial Data Science is Shaping African Research*
Session chair: Prof Raeesa Moolla (Wits University)

12:20–13:00 **Industry Engagement Session: ISAZI Consulting** SPECIAL SESSION

Presenters: Dario Fanucchi and Faeeza Lok

Dario Fanucchi
ISAZI Consulting
Presentation title: The Survivor's Guide to Being Human in the AI Revolution

Dario Fanucchi will reflect on ISAZI Consulting's journey as an applied AI firm built on mathematics, deep technical expertise, and original thinking. His talk examines how the rapid acceleration of AI is reshaping the work of data scientists, AI engineers, and technical teams. While AI models can now inspect data, generate code, and support complex analytical workflows, the talk argues that deep expertise matters more than ever. Human judgement, mathematical thinking, domain understanding, problem selection, system design, evaluation, and taste remain central to building trustworthy and useful AI systems. Drawing on ISAZI's experience in forecasting, education, document automation, and agentic optimisation, the talk will explore what human-centred data science means in an era of increasingly capable AI models. It will also offer practical reflections for students, early-career researchers, and professionals seeking to build meaningful and resilient careers in AI and data science in 2026 and beyond.

Faeeza Lok
Marketing & Brand Specialist – People & Culture, ISAZI Consulting
Presentation title: Building at the Frontier: Culture Inside an AI Consulting Firm

This industry engagement session features ISAZI Consulting as one of the conference's industry partners. The session will provide delegates with insight into the work, culture, and applied AI consulting environment of a leading AI-focused firm. Through contributions from Dario Fanucchi and Faeeza Lok, the session will highlight ISAZI's approach to building at the frontier of artificial intelligence, its organisational culture, and the practical realities of working in an AI consulting firm today. The engagement will be particularly valuable for students, early-career researchers, and professionals

interested in understanding how advanced analytics, machine learning, and artificial intelligence are translated into real-world business and industry solutions.

Keywords: AI consulting; applied artificial intelligence; human-centred data science; technical expertise; agentic optimisation; organisational culture; data science careers; business transformation.

13:00–14:00 **Lunch** BREAK / ADMIN

Lunch and networking.

14:00–14:40 **Keynote** KEYNOTE

Professor Karin-Therese Howell
AIMS South Africa and Stellenbosch University
Keynote title: *Why Africa's Scientific Future Matters to the World: Mathematics, Data Science, and the Age of AI*
Session chair: Professor Delson Chikobvu (University of the Free State)

14:40–14:45 **Transition** BREAK / ADMIN

Movement to the panel session.

14:45–16:00 **Panel: Data Science Education in the Age of AI** PANEL

Chair: Dr Pravesh Ranchod (Wits University)

Panellists: *Johann Myburgh (Standard Bank), Dr Peter Olukanmi (University of Johannesburg), Prof Inger Fabris-Rotelli (University of Pretoria), and Prof Temesgen Zewotir (University of KwaZulu-Natal)*

Data science education stands at a crossroads. The rapid rise of artificial intelligence tools has transformed not only what we teach, but also how we teach it. These tools offer unprecedented opportunities for personalised instruction, automated feedback, scalable academic support, and expanded access to data science learning. At the same time, they are disrupting traditional approaches to assessment, curriculum design, and student evaluation. When a language model can complete a typical coding, data analysis, or modelling assignment in seconds, educators must rethink what is being assessed, what counts as evidence of learning, and how students can demonstrate genuine understanding. This panel brings together perspectives from across the data science education landscape to examine how curricula, pedagogy, assessment, and training pathways must evolve in response to these changes. At the heart of the discussion is a deeper question: what should a data scientist actually know? The profession increasingly includes practitioners who can skilfully use powerful tools without necessarily engaging deeply with the mathematics, statistics, computer science, and domain knowledge that underpin them. Yet it is precisely this foundational understanding that enables data scientists to recognise when tools fail, when results mislead, when assumptions break down, and when automated outputs require critical scrutiny. The panel will explore how educators can balance accessibility, employability, and practical skills with rigour, depth, and conceptual foundations. It will also consider what level of abstraction is appropriate for different learners, career paths, and institutional contexts. Through this conversation, panellists will debate how African universities and training institutions can prepare the next generation of data scientists for a field being reshaped by AI, automation, and the changing demands of the future of work.

16:00–17:30 **Tea, Tech Exhibition** SPECIAL SESSION

Including the AI, Data & Strategy Innovation Lounge sponsored by BI Technologies

The Tech Exhibition will showcase practical data science, AI, analytics, business intelligence, and digital innovation solutions. The session is designed as an open innovation space where conference delegates, technology companies, start-ups, innovation hubs, public-sector innovation teams, research laboratories, university innovation units, student teams, and digital entrepreneurs can interact, demonstrate solutions, and explore possible collaborations. This session will also feature the *AI, Data & Strategy Innovation Lounge*, powered by BI Technologies Africa. The Lounge will provide an interactive platform for practical engagement around AI adoption, data-driven decision-making, strategy execution, benefits realisation, KPI development, performance management, and technology-enabled business transformation. Participants will have an opportunity to engage with experts, entrepreneurs, researchers, industry partners, and innovation ecosystem actors through advisory conversations, demonstrations, networking, and live discussion. The Tech Exhibition session will be free to African tech start-ups and entrepreneurs, subject to registration and space availability. As part of the activation, BI Technologies Africa will sponsor a Strategy Development and Execution Workshop valued at R500,000. This is not a cash prize, but a facilitated strategy engagement intended to support the selected organisation in clarifying strategic priorities, defining measurable outcomes, developing KPIs, and building a practical execution roadmap.

18:00–21:00 **Gala Dinner** SPECIAL SESSION

The Gala Dinner will provide a formal evening platform for networking, relationship-building, and celebration of the African Data Science Conference community. It will bring together keynote speakers, delegates, sponsors, partners, researchers, practitioners, students, entrepreneurs, and invited guests in a relaxed setting that encourages conversation beyond the formal conference sessions. The evening will also recognise the contribution of partners and participants who are helping to advance data science, AI, analytics, and digital innovation across Africa. The Gala Dinner will feature a keynote by *Professor Thokozani Majozi* (Advisor – ADSC 2026, Chairman and President – Academy of Science of South Africa, ASSAf, Deputy Vice-Chancellor: Research and Internationalisation – University of Cape Town), who will contribute to the evening's reflections on science, innovation, research excellence, and the future of African knowledge systems. The evening will also include a special address by *Ziaad Suleman* (Chief Executive Officer – Cassava Technologies South Africa and Botswana), who will speak on digital innovation, technology leadership, and the role of data and AI in shaping Africa's digital future. The programme will be directed by *Eleni Flack-Devision* (University of the Witwatersrand) as Master of Ceremonies.

Venue to be confirmed.

DAY THREE

Friday 26 June

08:00–08:30 **Breakfast Tea** BREAK / ADMIN

Delegate arrival and morning networking.

08:30–08:40 **Master of Ceremony – Intro** BREAK / ADMIN

Daily orientation, announcements, and introduction to Day Three.

08:40–09:00 **Plenary Session: Adapting Curricula for the Rapid Evolution of Data Science** PLENARY

Speaker: Professor Temesgen Zewotir (University of KwaZulu-Natal)

This plenary session examines how academic institutions must adapt data science curricula in response to the rapid evolution of data analytics, artificial intelligence, machine learning, and computational infrastructure. As organisations across sectors increasingly embed data science capabilities to collect, integrate, process, and interpret large, complex, and heterogeneous data streams, the demand for analytically skilled graduates continues to grow. The challenge for universities is no longer simply to teach data collection or technical tools, but to prepare graduates who can extract strategic meaning, work with complex corporate data architectures, and translate analytical insight into organisational and societal value. Professor Temesgen Zewotir will reflect on the implications of this fast-changing landscape for curriculum design, statistical training, postgraduate education, and industry relevance. The session will consider how data science both draws from and extends statistical science, creating a productive relationship between foundational statistical thinking and modern computational practice. Rather than viewing data science as an existential threat to traditional statistics, the plenary will position it as a powerful opportunity to make advanced statistical methodologies more visible, impactful, and practically valuable in contemporary decision-making environments. The discussion will speak directly to African higher education institutions seeking to build responsive, rigorous, and future-facing data science programmes that balance statistical foundations, computational skills, machine learning, responsible AI, business relevance, and the talent pipeline required for Africa's data-driven future.

09:00–09:20 **Plenary Invited Paper: AI-Enabled Simultaneous Optimisation of Geological and Mineral Resource Models for Smarter Mining Operations** INVITED PAPER

Presenter: Professor Glen Nwaila

African Research Centre for Ore Systems Science (CORES), School of Geosciences, University of the Witwatersrand, Johannesburg, South Africa

This plenary invited paper presents an AI-enabled framework for the simultaneous optimisation of geological and mineral resource models for smarter mining operations. The presentation focuses on the use of variational Gaussian processes as a scalable probabilistic modelling approach for spatially distributed geological and mineral resource variables under uncertainty. Drawing on polymetallic deposit case studies, the paper demonstrates how AI-enabled modelling can strengthen uncertainty quantification, data fusion, model updating, resource confidence assessment, drilling prioritisation, mine planning, blending, processing, and value optimisation. The broader contribution is a movement beyond sequential estimation workflows towards integrated, uncertainty-aware, and operationally connected orebody intelligence.

Keywords: Artificial intelligence; variational Gaussian processes; mineral resource modelling; geological modelling; polymetallic deposits; uncertainty quantification; orebody intelligence.

09:20–09:40 **Plenary Invited Paper: Evaluating Multimodal Large Language Model Diagnostic Performance at a Tertiary South African Hospital**

INVITED PAPER

Presenter: Dr Michael Cameron Gramanie

South African Medical Research Council Vaccines and Infectious Diseases Analytics Research Unit, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

This plenary invited paper presents the VALID study, a retrospective evaluation of ten frontier multimodal large language models for diagnostic performance across 539 inpatient cases at a tertiary public hospital in Johannesburg, South Africa. The paper examines how multimodal inputs, including radiology images, laboratory results, clinical narratives and vital signs, can support diagnostic reasoning in internal medicine and paediatrics. Using a calibrated LLM Jury aligned to expert clinician ratings, the study assesses diagnostic accuracy, differential diagnosis quality, clinical reasoning and patient safety. The findings highlight the potential of multimodal LLMs as supervised diagnostic-support tools in African public hospital settings, while emphasising the importance of local validation, affordability, documentation quality, input constraints, safety risks, governance and clinician oversight.

09:45–09:50 **Transition** BREAK / ADMIN

Movement to the Advances in Data Science panel.

09:50–10:45 **Panel: Emerging Advances in Data Science** PANEL

Chair: Professor Daniel Nicolas Wilke (University of the Witwatersrand)

Panellists: *Dr Obakeng Moepya (Isazi Consulting), John Mukomberanwa (Standard Bank), Dr Mark Nasila (FNB), Dr Lebohang Mashatola (IBM Research Africa), and Dominique de Wet (Hatch)*

This panel brings together perspectives from quantum computing, machine learning, control and automation, banking, industry research, engineering, consulting, and academia to discuss emerging advances in data science. The aim is not to force these perspectives to converge, but to allow them to converse. Each panellist will offer an authentic and sector-grounded view of how data science is changing their field, where its promise is strongest, and where its risks, constraints, and implementation challenges are most visible. The discussion will explore how different sectors adopt new data science methods in different ways, shaped by their opportunities, organisational cultures, regulatory environments, technical infrastructures, responsibilities, and tolerance for risk. In doing so, the panel will position data science as a shared field that is constantly being reshaped by distinct sector realities, from frontier research and optimisation to AI-enabled decision-making, automation, financial services, industrial systems, and real-world deployment.

10:45–11:15 **Tea** BREAK / ADMIN

Morning tea and networking.

11:20–13:00 **Panel: AI for Business Transformation: *From Experimentation to Scaled Impact*** PANEL

Chair and Facilitator: Professor Rennie Naidoo (Wits University)

Panellists: *Prof Rutendo Hwindingwi (Wits Business School), Prof Josef Langerman (University of*

Johannesburg), Nkae Mocumi (Absa), Asif Valley (Microsoft)

Artificial intelligence has moved rapidly from a specialist technical concern to a strategic priority for business leaders, managers, entrepreneurs, professionals, and policymakers. Many organisations are experimenting with generative AI, machine learning, automation, predictive analytics, and AI-enabled decision support, yet many still struggle to move beyond pilots and proofs of concept. This academia-industry panel will explore how organisations can translate AI experimentation into scaled, measurable, and sustainable business transformation. The discussion will consider why many AI initiatives fail to scale, what distinguishes successful AI adoption from isolated experimentation, and what leadership capabilities, data foundations, skills, operating models, organisational structures, and change management practices are needed to embed AI into core business processes. The panel will also examine how firms can measure productivity, performance, and business value created by AI, and what lessons can be drawn from sectors such as financial services, consulting, telecommunications, retail, healthcare, and professional services. The session will close by reflecting on how business schools can prepare managers and executives to lead AI-enabled transformation in an increasingly data-driven economy.

13:00–14:00 **Lunch** BREAK / ADMIN

Lunch and networking.

14:00–14:30 **Wits Closing Session and Prize Giving** SPECIAL SESSION

Wits Closing Session: Professor Lynn Morris (DVC - Wits)
University of the Witwatersrand

Prize Giving: Professor Brett Bowman
University of the Witwatersrand

This closing plenary session brings ADSC 2026 to a formal close through institutional reflections from the University of the Witwatersrand, followed by the recognition of outstanding contributions made during the conference. Professor Lynn Morris will offer closing reflections on the significance of ADSC 2026 as a platform for African-centred data science, responsible artificial intelligence, postgraduate development, interdisciplinary collaboration, and industry engagement. The session will acknowledge the collective work of keynote speakers, plenary speakers, invited presenters, authors, panellists, workshop facilitators, reviewers, session chairs, sponsors, partners, exhibitors, student representatives, volunteers, and delegates who contributed to the success of the conference. It will also reflect on the role of Wits University in convening communities across academia, industry, government, professional bodies, and innovation ecosystems to advance the conference theme, *African Data Science, for Africa*. The Prize Giving, led by Professor Brett Bowman, will recognise excellence across selected conference categories, including outstanding posters, oral presentations, postgraduate contributions, and other notable achievements identified through the ADSC 2026 programme. The session will celebrate scholarly quality, methodological rigour, practical relevance, communication, originality, and the contribution of emerging African data science talent. Together, the Wits Closing Session and Prize Giving will provide a moment of reflection, appreciation, celebration, and transition, closing ADSC 2026 while pointing towards future collaboration, continued research exchange, and the strengthening of Africa's data science and AI ecosystem.

14:30–15:30 **Closing Keynote and Conference Close** KEYNOTE

Professor Loyiso Nongxa
University of the Witwatersrand
Keynote title: *Mathematical Fraud Analytics*
Session chair: Dr Farai Mlambo (Wits University)

16:00–17:00 **Digital Dome Experience** SPECIAL SESSION

Delegates are invited to attend the **Digital Dome experience** as a special closing activity for the formal conference programme. This immersive experience will provide a memorable and inspiring close to ADSC 2026, connecting data, technology, space, visualisation, and public science communication in a unique setting. The activity is intended to encourage informal engagement, networking, and reflection beyond the formal scientific sessions. Further logistical details, including meeting points, capacity, and registration arrangements, will be communicated during the conference.

Saturday morning **Optional Joburg Sightseeing Bus Tour** SPECIAL SESSION

Delegates may also register for an optional **Joburg Sightseeing Bus tour** on Saturday morning, sponsored by Joburg Tourism Company. The tour will offer delegates an opportunity to experience Johannesburg as one of Africa's major centres of history, culture, finance, innovation, and urban transformation. This activity is intended to provide an informal and memorable post-conference experience, combining cultural engagement, networking, and appreciation of the city beyond the conference venue. As places may be limited, **preference will be given to delegates travelling from outside South Africa**. Further logistical details, including the departure time, meeting point, capacity, cost if applicable, and registration arrangements, will be communicated during the conference.

8. DELEGATE INFORMATION AND ETIQUETTE

Conference Etiquette and Practical Guidance

Registration	Delegates should collect their conference badges and materials at the registration desk. Registration times and desk location will be confirmed in the final venue guide.
Name badges	Delegates are requested to wear their name badges throughout the conference for access control, networking, catering, exhibitions, and session identification.
Wi-Fi	Wi-Fi access details will be provided at registration and through official conference communication channels.
Meals	Tea, coffee, and lunch will be provided according to the official programme. Delegates with dietary requirements should ensure these are communicated through the registration process.
Accessibility	Delegates requiring accessibility support should contact the organising team as early as possible. The conference will make reasonable efforts to support inclusive participation.
Photography	Photography may take place during the conference for communication and archival purposes. Delegates who do not wish to be photographed should notify the registration or help desk.
Security	Delegates should follow campus access instructions, wear badges visibly, and comply with venue and security guidance. Personal belongings remain the responsibility of each delegate.
Lost and found	Lost items should be reported to the help desk. Found items should also be handed to the help desk for safekeeping.
Professional conduct	Delegates are expected to engage respectfully during sessions, panels, workshops, exhibitions, networking events, online forums, and portal-based interactions.

9. VENUE MAP AND ROOM GUIDE

Wits Science Stadium, Digital Dome, WiFi Access, Maps, and Drop-Off Points

Wits is an eduroam-enabled campus. Delegates are encouraged to ensure, before arriving at the conference, that they can access eduroam through their home institution. Venue direction boards, Google Maps links, QR codes, conference signage, and official ADSC 2026 announcements will support delegate navigation between the main conference venue, workshop rooms, Digital Dome, registration area, exhibition spaces, catering areas, and drop-off points.

WiFi Access and Venue Navigation

WiFi access: Wits is an eduroam-enabled campus. Please ensure that your eduroam login is active and working through your home institution before travelling to the conference.

Main campus map: For a link to the Wits Braamfontein Campus map, please visit:

$$https://www.wits.ac.za/maps/braamfontein-campus/$$

ADSC 2026 Conference Venue

Google Maps link to the conference venue

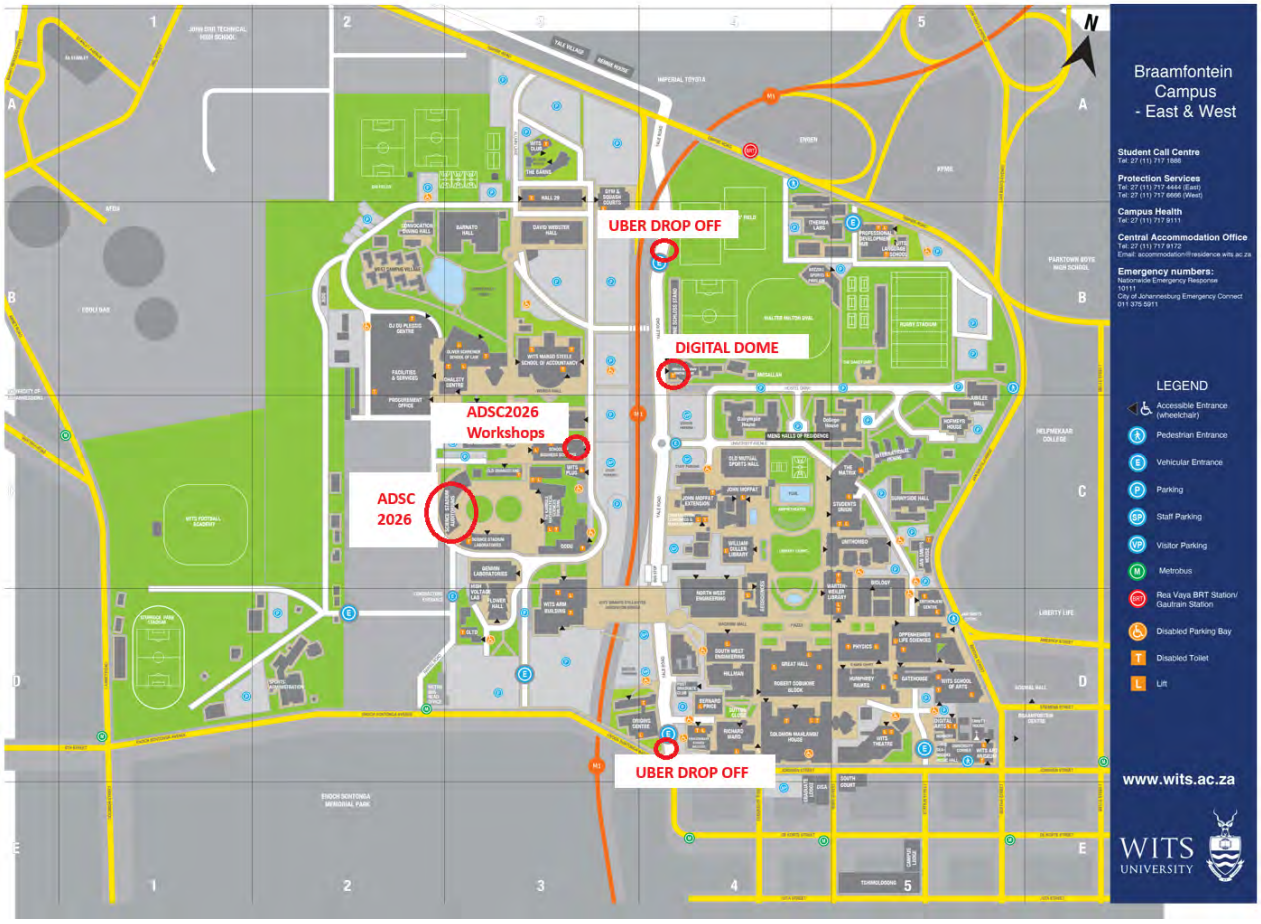
Digital Dome

Google Maps link to the Digital Dome

Delegates should use the QR codes above, the official Wits campus map, and on-site direction boards to navigate to the relevant conference venues and activities.

Map of Venues and Drop-Off Points

The map below indicates the main ADSC 2026 venues, workshop location, Digital Dome, and suggested Uber drop-off points. Delegates should follow conference signage and official announcements for any final updates to access routes, registration points, and room allocations.



WiFi access	Wits is an eduroam-enabled campus. Delegates should ensure that they can access eduroam from their home institution before arriving at the conference.
Main campus map	The Wits Braamfontein Campus map is available at: https://www.wits.ac.za/maps/braamfontein-campus/.
Main conference venue	The Google Maps link to the ADSC 2026 conference venue is: https://maps.app.goo.gl/ZZKK3XaApqrsQLMWA. Delegates may also scan the conference venue QR code.
Digital Dome	The Google Maps link to the Digital Dome is: https://maps.app.goo.gl/PwBbseWBY81vyryaA. Delegates may also scan the Digital Dome QR code.
Venue map	A map of the venues and drop-off points is included in this guide. Delegates should use the map together with on-site signage and official ADSC 2026 announcements.
Drop-off points	Suggested Uber drop-off points are indicated on the venue map. Delegates should confirm the most convenient drop-off point based on their destination, including the main conference venue, workshop rooms, or Digital Dome.

Direction boards	Venue direction boards will guide delegates between registration, plenary spaces, parallel rooms, exhibition areas, catering points, workshop rooms, and key meeting points.
Registration desk	Delegates should collect badges and conference materials at the registration desk. The exact registration point will be indicated through signage and official ADSC 2026 announcements.
Help desk	The help desk will assist with programme queries, venue directions, lost and found, delegate support, and navigation between conference spaces.
Workshop rooms	Pre-conference workshops will take place on Tuesday, 23 June 2026. Workshop participants should use the shared Google Maps links, QR codes, venue map, signage, and workshop-specific communication for navigation.

10. PRESENTER GUIDELINES

Oral Presentations, Posters, Panels, Workshops, and Session Chairs

Oral Presenters

- Please arrive at your assigned room at least 10 minutes before the start of your session. Bring a copy of your presentation on a USB flash drive
- Presentation timing will be confirmed in the final programme. Presenters should prepare to keep strictly to the allocated time.
- Slides should be prepared using the templates provided on the conference's website **https://www.wits.ac.za/media/wits-university/conferences/adsc/documents/ADSC2026-presenter-template.pptx**.
- Presenters should check the compatibility of slides, fonts, videos, and embedded content before the session begins.
- Where possible, presentation files should be submitted or tested in advance according to instructions from the organising team.
- Please respect the session chair and timekeeper, particularly during transitions and Q&A.

Poster Presenters

- Posters should be prepared using the templates provided on the conference's website **https://www.wits.ac.za/media/wits-university/conferences/adsc/documents/ADSC2026-poster-template.pptx**.
- Poster presenters should mount posters during the designated setup window.
- Presenters may be required to stand by their posters during official viewing and judging periods.
- Posters should communicate the research question, method, data, results, contribution, and relevance clearly.
- Poster prizes may consider originality, clarity, methodological quality, visual presentation, and contribution to African data science.

Panel Speakers

- Panel speakers should arrive at least 10 minutes before the panel begins.
- Please respect the moderator's timing guidance and contribute concisely.
- Panels are intended to encourage lively, respectful, and inclusive discussion.
- Speakers should connect their contributions to the theme and audience of ADSC 2026.

Workshop Facilitators

- Facilitators should check room setup, projection, audio, internet, and participant requirements before the workshop begins.

- Workshop materials should be prepared in advance and shared with participants where appropriate.
- Workshops should balance conceptual explanation, practical engagement, and participant interaction.
- Please keep to the workshop schedule and communicate any technical needs to the organising team.

Session Chairs

- Introduce each speaker briefly and keep the session on schedule.
- Confirm pronunciation of names and institutional affiliations where possible.
- Manage Q&A fairly and inclusively.
- Handle absent presenters professionally and avoid unnecessary delays.
- Report technical or scheduling issues to the organising team.

11. SESSION CHAIR AND TIMEKEEPER INSTRUCTIONS

Supporting Smooth Scientific Sessions

Session chairs and timekeepers play an important role in maintaining the quality, fairness, and flow of the scientific programme. Their work helps protect session timing, support presenters, enable meaningful discussion, and ensure that delegates can move smoothly between parallel sessions, panels, tea breaks, lunch, posters, and plenary events.

Before the session	Arrive early, confirm the presenter order, check pronunciation of names where possible, and ensure that presentation files and equipment are ready.
Opening the session	Welcome delegates, introduce the session theme, explain timing, and remind presenters of the allocated presentation and Q&A time.
Timekeeping	Keep presentations on schedule. Provide clear time signals and close discussions politely when time has elapsed.
Q&A	Encourage concise questions, manage participation fairly, and ensure a respectful academic tone.
Absent presenters	Do not allow delays to disrupt the full session. Follow the final guidance from the organising team for absent presenters.
Technical issues	Alert technical support or the organising team immediately. If necessary, adjust the session flow while preserving fairness.
Closing	Thank speakers and delegates, remind participants of the next programme item, and end on time.

12. ADSC 2026 PRIZES AND AWARDS

Celebrating Excellence, Impact, and Emerging Data Science Talent

African Data Science Conference 2026

The ADSC 2026 Prizes and Awards recognise outstanding scholarly contributions, excellent communication, methodological rigour, African-centred innovation, postgraduate achievement, and meaningful applications of data science and artificial intelligence. The awards are intended to celebrate not only technical excellence, but also clarity of thought, relevance to African challenges, responsible innovation, and the ability to translate data-driven work into scientific, institutional, business, public-sector, and societal value. Awards will be announced during the official Prize Giving session, subject to final confirmation by the Scientific Committee and Local Organising Committee. Some categories may be consolidated, expanded, or withheld where appropriate, depending on the final programme, number of eligible contributions, and judging outcomes.

PRIZES AND AWARDS

ADSC 2026 Award Categories

1

Best Overall Oral Presentation

Scientific Excellence Award

Recognises	The strongest overall oral presentation delivered at ADSC 2026, across all scientific themes. This award recognises work that combines a clear research question, strong methodological execution, compelling results, and excellent scholarly communication.
Indicative criteria	Originality; methodological rigour; clarity of presentation; strength of contribution; quality of evidence; response to questions; relevance to the conference theme, **African Data Science, for Africa**.

2

Best Postgraduate Oral Presentation

Emerging Scholar Award

Recognises	An outstanding oral presentation delivered by a postgraduate student. This award celebrates emerging African data science talent and recognises students who demonstrate scholarly maturity, technical competence, confidence, and the ability to communicate complex ideas clearly.
Indicative criteria	Research quality; conceptual clarity; methodological soundness; presentation confidence; quality of visual material; ability to explain significance; engagement with audience questions.

3

Best Poster Presentation

Research Communication Award

Recognises	The poster that most effectively communicates its research contribution in a visually clear, intellectually coherent, and engaging manner. This award recognises the poster as a serious scholarly format for discussion, feedback, and research visibility.
Indicative criteria	Visual design; clarity of research question; structure; methodological transparency; quality of results; accessibility to interdisciplinary delegates; relevance and originality.

4

Best Postgraduate Poster

Postgraduate Research Visibility Award

Recognises	An outstanding poster presented by a postgraduate student. This prize recognises early-stage and emerging researchers who use the poster format to communicate their work with clarity, confidence, and scholarly promise.
Indicative criteria	Student ownership of the work; clarity of explanation; poster design; methodological awareness; ability to discuss the research; contribution to African data science conversations.

5

Best Methodological Contribution

Data Science Methods Award

Recognises	A paper or presentation that makes a strong methodological contribution to statistics, machine learning, artificial intelligence, optimisation, modelling, computation, or data science foundations.
Indicative criteria	Technical depth; novelty; mathematical or computational rigour; reproducibility; clarity of assumptions; potential for broader use across data science applications.

6

Best Applied Data Science Contribution

Impact and Translation Award

Recognises	A contribution that demonstrates strong application of data science, machine learning, artificial intelligence, statistical modelling, or analytics to a real-world problem in business, health, education, finance, governance, environment, infrastructure, or society.

Indicative criteria	Practical relevance; quality of implementation; stakeholder value; contextual understanding; evidence of impact; responsible interpretation; potential for translation into decision-making or policy.

7

Best African-Centred Data Science Contribution

African Data Science, for Africa Award

Recognises	A contribution that most strongly reflects the ADSC 2026 theme by engaging with African data, African challenges, African institutions, African languages, African contexts, or African development priorities.
Indicative criteria	Depth of African contextual relevance; use of local data or locally grounded problem framing; contribution to African knowledge systems; societal significance; ethical and responsible engagement.

8

Responsible AI and Data Governance Award

Ethics, Trust, and Public Value Award

Recognises	A contribution that advances responsible, trustworthy, ethical, fair, transparent, or accountable use of data science and artificial intelligence. This may include work on governance, law, policy, algorithmic accountability, bias, privacy, security, or public-interest technology.
Indicative criteria	Ethical depth; governance relevance; conceptual clarity; contribution to responsible AI practice; attention to risks and harms; practical relevance for African institutions and communities.

9

Best Health, Climate, or Sustainable Development Analytics Contribution

Data Science for Public Good Award

Recognises	A contribution that applies data science, statistical modelling, machine learning, geospatial analytics, bioinformatics, or AI to health, climate, environment, agriculture, sustainability, public health, or development challenges.
Indicative criteria	Public-good relevance; methodological strength; data quality; contextual sensitivity; potential contribution to policy, planning, health systems, environmental resilience, or sustainable development.

10

Best Industry, Innovation, or Digital Transformation Contribution

Applied Innovation Award

Recognises	A contribution that demonstrates how data science, analytics, artificial intelligence, or digital technologies can support organisational innovation, business transformation, financial intelligence, operational improvement, or industry-facing decision-making.
Indicative criteria	Innovation value; business or institutional relevance; implementation feasibility; strategic insight; analytical quality; potential to support transformation and measurable organisational impact.

11

Best Student Representative Contribution

Service, Leadership, and Conference Citizenship Award

Recognises	A recognition for outstanding contribution by an ADSC 2026 Student Representative. This award celebrates student leadership, professionalism, reliability, delegate support, teamwork, and contribution to the smooth running of the conference.
Indicative criteria	Professionalism; initiative; teamwork; reliability; delegate engagement; support for sessions and logistics; positive contribution to the conference environment.

12

Conference Chair's Commendation

Special Recognition Award

Recognises	A discretionary recognition for exceptional contribution to ADSC 2026. This may acknowledge extraordinary scholarly service, institutional support, partnership-building, postgraduate mentorship, programme contribution, or behind-the-scenes work that significantly strengthens the conference.
Indicative criteria	Exceptional contribution; service to the conference; leadership; collegiality; impact on delegate experience; contribution to the broader ADSC 2026 mission.

Prize Giving Session

Indicative timing	Friday, 26 June 2026, during the official Prize Giving session. Final timing will be confirmed in the detailed programme.
Award process	Awards may be informed by poster judging, session-chair feedback, reviewer input, Scientific Committee recommendations, and Local Organising Committee confirmations.
Eligibility	Eligibility will depend on presentation format, delegate status, postgraduate status where applicable, and final programme participation.

Recognition	Awardees may receive certificates, public acknowledgement during the conference, mention in post-conference communication, and recognition through official ADSC 2026 platforms, subject to final arrangements.
Final note	The organising team reserves the right to refine award names, combine categories, or withhold awards where no suitable contribution is identified.

ADSC 2026 celebrates excellence, service, innovation, and the next generation of African data science leadership.

13. PROCEEDINGS AND FULL-PAPER PATHWAYS

Scholarly Publication Opportunities

ADSC 2026 is supporting three distinct scholarly publication pathways for selected high-quality work presented at the conference. These include a conference proceedings outlet, selected special issue journal opportunities, and an edited Springer book volume. Each pathway will have its own scope, editorial process, submission requirements, review criteria, and publication timeline. Acceptance for presentation at ADSC 2026 does not automatically guarantee inclusion in any publication outlet.

1. Conference proceedings	Selected full papers presented at ADSC 2026 may be considered for inclusion in the official conference proceedings pathway. This outlet will be edited by the ADSC 2026 Conference Editorial Team and will focus on high-quality full papers that align with the conference themes. All submissions will be subject to peer review, editorial approval, formatting requirements, publisher requirements, and final quality checks.
Proceedings eligibility	The proceedings pathway will be linked to accepted work that is presented at ADSC 2026. Authors will be invited to submit full papers or extended versions of their conference contributions, following the official proceedings guidelines to be communicated after the conference.
Proceedings review	Submitted papers will be reviewed for originality, methodological quality, clarity, relevance, ethical compliance, contribution to knowledge, and alignment with the scientific and applied focus of ADSC 2026.
2. Special issue journals	ADSC 2026 will also support selected journal special issue opportunities for suitable papers. These opportunities will be coordinated with **Prof. David Mhlanga**, an ADSC 2026 Editorial Member and member of the Scientific Committee. The special issue pathways will be particularly relevant for papers on sustainability, Industry 5.0, digital transformation, artificial intelligence, machine learning, business analytics, responsible AI, circular economy, development, health, and related applied domains.
Special issue scope	Potential special issue outlets may include journal collections and special issues focusing on themes such as AI and sustainability, Industry 5.0 and sustainable development, industrial AI, digital transformation, AI-enabled healthcare, wearable technologies, inclusive innovation, and sustainable business transformation. Authors will be guided towards the most appropriate outlet based on the scope and quality of their papers.
Special issue review	Submission to a special issue journal does not guarantee acceptance. Papers will be handled according to the policies, peer-review procedures, author guidelines, publication ethics requirements, article processing charges, and editorial decisions of the relevant journal or publisher.

3. Edited Springer book volume	In addition to the conference proceedings and special issue journal opportunities, ADSC 2026 is supporting a book publication pathway for selected high-quality full papers presented at the conference. Authors may be invited to submit extended versions of their work for consideration in an edited volume provisionally titled *Statistics/ML/AI in Action for Sustainable Development*.
Expected publisher	The book is expected to be published by Springer in mid-2027 as part of the ICSA Book Series in Statistics.
Book focus	The volume will focus on the role of statistical modelling, machine learning, and artificial intelligence in generating actionable evidence to advance the Sustainable Development Goals. It will promote research and real-world innovation at the intersection of Statistics, ML, AI, and sustainable development.
Book scope	The book will welcome contributions from research and applications across fields including statistics, epidemiology, engineering, health and medicine, economics, the natural and social sciences, agriculture, environmental sciences, and related applied domains. Contributions should be grounded in statistical, ML, or AI methodologies and should clearly demonstrate an application to one or more SDGs.
Book editors	**Prof. Najmeh Nakhaeirad**, University of Pretoria, South Africa; and **Prof. Ding-Geng Chen**, University of Pretoria, South Africa, and Arizona State University, Phoenix, USA.
Important note	Presentation at ADSC 2026 does not imply automatic acceptance into the conference proceedings, special issue journals, edited book volume, or any associated publication outlet. All papers remain subject to peer review, editorial decision, publisher approval, formatting requirements, publication ethics checks, and final quality assessment.
Further communication	Detailed submission deadlines, templates, formatting instructions, copyright requirements, article processing charge information where applicable, and submission procedures will be communicated separately for each publication pathway.

14. REGISTRATION, FEES, AND INCLUSIONS

Delegate Registration Guidance

Registration link	https://adsconference.witsevents.co.za/register
Registration includes	Access to registered conference sessions, daytime tea and coffee, lunch during the main conference days, and official delegate activities included in the programme, subject to registration category.
Registration excludes	Accommodation, travel, airport transfers, personal expenses, and activities not explicitly included in the registration category.
Workshops	Pre-conference workshops may require separate registration or selection, subject to capacity and final registration arrangements.
Gala dinner	The Gala Dinner may be included in selected categories or charged separately, depending on the registration option. Delegates should consult the official registration page.
Payment and invoicing	Payment and invoice support will be coordinated through the official registration and conference administration channels.
Support contact	Contact Wits Enterprise at conferences.witsenterprise@wits.ac.za.
Important note	Delegates should consult the official registration page for the latest fees, deadlines, payment instructions, and category-specific inclusions.

15. CODE OF CONDUCT

Responsible and Respectful Conference Participation

ADSC 2026 is committed to providing a respectful, inclusive, intellectually open, and professionally responsible environment for all delegates. The conference welcomes participants from diverse disciplines, institutions, sectors, countries, career stages, and professional communities.

Respectful engagement	Delegates should engage with one another in a collegial and respectful manner during sessions, panels, workshops, exhibitions, networking events, and portal-based interactions.
Anti-harassment	Harassment, intimidation, discrimination, bullying, or exclusionary behaviour will not be tolerated.
Academic debate	Robust scholarly debate is encouraged, provided it is conducted with professionalism, fairness, and respect for differing perspectives.
Inclusive participation	Delegates should support inclusive participation, particularly for students, early-career researchers, first-time presenters, and participants from underrepresented communities.
Responsible use of AI	Delegates should use AI and digital tools responsibly, transparently, and in ways that respect privacy, intellectual property, and academic integrity.
Portal conduct	Messaging, meetups, forums, and delegate directory features should be used professionally and only for appropriate conference-related engagement.
Privacy	Delegates should not share private contact details, photographs, recordings, or personal information without consent.
Reporting	Concerns should be reported to the organising team or designated help desk. A final reporting pathway will be confirmed before the conference.

16. ACCESSIBILITY AND INCLUSION

Building an Inclusive African Data Science Community

ADSC 2026 seeks to create an inclusive environment that supports participation across disciplines, institutions, countries, career stages, and professional communities. The theme **African Data Science, for Africa** requires not only technical excellence, but also a commitment to access, dignity, fairness, and meaningful participation.

Accessibility needs	Delegates requiring accessibility support should communicate their needs to the organising team as early as possible.
Dietary requirements	Dietary requirements should be submitted through the registration process or communicated through official conference channels.
Inclusive language	Delegates are encouraged to use respectful and inclusive language in presentations, panels, questions, discussions, and online engagement.
Student support	Students and early-career researchers are important members of the ADSC 2026 community. Delegates are encouraged to support constructive feedback, mentorship, and welcoming engagement.
Diversity of disciplines	The conference welcomes statisticians, computer scientists, engineers, business scholars, health researchers, geospatial scientists, policy scholars, industry professionals, and other communities contributing to data science.

17. EXHIBITOR AND SPONSOR ENGAGEMENT

Technology, Innovation, Industry, and Partnership

The ADSC 2026 Tech Exhibition and sponsor engagement spaces are designed to connect research, technology, innovation, graduate employability, industry practice, and institutional partnership. Delegates are encouraged to visit exhibitor spaces, engage with sponsors, explore tools and platforms, and discuss opportunities for collaboration.

Tech Exhibition	The Tech Exhibition is scheduled for Thursday, 25 June 2026.
Location	The Exhibition location is within the Wits Science Stadium.
Delegate engagement	Delegates may engage with technology companies, start-ups, innovation hubs, research laboratories, institutional partners, student teams, and public-sector innovation teams.
Industry conversations	The exhibition supports conversations around data science tools, AI applications, analytics platforms, digital infrastructure, graduate recruitment, internships, and applied research.
Sponsor booths	Sponsors and partners may use exhibition spaces to showcase products, initiatives, research collaborations, career opportunities, and innovation programmes.
Employability link	The exhibition complements the Data Science Hiring and Employability in Africa session by connecting talent, employers, professional bodies, and training institutions.

18. SOCIAL MEDIA AND COMMUNICATION GUIDE

Sharing ADSC 2026 Responsibly

Delegates are encouraged to share their ADSC 2026 experience through professional and respectful communication. Social media posts can help amplify African data science, promote scholarly exchange, celebrate postgraduate work, and strengthen networks across academia, industry, policy, and innovation.

Official Hashtags

#ADSC2026 #AfricanDataScience #AI #DataScience #WitsUniversity

Conference website	https://www.wits.ac.za/adsc2026/
Conference platform	https://africandatascienceconference.com/
LinkedIn	https://www.linkedin.com/company/african-data-science-conference/
Posting guidance	Delegates are encouraged to tag the official conference page, acknowledge speakers and co-authors appropriately, and share highlights responsibly.
Photography consent	Please respect privacy and do not post identifiable images of other delegates without appropriate consent, particularly in small-group or informal settings.

19. JOHANNESBURG VISITOR INFORMATION

Delegate Travel, City Orientation, and Practical Guidance

Johannesburg is one of Africa's most important centres of finance, research, innovation, culture, entrepreneurship, and urban transformation. ADSC 2026 welcomes delegates to experience the city not only as a conference location, but also as a dynamic African knowledge and innovation environment.

Airport access	Airport-to-Wits travel guidance will be shared with registered delegates closer to the conference. Delegates should plan sufficient travel time from OR Tambo International Airport or Lanseria International Airport.
Transport	Delegates are encouraged to use reputable transport services, hotel transfers, or ride-hailing services. Group transport details, where applicable, will be communicated officially.
Accommodation	Recommended accommodation areas and partner options have been shared through official conference communication channels.
Safety	Delegates should follow standard city safety practices, travel in groups where appropriate, avoid displaying valuables, and follow guidance from hotels, hosts, and conference organisers.
Weather	June in Johannesburg is typically dry and cool, especially in the mornings and evenings. Delegates are encouraged to bring warm clothing.
Nearby services	Information on nearby restaurants, cafés, pharmacies, and other services may be added in the final version of the programme.
Sightseeing	Sightseeing registration details, route, capacity, and logistics will be confirmed and communicated to registered delegates.
Acknowledgement	ADSC 2026 gratefully acknowledges Joburg Tourism Company for supporting the Johannesburg delegate experience.

20. DELEGATE PORTAL GUIDELINES

African Data Science Conference 2026

Connect, plan, network, and engage through the ADSC 2026 Delegate Portal

The **ADSC 2026 Delegate Portal** has been developed to enhance the conference experience before, during, and after the event. The portal provides delegates with a digital space to manage their conference profile, explore the programme, save sessions, connect with other delegates, request meetings, exchange messages, and participate in moderated discussion forums.
The portal is designed to support a richer and more connected conference experience. While the official conference programme, registration records, and formal communication channels remain authoritative, the Delegate Portal provides an interactive layer for planning, networking, collaboration, and community-building. Delegates are encouraged to use the portal actively and responsibly as part of their ADSC 2026 participation.

DELEGATE PORTAL

What You Can Do

Dashboard	View your conference command centre, registration sync status, saved sessions, meeting requests, unread messages, and personalised schedule information.
My Profile	Update your delegate information, upload a profile photo, confirm your professional category, add your organisation, include a LinkedIn or website link, and manage privacy preferences.
Programme Planner	Browse the conference programme, filter by date, save sessions of interest, avoid scheduling clashes, and export selected sessions to your personal calendar using the calendar export function.
Delegate Directory	Discover other delegates who have opted into the directory. Search by name, institution, country, or professional interest, and view available delegate profiles.
Meetups	Request coffee chats, collaboration meetings, sponsor conversations, or informal networking engagements during available conference windows. Recipients may accept, suggest a new time, or decline.
Messages	Exchange direct messages with delegates who have enabled messaging. Conversations should remain professional, respectful, and relevant to the conference.
Forum	Participate in moderated discussion spaces for announcements, session questions, workshops, collaborations, student engagement, industry and career conversations, and general conference interaction.
Installable App	Use the portal as an installable progressive web app on mobile devices for convenient access to schedules, check-in support, meetup coordination, and conference updates.

ACCESSING THE PORTAL

Conference Digital Platform

Delegates can access the ADSC 2026 digital platform through the dedicated conference website and Delegate Portal. The platform is intended to support registered delegates as well as broader members of the ADSC community who wish to engage with conference updates, networking opportunities, and selected digital features.

Dedicated conference website: https://africandatascienceconference.com/
Delegate Portal: https://app.africandatascienceconference.com/

For the best experience, delegates are encouraged to complete their profile before arriving at the conference, install the portal as a mobile app where possible, and check the platform regularly for updates, saved sessions, meeting requests, messages, and announcements.

USING THE PORTAL

Recommended Delegate Workflow

Before the conference

- Log into the ADSC 2026 Delegate Portal and confirm that your registration status is correctly synced.
- Complete your profile by adding your name, affiliation, country, professional category, profile photo, and optional professional links.
- Decide whether you would like to appear in the delegate directory and whether you wish to allow direct messages or meeting requests.
- Browse the programme and save the sessions, panels, workshops, exhibitions, and special events that you plan to attend.
- Export your selected schedule to your personal calendar if you would like a mobile-friendly reminder system.

During the conference

- Use the programme planner to keep track of sessions, venues, panels, workshops, poster sessions, exhibitions, and special events.
- Use the delegate directory to identify possible collaborators, research contacts, industry partners, postgraduate peers, and professional networks.
- Request meetups during networking windows, tea breaks, poster sessions, exhibitions, or other appropriate conference intervals.
- Use the forum to ask session-related questions, follow official announcements, and continue discussions that emerge from presentations and panels.
- Check messages regularly if you have enabled direct messaging.

After the conference

- Use the portal to follow up with new contacts, collaborators, potential supervisors, research partners, employers, sponsors, and professional networks.
- Continue selected conversations through the forum or direct messages where appropriate.

- Use your saved schedule as a record of the sessions, panels, workshops, and networking engagements you attended.

PRIVACY AND PROFESSIONAL CONDUCT

Responsible Use of the Portal

Visibility	Delegates control whether they appear in the directory. Only delegates who opt in will be visible to others.
Email visibility	Delegates may choose whether their email address is displayed in the directory. Email visibility should be enabled only where the delegate is comfortable being contacted directly.
Messaging	Direct messaging is consent-based. Delegates should only use messaging for professional, academic, conference-related, or networking purposes.
Meeting requests	Meeting requests should be respectful, specific, and reasonable. Delegates are free to accept, suggest another time, or decline.
Forum conduct	Forum discussions should remain collegial, constructive, inclusive, and relevant to ADSC 2026. The forum is a professional conference space and may be moderated.
Profile information	Delegates should ensure that profile information is accurate, professional, and appropriate for a scholarly and professional conference environment.
Official communication	The portal supports conference engagement, but it does not replace official ADSC 2026 communication channels, registration confirmation, payment records, or formal programme updates.

21. VENUE AND SPECIAL EXPERIENCE

African Data Science Conference 2026

ADSC 2026 will be hosted at the Wits Science Stadium, University of the Witwatersrand, Johannesburg. The venue provides an academic setting for scientific exchange, interdisciplinary engagement, postgraduate development, industry participation, and networking across the African data science community. The programme also includes a special closing experience at the Wits Digital Dome / Planetarium. This experience is intended to provide delegates with a memorable conclusion to the conference, connecting science, technology, imagination, and informal networking in one of Wits University's distinctive public-facing scientific spaces.

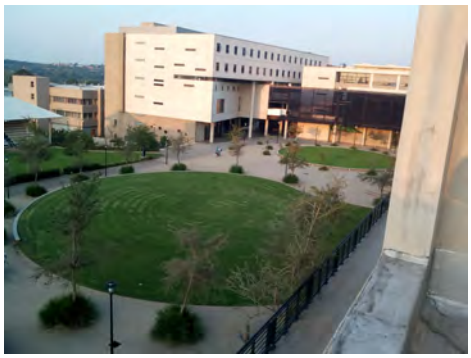
CONFERENCE VENUE

Wits Science Stadium



Wits Science Stadium

Conference venue for ADSC 2026, University of the Witwatersrand, Johannesburg.



Wits Science Stadium

A central academic space for scientific sessions, panels, workshops, and delegate engagement.

SPECIAL CLOSING EXPERIENCE

Wits Digital Dome / Planetarium



Wits Digital Dome

Special closing experience and informal networking opportunity for ADSC 2026 delegates.



Wits Digital Dome

A distinctive Wits science and public-engagement space connecting technology, imagination, and discovery.

22. CONFIRMED KEYNOTE VOICES

African Data Science Conference 2026

Across science, technology, innovation, leadership, and African-centred data science

ADSC 2026 brings together leading voices across data science, artificial intelligence, statistics, mathematics, innovation, institutional leadership, business, public policy, research management, and public-interest technology. The confirmed speakers reflect the breadth and ambition of the conference theme, **African Data Science, for Africa**, by connecting technical excellence with social relevance, institutional leadership, ethical responsibility, and the continent's digital future. The speaker programme has been curated to showcase both depth and diversity. It includes scholars and leaders whose work spans foundational mathematics, statistical science, machine learning, artificial intelligence, spatial data science, financial technology, digital transformation, research innovation, AI governance, data science education, and African language technologies. Their collective expertise highlights the interdisciplinary nature of contemporary data science and the importance of building bridges between theory, application, policy, and practice. A defining feature of ADSC 2026 is its commitment to positioning African knowledge systems, African data realities, African institutions, and African development priorities at the centre of the conversation. The keynote speakers, institutional leaders, panel chairs, workshop facilitators, and invited contributors bring perspectives that are globally informed, yet deeply attentive to the opportunities and challenges of the African context. Through their contributions, ADSC 2026 invites delegates to think critically about how data science and artificial intelligence can strengthen health systems, support inclusive finance, advance climate and environmental intelligence, improve education, enhance public-sector decision-making, protect digital rights, build responsible innovation ecosystems, and develop the next generation of African researchers, practitioners, and leaders. This section introduces the voices whose scholarship, leadership, and practical experience will help shape the conference's intellectual direction. Together, they demonstrate that African data science is not only a technical field but also a strategic, ethical, institutional, and societal project.

KEYNOTE SPEAKERS

Confirmed Keynote Voices

ADSC 2026 is honoured to feature keynote voices whose work spans mathematics, artificial intelligence, data science, business leadership, statistical science, and mathematical capacity-building in Africa. Together, these speakers reflect the conference theme, **African Data Science, for Africa**, by connecting scholarly excellence, institutional leadership, technological innovation, and societal relevance.

- **Prof Loyiso Nongxa**: Professor Emeritus, University of the Witwatersrand; former Vice-Chancellor and Principal of Wits University; former Vice-President of the International Mathematical Union.
- **Prof Maurice Radebe**: Faculty Director, Commerce, Law and Management, University of the Witwatersrand; Adjunct Professor, Wits Business School; former Head and Director of Wits Business School.
- **Prof Benjamin Rosman**: Professor, School of Computer Science and Applied Mathematics, University of the Witwatersrand; Founding Director, Wits MIND Institute; founder of RAIL Lab and

Lelapa AI.

- **Prof Inger Fabris-Rotelli**: Professor, Department of Statistics, University of Pretoria; Scientific Committee Chair, ADSC 2026; immediate past President of the South African Statistical Association.
- **Prof Vukosi Marivate**: Professor of Computer Science, University of Pretoria; ABSA-UP Chair of Data Science; Founding Director, African Institute for Data Science and Artificial Intelligence.
- **Prof Karin-Therese Howell**: Executive Director, AIMS South Africa; Associate Professor in Mathematics, Stellenbosch University.



Prof Loyiso Nongxa

ADSC 2026 Keynote Speaker

University of the Witwatersrand

Prof Loyiso G. Nongxa is an eminent South African mathematician, higher education leader, and Professor Emeritus at the University of the Witwatersrand. He is also Honorary Professor at the University of Pretoria and Extraordinary Professor at the University of the Western Cape. He retired as Ad Hominem Professor of Mathematics at Wits University in December 2018, after 18 years of service to the institution. From 2000 to 2013, Prof Nongxa served on the Senior Executive Team of Wits University. He was Deputy Vice-Chancellor for Research from 2000 to 2002, and later served as Vice-Chancellor and Principal from 2003 to 2013. He also served as Chairperson of the National Research Foundation of South Africa from 2014 to 2018 and was appointed by the Minister of Higher Education and Training as Administrator of the University of Fort Hare from April 2019 to April 2020. Prof Nongxa attended the University of Oxford as a Rhodes Scholar and obtained his doctorate in Mathematics in 1982. Prior to this, he studied at the University of Fort Hare, where he completed undergraduate degrees in Mathematics and Mathematical Statistics, as well as an MSc in Mathematics. His academic career has included teaching appointments at the National University of Lesotho, the former University of Natal in Durban, the University of the Western Cape, and the University of the Witwatersrand. His earlier research interests were in group theory, while his more recent scholarly interests include the mathematical foundations of data science and machine learning. He has also been one of the champions of a National Graduate Academy for Mathematical and Statistical Sciences, an initiative focused on developing the next generation of mathematicians and statisticians in South Africa. Internationally, Prof Nongxa was elected as one of the two Vice-Presidents of the International Mathematical Union at its Annual General Meeting in São Paulo in 2018, serving from 2019 to 2022. In this role, he served as the liaison person between the International Mathematical Union and UNESCO, as well as with the International Science Council. In July 2024, Prof Nongxa was awarded an Honorary Doctor of Science by the University of the Witwatersrand in recognition of his exemplary contribution and longstanding commitment to the mathematical sciences. The University of Johannesburg has also announced that it will confer an Honorary Doctorate on him on 29 May 2026, in recognition of his distinguished contribution to mathematics and higher education leadership in South Africa and beyond. As an ADSC 2026 keynote speaker, Prof Nongxa brings a profound perspective on mathematics, data science, higher education leadership, postgraduate capacity development, and the long-term importance of strengthening mathematical and statistical sciences for Africa's scientific future.



Prof Maurice Radebe

ADSC 2026 Keynote Speaker

University of the Witwatersrand

Prof Maurice Radebe is Faculty Director of Commerce, Law and Management at the University of the Witwatersrand. He previously served as Head and Director of Wits Business School and as Executive Vice President responsible for Sasol's global Energy Business. In that role, he oversaw the successful marketing of energy products globally and managed major gas-to-liquids and gas-to-power ventures in Qatar, Nigeria, and Mozambique. A highly accomplished energy industry executive, Prof Radebe has more than 30 years of experience spanning Shell, Exel, and Sasol. Across these roles, he developed deep expertise in both the upstream and downstream energy sectors, with significant responsibility for strategy, operations, profitability, restructuring, and market development. He played a leading role in navigating periods of oil price volatility, driving major business transformation, cost optimisation, and performance improvement initiatives. His experience extends across South Africa and several international markets, including Mozambique, Nigeria, Uzbekistan, and Qatar. He has also engaged extensively with governments, regulators, and commercial organisations, and made history as the first person to serve twice as Chairman of the South African Petroleum Industry Association (SAPIA), including during the 2010 FIFA World Cup. Prof Radebe is widely recognised for his strategic leadership, ability to align organisations around purpose, and commitment to execution. Throughout his career, he has built and led diverse, high-performing teams, while mentoring and coaching many emerging leaders. Since joining Wits Business School as Executive in Residence in 2013, Prof Radebe has played an important role in bridging business practice and academic leadership. He has contributed to the development of energy-focused teaching and executive education, including supporting the establishment of the African Energy Leadership Centre and the energy leadership programmes now offered by Wits Business School. Prof Radebe is also the Founder and Chairman of the Unleashing Leadership Potential Foundation (ULP) in South Africa. He is deeply committed to education, leadership development, gender equality, and the socio-economic transformation of South Africa and the African continent. He continues to invest his time and resources in empowering young people with the skills needed for personal and professional success. He holds a BSc in Applied Mathematics and Physics from the University of the North, a Management Advancement Programme from Wits Business School, and an MBA from Wits Business School. He also completed the General Management Programme at Harvard Business School. Prof Maurice Radebe brings to ADSC 2026 a rare combination of industry depth, strategic insight, and an enduring commitment to leadership, education, and Africa's development.



Prof Benjamin Rosman

ADSC 2026 Keynote Speaker

University of the Witwatersrand

Prof Benjamin Rosman is a Professor in the School of Computer Science and Applied Mathematics at the University of the Witwatersrand, South Africa, where he leads the Robotics, Autonomous Intelligence and Learning Laboratory. In 2024, he became the founding Director of the Wits Machine Intelligence and Neural Discovery Institute, an interdisciplinary institute focused on the fundamental

science of intelligence in machines, humans, and animals. Prof Rosman is also a founder of Lelapa AI, an organisation committed to building artificial intelligence for Africans, by Africans. In 2025, he was named a Fellow of the Canadian Institute for Advanced Research in the Learning in Machines and Brains programme. He was also recognised in the *TIME* 100 Most Influential People in AI list in 2025, reflecting his contribution to artificial intelligence research and the growth of Africa's AI ecosystem. He received his PhD in Informatics from the University of Edinburgh in 2014, where he also completed an MSc in Artificial Intelligence. He holds a BSc Honours in Computer Science and a BSc Honours in Applied Mathematics, both from the University of the Witwatersrand. His research focuses primarily on reinforcement learning and decision-making in autonomous systems, with particular interest in how learning can be accelerated by abstracting and generalising knowledge gained from solving related problems. His work contributes to fundamental questions in machine intelligence while also supporting practical advances in robotics, autonomous systems, and adaptive decision-making. Prof Rosman is a founder of the Deep Learning Indaba, a major African machine learning initiative focused on strengthening African participation, leadership, and capacity in artificial intelligence. The Indaba has grown into a continental ecosystem, with satellite events in 47 African countries. He was named a National Geographic Explorer in 2024, a CIFAR Azrieli Global Scholar by the Canadian Institute for Advanced Research in 2022, a recipient of a Google Faculty Research Award in machine learning in 2017, and a recipient of a Google Africa Research Award in 2021. In 2020, he was made a Senior Member of the IEEE. As an ADSC 2026 keynote speaker, Prof Rosman brings a leading perspective on artificial intelligence, reinforcement learning, autonomous systems, African AI capacity-building, and the development of research ecosystems that connect scientific excellence with social and technological impact.



Prof Inger Fabris-Rotelli

ADSC 2026 Keynote Speaker

University of Pretoria

Prof Inger Fabris-Rotelli is a full professor in the Department of Statistics, University of Pretoria. She has been at the Department of Statistics since 2004, achieving her PhD Mathematical Sciences in 2013. She has supervised 85 honours, 32 Masters and 8 PhD students to completion, and is currently supervising 10 honours, 6 Masters and 7 doctoral students, and has a particular passion for postgraduate supervision. She has published 50 peer-reviewed journal articles, 33 peer-reviewed conference proceedings papers and 1 book chapter. She was on the executive of the South African Statistical Association (SASA) from 2012 – 2018, 2023-current, and from 2019-2024 sat as a director on the ICCSSA (Institute of Certificated and Chartered Statisticians in South Africa) board. She was the immediate past-president of SASA and CEO of ICCSSA in 2025. She is a SACNASP council member elected 2021 – 2029 as well as a SACNASP registered scientist. Her research interests are in spatial statistics and GIS, as well as remote sensing and general image processing, including spatial epidemiology and criminology. She has a number of countrywide research collaboration group, namely SEPIMOD (Spatial Epidemiological Modelling) and StatSNetSA (a capacity development research group for building doctoral supervision skills in academic Statistics in South Africa and further in general supporting the young academics in Statistics in South Africa). Both these groups have resulted in a number of publications, postgraduate student growth and young academic development. She has a National Research Foundation Y2 rating in recognition of her research. Prof Fabris-Rotelli is an Abe Bailey Fellow (2007 tour award), is a 2018 fellow of the TUKS Young Researcher Leadership Program (TYRLP), and was selected as a BRICS Young Scientist 2020 in Artificial Intelligence. She received the University of Pretoria Exceptional Young Researcher award in 2023. As Scientific Committee Chair, Prof Fabris-Rotelli has played a central role in safeguarding the academic integrity, peer-review process, scholarly direction, and scientific quality of ADSC 2026. Her leadership helps ensure that the conference programme reflects methodological rigour, disciplinary breadth, African relevance, and

international scholarly standards. As an ADSC 2026 keynote speaker, Prof Fabris-Rotelli brings a strong statistical and spatial data science perspective to the conference theme, **African Data Science, for Africa**. Her contribution highlights the importance of robust statistical thinking, spatial reasoning, interdisciplinary collaboration, and evidence-based analytics in addressing complex African challenges across health, environment, urban systems, public safety, and sustainable development.



Prof Vukosi Marivate

ADSC 2026 Keynote Speaker

University of Pretoria

Prof Vukosi Marivate is a leading voice in artificial intelligence, machine learning, and data science in Africa. He is Professor of Computer Science at the University of Pretoria, holder of the ABSA-UP Chair of Data Science, and Founding Director of the African Institute for Data Science and Artificial Intelligence. As Director of AfriDSAI, he helps advance the institute's mission of using data science and artificial intelligence to shape a better future for the African continent. His work sits at the intersection of cutting-edge artificial intelligence and real-world societal impact, with a particular focus on natural language processing for African and low-resource languages. Through this work, Prof Marivate has become a major advocate for ensuring that African languages, datasets, and contexts are not merely represented in AI systems, but actively shape the design, evaluation, and governance of those systems. Prof Marivate leads the Data Science for Social Impact research group, where his work applies machine learning and data science to areas such as public safety, energy, governance, science, utilities, and social development. His research reflects a strong commitment to building AI systems that are technically rigorous, socially relevant, and responsive to African realities. He is also a co-founder of several transformative African AI initiatives, including the Deep Learning Indaba, the Masakhane Research Foundation, and Lelapa AI. These initiatives have played an important role in strengthening African AI capacity, supporting collaborative research communities, advancing African language technologies, and promoting locally relevant innovation. In 2026, Prof Marivate was appointed to the United Nations Independent International Scientific Panel on Artificial Intelligence, further recognising his global influence in the field. His presence at ADSC 2026 reflects the conference's commitment to advancing **African Data Science, for Africa**, grounded in excellence, inclusion, relevance, and impact.



Prof Karin-Therese Howell

ADSC 2026 Keynote Speaker

AIMS South Africa and Stellenbosch University

Prof Karin-Therese Howell is the Executive Director of AIMS South Africa and holds the academic rank of Associate Professor in Mathematics at Stellenbosch University. She holds a PhD in Mathematics from the University of the Free State and has published in international peer-reviewed journals. Her research is rooted in abstract algebra, with particular emphasis on near-vector spaces, and extends into algebraic biology, where biological problems are studied through algebraic structures, modelling approaches, and mathematical methods. Her work reflects the power of mathematics as both a theoretical discipline and a practical language for understanding complex systems. Prof Howell is also deeply committed to mathematics education and academic development. She has received multiple Vice-Rector's Awards for Excellence in First-Year Teaching at Stellenbosch University, reflecting her sustained contribution to student learning, curriculum development, and the strengthening of mathematical foundations among emerging scholars. In her leadership role at AIMS South Africa, Prof Howell contributes to one of

the continent's most important capacity-building platforms in the mathematical sciences. Her work supports the development of young African scientists, strengthens postgraduate training, and promotes the role of mathematics, statistics, computation, and data science in addressing scientific and societal challenges. Her broader academic leadership includes advancing mathematics in Africa, supporting women in mathematics, promoting inclusive excellence in the mathematical sciences, and helping to build research communities that connect rigorous theory with real-world relevance. As an ADSC 2026 keynote speaker, Prof Howell brings a powerful perspective on the importance of mathematical sciences for data science, artificial intelligence, modelling, interdisciplinary research, and African scientific capacity-building. Her contribution speaks directly to the conference theme, **African Data Science, for Africa**, by highlighting the foundational role of mathematics in building a strong, inclusive, and future-ready data science ecosystem on the continent.

23. GALA DINNER SPECIAL SPEAKER BIOS

African Data Science Conference 2026

Gala Dinner | Thursday, 25 June 2026 | 18:00–21:00

The ADSC 2026 Gala Dinner brings together delegates, keynote speakers, sponsors, partners, industry leaders, researchers, postgraduate students, policymakers, and invited guests for an evening of networking, celebration, and reflection. The programme features special contributions from distinguished leaders whose work connects science, innovation, technology, industry, and African development.



Professor Thokozani Majozi

President and Chairperson, Academy of Science of South Africa; Deputy Vice-Chancellor: Research and Internationalisation

University of Cape Town

Prof Thokozani Majozi is Deputy Vice-Chancellor: Research and Internationalisation at the University of Cape Town. He is a leading scholar and seasoned academic administrator. He joined UCT from the University of the Witwatersrand, where he served as Executive Dean of the Faculty of Engineering and the Built Environment. He also held a full professorship in the School of Chemical and Metallurgical Engineering, where he was the holder of the prestigious National Research Foundation–Department of Science and Technology Chair in Sustainable Process Engineering. His research contributions are extensive and widely recognised. Among his most significant achievements are the development of a continuous-time framework for the synthesis of batch plants, a novel technique for near zero-effluent batch chemical facilities, and a process integration technique for integrated water and membrane network systems. He has also advanced predictive models for reverse osmosis and electrodialysis membranes. These innovations are not only of academic importance but have also been adopted by industry, bridging the gap between research and practical application. Prof Majozi completed a BSc in Chemical Engineering and an MScEng in Chemical Engineering at the University of Natal, now the University of KwaZulu-Natal. He was awarded a Commonwealth Scholarship to pursue doctoral studies in the United Kingdom, where he completed his PhD in process integration at the University of Manchester Institute of Science and Technology. His academic career has included appointments at the University of Pretoria and the University of Pannonia in Hungary. He has published more than 300 scientific works, including influential books on batch chemical process integration, process synthesis, resource optimisation, and water management. He is a B1 NRF-rated scientist and has held major national and international leadership roles, including Chairperson of the Council for Scientific and Industrial Research, Vice-President of the Engineering Council of South Africa, Deputy Chairperson of the Council for the Built Environment, and President and Chairperson of the Academy of Science of South Africa. Prof Majozi is a Fellow of the Water Institute of Southern Africa, the Institution of Chemical Engineers in the United Kingdom, the African Academy of Sciences, and the South African Academy of Engineers. He is also a registered professional engineer with the Engineering Council of South Africa and a Chartered Engineer with the UK Engineering Council. His numerous awards include multiple National Science and Technology Forum Awards, National Research Foundation President's Awards, the South African Institute of Chemical Engineers Bill Neal-May Gold Medal, the AU-TWAS Award in Basic Sciences, Technology and Innovation, and the National Order of Mapungubwe in Bronze. His

advisory role brings deep scientific leadership, engineering excellence, and institutional experience to ADSC 2026.
At ADSC 2026, Professor Majozi's contribution to the Gala Dinner speaks to the importance of scientific excellence, responsible innovation, interdisciplinary collaboration, and the role of African knowledge institutions in shaping the future of data science, artificial intelligence, sustainability, and development.



Mr Ziaad Suleman

Chief Executive Officer, Cassava Technologies South Africa and Botswana
Cassava Technologies

Ziaad Suleman is the Chief Executive Officer of Cassava Technologies operations for South Africa and Botswana. He is an accomplished C – Suite business and technology leader, with his experience spanning over 25 years in the technology industry. He is responsible for the country's leadership, strategy, and operations across the Cassava portfolio of companies including Liquid Intelligent Technologies, Africa Data Centres, Sasai Fintech, Liquid Cloud and Security, and CassavaAI. Ziaad has a proven track record of driving business success through the enablement of technology solutions. He is a solution driven leader with a keen interest in digital transformation and has recently been named as the 2026 Digital Transformation Leader of the Year by the Future of Leadership Institute. Before joining Liquid, Ziaad was the Group Chief Commercial Officer (CCO) and an exco member at iOCO Technologies, formerly the EOH Company, for 3 ½ years from July 2021. Before that, he was a Director and the Head General Counsel for IBM Africa for 6 years before being promoted to Chief Operating Officer (COO) for IBM Southern Africa, a business he served and grew throughout his 13-year stay. Over and above iOCO, Ziaad represents South Africa as the SA Chair of 4IR and the Digital Economy on BRICS+. He is also a non – executive Director of : CollectiveX (the national initiative to solve the digital skills deficit), Southern Africa Philanthropy Foundation and Geeks 4 Learning. Ziaad completed his schooling at St. Johns College, Johannesburg, earning his undergraduate and postgraduate honours degree in Law (distinction) from the University of Natal. He also has an MDP Business Management degree (distinction) from GIBS Business School. In his spare time, Ziaad enjoys sport (golf, squash, padel tennis) and collects sports memorabilia and vintage toys.

24. SPECIAL ADSC 2026 AI & TECH PARTNERS

African Data Science Conference 2026

Applied AI, mathematical modelling, digital transformation, strategy execution, technology demonstration, and industry-facing innovation

ADSC 2026 recognises that African data science must be connected not only to research and teaching, but also to the organisations building real AI systems, solving complex business problems, supporting strategic execution, and creating opportunities for African technical talent. The Special ADSC 2026 Tech Engagement Partners represent this applied dimension of the conference. This section highlights two special technology engagement partners: **Isazi.ai** and **BI Technologies Africa**. Together, they strengthen the practical interface between data science research, artificial intelligence, optimisation, analytics, strategy, entrepreneurship, digital transformation, and measurable organisational impact. Their participation helps position ADSC 2026 as a space where delegates can engage with both the scientific frontiers of data science and the realities of implementation in African and global organisational contexts.

Special Tech Engagement at a Glance

2

Special Tech Partners

Isazi.ai and BI Technologies Africa contribute to ADSC 2026 through applied AI, analytics, digital transformation, strategy execution, innovation, and industry engagement

110+

Isazi.ai Team Members

a Johannesburg-founded AI and data science company with deep expertise across mathematics, physics, statistics, engineering, and computer science

100+

BI Technologies Projects

technology and advisory projects implemented across public- and private-sector contexts

175+

Projects Delivered by Isazi.ai

Isazi.ai has delivered projects across more than 10 industries and multiple international markets

2

BI Technologies SaaS Platforms

Electronic Strategy Office and Automated Tender Office support measurable strategy execution and tender management

R500,000

Strategy Workshop

a BI Technologies Africa-sponsored Strategy Development and Execution Workshop linked to the AI, Data & Strategy Innovation Lounge

Level 2
B-BBEE Contributor
BI Technologies Africa brings local enterprise capability, transformation commitment, and South African market relevance

3
Global Technology Partners
BI Technologies Africa is aligned with AWS, Microsoft, and IBM certified business partner ecosystems

1
Shared Purpose
to connect African data science talent, technology capability, applied innovation, digital transformation, and real-world organisational impact

The contribution of these partners is intentionally complementary. **Isazi.ai** brings the perspective of a specialist AI and data science company built around mathematical modelling, optimisation, machine learning, and frontier AI systems. **BI Technologies Africa** brings a digital transformation, advisory, platform development, strategy execution, and business enablement perspective, helping delegates connect AI, data, analytics, performance management, KPIs, operational delivery, and measurable organisational value. Together, they help ADSC 2026 move beyond discussion of data science as a purely technical discipline. Their involvement foregrounds the full journey from *problem formulation* to *model development*, from *insight* to *implementation*, from *technology* to *adoption*, and from *innovation* to *measurable impact*.

SPECIAL TECH ENGAGEMENT PARTNER 1

Isazi.ai

Isazi.ai: Applied AI, Mathematical Modelling and Frontier Problem-Solving

Partner role	Special ADSC 2026 Tech Engagement Partner contributing through applied artificial intelligence, data science consulting, mathematical modelling, optimisation, machine learning, technology demonstration, and industry engagement.
Meaning of the name	*Isazi* is the isiZulu word for scientist and bearer of knowledge. The name reflects the company's scientific identity and its commitment to using deep technical expertise to solve complex problems.
Origins	Isazi.ai was founded in Johannesburg in 2012 by three Wits graduates who believed that mathematics could solve some of Africa's hardest business and societal problems. The company has grown from this founding vision into a specialist AI, optimisation, and data science organisation with African roots and international reach.
Core disciplines	The Isazi.ai team spans five core technical disciplines: pure and applied mathematics, physics, statistics, electrical engineering, and computer science. This multidisciplinary foundation gives the company strong capability in mathematical reasoning, algorithmic design, systems modelling, optimisation, machine learning, and production-grade AI.

Team strength	Isazi.ai has grown into a team of more than 110 people, collectively holding more than 126 STEM degrees. Approximately 80% of the team is under the age of 35, reflecting the company's strong emphasis on developing young African technical talent.
Track record	The company has delivered more than 175 projects across more than 10 industries, including banking, healthcare, agriculture, insurance, manufacturing, media, and related sectors. Its work spans South Africa, the United Arab Emirates, the United Kingdom, and the United States.
Scientific method	Isazi.ai approaches every problem as a model: define the variables, set the constraints, formalise the system, and solve it algorithmically. This scientific approach is grounded in the belief that when conventional approaches stall, mathematical and computational reasoning can remove guesswork and reveal better solutions.
Flagship product: Sophia	**Sophia** is Isazi.ai's document intelligence and handwriting transcription platform. It has been deployed across 56 jurisdictions and is used in production environments where high accuracy, reliability, and operational trust are essential.
Flagship product: Hudson	**Hudson** is a supply-chain decision and digital-twin system developed from Isazi.ai's consulting work. It supports complex operational decision-making in environments where accuracy, optimisation, and system-level reasoning are critical.
Research and development	**Isazi Labs** is the company's research and development arm. It focuses on building AI systems that do not yet exist, including systems for calibrated inference, algorithm discovery, recursive agentic workflows, and specialised AI capability in high-value domains.
Current AI initiatives	Current Isazi Labs initiatives include **AccurateAI**, which supports calibrated and trustworthy inference for high-stakes domains; **XEvolve**, which uses LLM-guided evolutionary synthesis to discover algorithms that can surpass human-designed approaches; and an **AI Consultant** system that combines deep research with recursive agentic workflows.
Strategic vision	Isazi.ai's long-term research direction is guided by the idea of **Specialized Superintelligence**: systems designed to exceed human capability in narrow, high-value domains. This vision connects directly with ADSC 2026 themes around frontier AI, trustworthy inference, optimisation, applied intelligence, and responsible deployment.
Culture and diversity	Isazi.ai represents more than 30 cultures and 20 languages. The company views diversity of thought as essential to solving complex problems, and not merely as a symbolic value. In a company built to solve difficult problems, different ways of thinking are treated as a source of better answers.
Values	The company's values are **Empathy**, **Mastery**, **Productivity**, **Creativity**, and **Trust**. These values shape how Isazi.ai develops talent, works with clients, builds teams, and approaches technically demanding AI and data science challenges.

Conference contribution	Isazi.ai contributes to ADSC 2026 through the industry-facing programme, technology engagement, applied AI conversations, and frontier data science discussions. Its involvement strengthens the conference's focus on optimisation, mathematical problem-solving, AI consulting, company culture, production implementation, and the translation of advanced analytics into real-world value.
Programme representation	Isazi.ai is represented through contributors including **Dario Fanucchi**, **Faeeza Lok**, and **Obakeng Moepya**. Their participation brings insight into AI consulting practice, mathematical modelling, organisational culture, frontier AI development, optimisation, and applied data science in production environments.
Delegate relevance	For students, researchers, and early-career data scientists, Isazi.ai provides a powerful example of how deep mathematical, statistical, engineering, and computational training can be translated into high-impact careers. Its story reinforces one of the central messages of ADSC 2026: African talent is already here, and the right organisational cultures can help it thrive.

Why Isazi.ai matters for ADSC 2026

Isazi.ai represents a distinctly African example of technical excellence translated into real-world AI and data science capability. Its participation speaks directly to the conference theme, *African Data Science, for Africa*, by showing how local mathematical and scientific talent can build systems, products, and solutions with relevance far beyond the continent. The company's story also highlights the importance of culture in AI organisations. High-performing data science is not only about algorithms, models, or infrastructure. It also depends on teams, values, diversity of thought, talent development, and the ability to connect scientific depth with practical problem-solving.

SPECIAL TECH ENGAGEMENT PARTNER 2

BI Technologies Africa

BI Technologies Africa: Digital Transformation, Strategy Execution and Data-Driven Operations

Partner role	Special ADSC 2026 Tech Engagement Partner powering the **AI, Data & Strategy Innovation Lounge** and contributing to the conference's applied innovation, digital transformation, technology demonstration, strategy execution, and business enablement agenda.
About BI Technologies Africa	BI Technologies Africa is a professional technology and business consulting firm that helps organisations become foresight thinkers. Founded in 2016, the company serves clients across public- and private-sector industries by using technology to improve performance, competitiveness, organisational resilience, and the ability to navigate change.

Positioning	The company positions itself around the idea of *unlocking value by transforming businesses digitally*. Its work combines technology advisory, business consulting, engineering implementation, platform development, data analytics, change enablement, and delivery oversight.
What sets them apart	BI Technologies Africa brings a rare combination of technology and business consulting skills under one roof. The firm pairs seasoned advisory capability with hands-on engineering to design, build, and embed digital solutions that are intended to last beyond the initial implementation phase.
Transformation and partner ecosystem	BI Technologies Africa is a **Level 2 B-BBEE contributor** and operates within a trusted technology partner ecosystem that includes AWS, Microsoft, and IBM certified business partnerships. This combination supports local relevance, enterprise-grade delivery, and access to global technology capabilities.
Experience and track record	The company brings more than **30 years of combined consulting experience** and has implemented more than **100 technology and advisory projects**. Its track record spans advisory, digital transformation, analytics, platform implementation, programme delivery, and organisational enablement.
Vision	BI Technologies Africa's vision is to evolve into a preeminent business advisory and transformation enterprise, with strategic emphasis on digitisation, leadership, operational excellence, and scalable African technology capability.
Mission	The company's mission includes dominating the digital transformation space across Africa, building world-class in-house capability in process optimisation, developing leading operations and leadership advisory products, becoming a leading digital platform development firm in Africa, and creating innovative, agile leaders while empowering more women in technology.
Digital enablement capabilities	BI Technologies Africa provides end-to-end digital enablement capabilities spanning infrastructure and hardware, cloud and enterprise software, business intelligence and analytics, change and capability building, and programme and delivery management. These capabilities are designed to power data-driven operations and support practical transformation.
Infrastructure and cloud	The company's technology capabilities include infrastructure and hardware such as servers, networking, IoT devices, and connectivity, as well as cloud platforms, enterprise applications, and security. This gives the firm a practical foundation for supporting organisations that require scalable and secure digital platforms.
BI and analytics	BI Technologies Africa's analytics capability includes data integration, data modelling, dashboards, predictive analytics, operational reporting, and executive analytics. This directly supports data-driven decision-making, operational visibility, performance monitoring, and evidence-based leadership.

Change and capability	The company recognises that digital transformation requires more than technology deployment. Its change and capability services include stakeholder engagement, communication planning, training, user enablement, adoption monitoring, and capability development to support successful and sustained adoption of digital solutions.
Programme and delivery	BI Technologies Africa supports complex programme and project delivery through project planning, governance, risk management, stakeholder coordination, delivery oversight, monitoring, and implementation discipline. This capability is central to converting digital strategy into measurable execution.
Advisory services	The firm's advisory and consulting services include strategy enablement, digital transformation, AI, business intelligence and analytics, change management and capability building, and programme and project delivery. These services connect leadership priorities with technology implementation and measurable outcomes.
Strategy enablement	BI Technologies Africa supports strategy development, facilitated strategy sessions, strategy implementation, monitoring, data and digital strategy development, and leadership development. The intended outcome is a reliable, scalable, and implementable strategy that can be tracked and executed.
Digital transformation	Its digital transformation services include digital and AI maturity assessments, operations optimisation, agility implementation, and digital skills capability assessments. These services are intended to support secure, scalable digital platforms and future-ready organisational capability.
AI, business intelligence and analytics	The firm's AI, business intelligence and analytics services support data integration and modelling, predictive analytics, dashboards, operational reporting, and executive analytics. This aligns strongly with ADSC 2026 themes around applied analytics, responsible AI adoption, digital decision systems, and data-driven organisational transformation.
Platform development	BI Technologies Africa does not only advise; it also builds. Its proprietary SaaS platforms turn strategy and tender management into measurable, repeatable execution, demonstrating the company's commitment to product development and practical digital infrastructure.
Electronic Strategy Office	**Electronic Strategy Office** (**e-SO**) is a cloud-based strategy execution and benefits realisation management platform. It helps leaders see, track, and achieve strategic goals by consolidating objectives, indicators, initiatives, owners, risks, RAG status, evidence, and executive dashboards in one place.
e-SO value	The e-SO platform is designed for leadership teams that need to move from reporting activity to realising benefits. It supports a single source of truth, execution discipline through monthly and quarterly check-ins, accountable ownership, automated status visibility, and benefits-focused tracking.

Automated Tender Office	**Automated Tender Office** (**ATO**) is an AI-assisted tender management platform built for South African businesses. It supports opportunity capture, compliance document management, readiness tracking, and AI-assisted insights for RFQ and RFP submissions.
ATO value	The ATO platform helps organisations manage tenders, compliance, and submissions in one place. It supports B-BBEE, CSD, tax and mandatory document tracking, live readiness scoring against tender requirements, win-probability insight, and guidance before submission.
Innovation Lounge	The **AI, Data & Strategy Innovation Lounge**, powered by BI Technologies Africa, provides an interactive platform for advisory conversations, demonstrations, networking, practical engagement, and business transformation dialogue. It is designed to help delegates think about how AI and data initiatives move from ideas and pilots into implementation, measurement, and organisational value.
Strategic focus	The Lounge foregrounds the connection between data science and strategy execution. It focuses not only on what AI and analytics can do technically, but also on how organisations can define priorities, align stakeholders, design KPIs, track benefits, manage performance, and turn digital ambition into operational results.
Strategy workshop	BI Technologies Africa is sponsoring a **Strategy Development and Execution Workshop** valued at **R500,000**. This is not a cash prize. It is a facilitated strategy engagement intended to support a selected organisation in clarifying strategic priorities, defining measurable outcomes, developing KPIs, and building a practical execution roadmap.
Execution discipline	The BI Technologies Africa contribution highlights that successful AI and data initiatives require more than technical capability. They also require strategic alignment, governance, stakeholder buy-in, benefits tracking, performance measurement, change management, adoption monitoring, and disciplined implementation.
Value for organisations	For organisations, the BI Technologies Africa engagement creates an opportunity to reflect on AI readiness, data maturity, strategic priorities, measurement gaps, execution challenges, tender readiness, digital capability, and the practical steps required to convert analytics capability into value.
Value for students	For students and early-career data scientists, the Lounge provides exposure to the organisational side of data science. It shows that successful analysts and AI practitioners must understand business priorities, performance indicators, decision processes, tender and compliance environments, implementation constraints, and the language of organisational value.
Value for researchers	For researchers, the BI Technologies Africa engagement offers a reminder that methodological innovation must eventually meet implementation realities. Data science research becomes more powerful when it can inform decision-making, support strategy, strengthen digital operations, and create measurable impact in organisations and public institutions.

Delegate relevance	The BI Technologies Africa partnership gives ADSC 2026 delegates a practical space to explore how AI, data science, business intelligence, digital platforms, cloud, enterprise software, change management, and strategy execution can work together. It helps bridge the gap between technical innovation and the systems, processes, people, and metrics required to make innovation sustainable.

Why BI Technologies Africa matters for ADSC 2026

BI Technologies Africa strengthens the conference's applied digital transformation and business execution agenda. Its contribution reminds delegates that AI and data science do not create value automatically. Value is created when organisations can connect analytical capability to strategy, execution, technology infrastructure, cloud platforms, business intelligence, performance measurement, governance, change management, and decision-making. Through the AI, Data & Strategy Innovation Lounge, its digital enablement capabilities, and the R500,000 Strategy Development and Execution Workshop, BI Technologies Africa helps ADSC 2026 foreground a critical implementation question: how do African organisations move from digital ambition to measurable impact?

SHARED CONTRIBUTION

From African Talent to Applied Impact

How the Special Tech Engagement Partners Strengthen ADSC 2026

Applied AI	Isazi.ai contributes expertise in frontier AI, mathematical modelling, optimisation, trustworthy inference, agentic workflows, and specialised AI systems. BI Technologies Africa contributes the digital transformation, business intelligence, platform development, strategy execution, and implementation lens needed to turn AI into organisational value.
Talent development	Both partners demonstrate the importance of developing African technical and strategic talent. Isazi.ai highlights deep STEM capability and young technical leadership, while BI Technologies Africa foregrounds the skills needed to connect analytics with strategy, performance, change, adoption, execution, and transformation.
Research-to-practice	The section reinforces ADSC 2026 as a space where academic research, applied technology, consulting, entrepreneurship, digital platforms, business intelligence, advisory practice, and organisational implementation can interact productively.
Business transformation	The partners collectively show that data science impact requires both excellent technical systems and strong implementation environments. Mathematical modelling, AI, data platforms, cloud infrastructure, dashboards, KPIs, governance, change management, benefits realisation, and execution discipline must work together.

African innovation	Their participation supports the broader ADSC 2026 commitment to African-centred innovation: building systems, companies, capabilities, platforms, and partnerships that respond to African realities while meeting global standards.
Delegate experience	Delegates will be able to engage with these partners through programme sessions, technology engagement, applied discussions, exhibition-related activity, the AI, Data & Strategy Innovation Lounge, and networking opportunities that connect scientific content with real-world implementation.

Closing note

The Special ADSC 2026 Tech Engagement Partners help give practical meaning to the conference theme, *African Data Science, for Africa*. Isazi.ai demonstrates how African mathematical and scientific talent can build frontier AI systems and solve complex real-world problems. BI Technologies Africa demonstrates how data, AI, business intelligence, digital platforms, strategy, KPIs, change management, and execution discipline can help organisations convert technology into measurable value. Together, these partners strengthen ADSC 2026 as a conference that does more than present research. It convenes the people, organisations, tools, platforms, ideas, and implementation pathways needed to build a stronger African data science and AI ecosystem.



Dario Fanucchi

Co-founder & CTO

Isazi Consulting

Industry Engagement Partner

Dario holds dual Honours degrees in Pure Mathematics and Computational & Applied Mathematics from Wits, where he also lectured Computer Science. A William Cullen Medal recipient and South African representative at the International Mathematics Olympiad, he leads Isazi's machine learning and optimisation work across finance, infrastructure, and supply chain.



Faeeza Lok

Marketing and Brand Specialist

Isazi Consulting

Industry Engagement Partner

Faeeza Lok is the Marketing and Brand Specialist at Isazi Consulting, where she drives brand strategy, talent acquisition campaigns, and external partnerships. A scientist by training, she brings analytical rigour to creative work, bridging the gap between Isazi's technical depth and how it shows up in the world. Passionate about culture, people, and the stories that organisations tell about themselves, Faeeza leads Isazi's presence at some of Africa's most important data science and AI platforms.



Dunn Mukosa

Managing Partner for Business Advisory

BI Technologies Africa

Industry Engagement Partner

Dunn Mukosa is the Managing Partner for Business Advisory at BI Technologies Africa. He is a seasoned business executive, electrical engineer, energy expert, strategy advisor, digital transformation leader, and executive coach with more than 23 years of experience across the African continent. His professional work spans utilities, energy, capital projects, operational improvement, procurement optimisation, strategy development, business transformation, digital transformation, executive advisory, and technology-enabled performance improvement. He brings extensive experience in helping organisations translate strategic intent into disciplined execution, measurable benefits, and sustainable business value. Dunn holds an MSc in Control Engineering, awarded Cum Laude by the University of KwaZulu-Natal, and a BSc in Electrical Engineering from the University of Natal. He has also completed Business Action Learning and a Digital Transformation Masterclass at GIBS. In addition, he has professional training in Prosci Change Management, Business Coaching, and Disciplined Agile Senior Scrum Master certification through the Project Management Institute. He is a member of the South African Institute of Electrical Engineers and is a Registered Professional Engineer with the Engineering Council of South Africa. Over the course of his career, Dunn has successfully led and supported more than 80 mission-critical projects across Africa, working closely with CEOs, CFOs, executive teams, utilities, public sector organisations, and large corporates. His career portfolio includes work on major transformation, turnaround, strategy execution, and operational excellence programmes, with involvement in projects valued at more than seven billion US dollars. He is recognised for his ability to help organisations convert complex strategies into practical execution plans, clear delivery structures, measurable performance improvements, and sustainable organisational value. At BI Technologies Africa, Dunn supports business advisory, digital transformation, energy advisory, change management, project management, operating model design, and technology-enabled transformation. His work has included utility turnaround initiatives, energy trading office development, enterprise project management office implementation, digital transformation programmes, and change management for large-scale Microsoft Fabric implementation. He also serves as Chief Product Owner for e-SO, a software-as-a-service platform focused on strategy planning, execution tracking, accountability, and benefit realisation. Dunn speaks with authority on how digital business and technology can improve business processes, strengthen decision-making, enhance accountability, and create measurable value. His perspective is especially relevant for organisations seeking to modernise operations, improve performance, implement digital transformation, and ensure that technology investments deliver real business benefits rather than becoming isolated projects. At ADSC 2026, Dunn brings expertise in strategy execution, benefit realisation, operational excellence, digital business, energy and utilities transformation, change management, executive leadership, and technology-enabled performance improvement.



Towela Mukosa

Founding Chief Executive Officer

BI Technologies Africa

Industry Engagement Partner

Towela Mukosa is the Founding Chief Executive Officer of BI Technologies Africa, a Johannesburg-based business advisory and technology consulting firm established in 2016. The firm specialises

in business intelligence, data analytics, digital transformation, automation, AI-enabled solutions, and strategy execution. Towela is an experienced business and technology leader whose work focuses on helping organisations use data, digital tools, analytics, automation, and artificial intelligence to convert strategy into measurable business value. Towela holds a Master of Business Administration from GIBS and a BCom in Economics and Management from the University of Natal. She is a certified PRINCE2 project management professional through APMG and holds Senior Scrum Master certification through the Scrum Alliance. With more than 17 years of experience in IT consulting, business intelligence, operations improvement, and digital transformation, she has worked across multiple industries and African markets, supporting organisations as they seek to improve performance, strengthen execution discipline, and realise the benefits of strategic initiatives. Towela brings a practical and business-focused perspective on how organisations can use digital technologies, data, analytics, automation, and artificial intelligence to transform business processes, improve service delivery, and support data-driven decision-making. Her work focuses on closing the gap between strategic intent and operational execution by aligning data, technology, AI, governance, accountability frameworks, and performance management systems. She is particularly attentive to the challenges faced by African organisations, including skills constraints, fragmented systems, weak IT infrastructure, manual processes, limited data maturity, and the need to ensure that digital transformation and AI adoption are closely connected to real business outcomes. A central theme in Towela's work is helping leaders understand where AI can create measurable value, how to prioritise implementation use cases, how to prepare organisations for adoption, and how to assess whether the intended benefits of AI and digital investments are being realised. She supports organisations in moving beyond technology adoption as an end in itself, towards a more disciplined approach in which digital tools, analytics, automation, and AI are linked to operational improvement, strategic accountability, and measurable value creation. Through BI Technologies Africa, Towela has also led the development of digital platforms such as the Electronic Strategy Office, known as e-SO. This platform supports benefit realisation and strategy execution by helping organisations track strategic initiatives, monitor accountability, measure performance, and assess whether planned benefits are being achieved. The platform reflects her broader belief that strategy, technology, AI, data, and execution discipline must work together to create sustainable organisational value. At ADSC 2026, Towela contributes expertise in strategy execution, benefit realisation, digital business, AI implementation, business intelligence, process automation, data-driven decision-making, and digital transformation in Africa.

25. Invited Papers Speakers Bios

African Data Science Conference 2026

Across science, technology, innovation, leadership, and African-centred data science

ADSC 2026 is pleased to present a dedicated section of plenary and invited papers, featuring contributions from leading researchers and practitioners whose work spans mathematics, artificial intelligence, data science, business leadership, statistical science, and mathematical capacity-building in Africa. Together, these papers embody the conference theme, African Data Science, for Africa, by bridging scholarly rigor, institutional insight, technological innovation, and real-world impact.



Prof. Glen Nwaila

ADSC 2026 Plenary Speaker

Director of the African Research Centre for Ore Systems Science and Deputy Head of School at the University of the Witwatersrand

Prof. Nwaila is Director of the African Research Centre for Ore Systems Science, Deputy Head of School in the School of Geosciences at Wits, Associate Professor of Geometallurgy and Machine Learning, former Director of the Wits Mining Institute, and author of over 100 peer-reviewed papers. His research profile reflects the growing importance of AI and data science in mining, geoscience, and critical minerals. His work has attracted over 2,000 citations, with an h-index of 24 and an i10-index of 48. Recent highly cited work includes studies on the green energy transition, deep underground mineral resources, cobalt supply sustainability, digital transformation in the minerals industry, and machine learning for spatial interpolation and block modelling. Prof Nwaila holds an MSc in Chemical Engineering from the University of Cape Town (South Africa) and a PhD in Geosciences from The Julius Maximilians University of Würzburg (Germany). His work integrates Geometallurgy, Geostatistics, Artificial Intelligence, and Remote Sensing to address challenges across the mineral value chain, from exploration and resource modelling to processing optimisation, environmental monitoring, and sustainability. He leads and collaborates on major national and international projects in critical minerals, AI applied to the mining industry, development of remote sensing solutions, mining technical skills development frameworks, and applied research services for industry and public institutions, with a strong emphasis on uncertainty management, responsible mineral development, and mineral beneficiation frameworks. At ADSC 2026, Prof. Nwaila will show how AI, particularly variational Gaussian processes, can help transform mineral resource models from static technical outputs into adaptive, uncertainty-aware decision systems. His invited paper speaks directly to smarter mining operations: better geological modelling, improved resource confidence, stronger uncertainty quantification, and more informed decisions across the mining value chain.



Prof. Temesgen Zewotir

ADSC 2026 Invited Speaker and Data Science Education Panelist

Full Professor and Pioneer Director of the Data Science Unit for Business and Industry at the University of KwaZulu-Natal

Prof. Temesgen Zewotir is a Full Professor and Pioneer Director of the Data Science Unit for Business and Industry at the University of KwaZulu-Natal (UKZN), South Africa. He serves as an International Advisory Board Member of the African Centre of Excellence in Data Science (ACE-DS) and holds Adjunct Professor appointments at Addis Ababa University, Bahir Dar University, Haramaya University, and the University of Rwanda. His research bridges theoretical statistical modelling and innovative machine learning, with a strong focus on developing data science solutions for complex African challenges in health, industry, and development. Prof. Zewotir has an extensive and influential publication record spanning applied statistics, biostatistics, spatial modelling, public health, data science, and machine learning. His Google Scholar profile lists 279 scholarly entries, with over 5,400 citations, an h-index of 36, and an i10-index of 108. Since 2021 alone, his work has attracted over 4,100 citations, with an h-index of 29 and an i10-index of 86. His highly cited publications include work on COVID-19 mortality risk factors, malaria prevalence and risk factors, maternal health care inequalities, child stunting, machine learning for under-five undernutrition, and diabetes risk factors in South Africa. He is an elected member of the International Statistical Institute (ISI) and has served as a member of the ISI Special Interest Group on Data Science Ad Hoc Committee. Prof. Zewotir holds a PhD in Mathematical Statistics from the University of the Witwatersrand, making his participation especially meaningful for ADSC 2026 hosted at Wits. We are honoured to welcome Prof. Zewotir to the African Data Science Conference 2026, where he will join the Data Science Education panel and deliver an invited paper on the future of data science curriculum design and education in Africa.



Dr Raeesa Ganey

ADSC 2026 Invited Paper Speaker

Lecturer in the School of Statistics and Actuarial Science at the University of the Witwatersrand

Dr Raeesa Ganey is a Lecturer in the School of Statistics and Actuarial Science at the University of the Witwatersrand, where she teaches Mathematical Statistics and Multivariate Data Analysis. She holds a BSc in Actuarial Science from North-West University, as well as a BCom Honours, MSc, and PhD in Statistics from the University of Cape Town. Her research focuses on multivariate data visualisation, with particular emphasis on biplots and their theoretical and practical extensions for high-dimensional, dynamic, and complex data structures. She contributes to the development of practical R-based tools that support richer visual exploration and interpretation of multivariate datasets. Dr Ganey is a member of the Centre for Multi-Dimensional Data Visualisation (MuViSU), the South African Statistical Association (SASA), and the SASA Multivariate Data Analysis Group (MDAG), and is an Associate of NITheCS. At ADSC 2026, Dr Ganey will present invited work on animated biplots of African climate patterns, highlighting the role of multivariate visualisation in understanding complex environmental and climate-related data. Her contribution speaks directly to the conference theme by showing how statistical innovation, visual analytics, and African-centred data science can support interpretation, communication, and decision-making in climate and development contexts.



Dr Michael Cameron Gramanie

ADSC 2026 Invited Paper Speaker

Medical Doctor, PhD Candidate at the University of the Witwatersrand, and Researcher at the Wits VIDA Research Unit

Dr Michael Cameron Gramanie is a South African medical doctor, holding an MBBCh from the University of the Witwatersrand, and is currently a PhD candidate at Wits. He conducts his doctoral research at the Wits VIDA Research Unit, where his work focuses on evaluating generative artificial intelligence diagnostic tools for safe, effective, and contextually appropriate use in South African public hospitals. His research sits at the intersection of clinical medicine, artificial intelligence, public health, and responsible innovation, with a particular focus on how emerging AI systems can support diagnosis and patient management in low- and middle-income settings. At ADSC 2026, Dr Gramanie will present on behalf of VALID, a large Gates Foundation-funded project that benchmarks AI models for diagnosis and patient management across low- and middle-income health-system contexts. His invited paper contributes to an urgent and highly relevant conversation on the responsible deployment of large language models and multimodal AI in healthcare, especially where diagnostic resources are constrained and where safety, equity, clinical validity, and local relevance are essential.

26. OPENING AND CLOSING SPEAKERS

African Data Science Conference 2026

Institutional leadership voices marking the beginning and conclusion of ADSC 2026.

OPENING AND CLOSING SPEAKERS

Institutional Leadership Voices



Prof Ian Jandrell

ADSC 2026 Opening Speaker

Deputy Vice-Chancellor: Systems and Operations, University of the Witwatersrand

Prof Ian Jandrell is Deputy Vice-Chancellor: Systems and Operations at the University of the Witwatersrand. His portfolio supports the effective management of the University's systems, operations, infrastructure, services, ICT, campus protection services, property portfolio, and online strategy, all of which are central to enabling Wits' academic and research mission. Prof Jandrell is a Personal Professor of Electrical and Information Engineering and has held executive management roles in South African higher education for more than two decades. He previously served as Dean of the Faculty of Engineering and the Built Environment and, before that, as Head of the School of Electrical and Information Engineering. A registered local and international Professional Engineer, he has more than 30 years of experience in engineering, with specialist expertise in lightning, high-voltage engineering, forensic engineering, and systems engineering. He has held several distinguished academic and research leadership positions, including the Transnet Professorship of Systems Engineering in the Wits Transnet Centre for Systems Engineering and the CBI-electric Chair of Lightning. He is an NRF-rated scientist, a widely published scientific author, and recipient of the NSTF-South32 Award for Engineering Research Capacity Development. His scientific work includes contributions to lightning injury, keraunopathology, lightning detection and location, and the risks associated with lightning. Prof Jandrell is a Senior Member of the IEEE, a Fellow of the South African Academy of Engineering, and a Fellow of the South African Institute of Electrical Engineers. He has served on scientific committees for major international conferences in lightning protection and high-voltage engineering and has contributed as a reviewer for leading international journals. His participation in ADSC 2026 reflects Wits University's commitment to strengthening the institutional systems that support African research, innovation, infrastructure, and data-driven collaboration.



Prof Lynn Morris

ADSC 2026 Closing Speaker

Deputy Vice-Chancellor: Research and Innovation, University of the Witwatersrand

Prof Lynn Morris is Deputy Vice-Chancellor: Research and Innovation at the University of the Witwatersrand. She is an A-rated, internationally recognised scientist with extensive experience

in research leadership, institutional strategy, scientific collaboration, postgraduate development, and innovation. Her leadership supports Wits University's research agenda, innovation ecosystem, and contribution to knowledge generation across disciplines. Prof Morris completed her undergraduate studies at Wits University and obtained a DPhil from the University of Oxford. She is internationally recognised for her work on the antibody response to HIV and has played a major role in conducting validated end-point assays for HIV vaccine clinical trials. She previously served as interim Executive Director of the National Institute for Communicable Diseases, where she helped lead the institution through major public health crises, including the 2017/18 listeria outbreak and the COVID-19 pandemic. Her academic and research career includes joint appointments as Research Professor in the School of Pathology in the Faculty of Health Sciences at Wits and Head of the HIV Virology Laboratory in the Centre for HIV and STIs at the National Health Laboratory Service. She is also an Honorary Senior Scientist at the Centre for the AIDS Programme of Research in South Africa. Prof Morris has supervised numerous postgraduate and postdoctoral researchers and has made substantial contributions to scientific capacity-building. She has published extensively, including hundreds of journal articles, book chapters, patents, and scientific opinions, and has consistently appeared on the Web of Science list of highly cited researchers for her work in HIV and AIDS. She is a member of the Academy of Science of South Africa and a Fellow of the African Academy of Sciences, the Royal Society of South Africa, and The World Academy of Sciences. Her awards include the Wits Vice-Chancellor's Research Award, the South African Medical Research Council Gold Medal, the Harry Oppenheimer Fellowship Award, and the World Academy of Sciences Prize in Medical Sciences. Her role in ADSC 2026 reflects the importance of research excellence, interdisciplinary collaboration, public-impact science, and African-centred innovation in shaping the future of data science and artificial intelligence.

27. CONFERENCE COMMITTEES

African Data Science Conference 2026

Scientific Committee, Advisors, and Local Organising Committee

ADSC 2026 is supported by a governance structure that brings together academic leadership, scientific oversight, strategic advisory input, and local organisational coordination. This structure is intended to safeguard the academic quality of the conference, strengthen peer-review processes, support interdisciplinary engagement, and ensure that the conference remains aligned with its theme: **African Data Science, for Africa**.

Scientific Committee

Chair: Prof Inger Fabris-Rotelli
University of Pretoria

The Scientific Committee safeguards the academic integrity, peer-review process, scholarly direction, and intellectual quality of ADSC 2026. The committee supports the review and curation of scientific contributions and helps ensure that the programme reflects the breadth, rigour, and relevance of African data science.

Committee Members

- **Dr Humphery Brydon**
  University of the Western Cape
- **Dr Ndivhuwo Makondo**
  IBM Research Africa
- **Prof Innocent Maposa**
  Stellenbosch University
- **Dr Nomalanga Mashinini**
  University of the Witwatersrand
- **Prof David Mhlanga**
  North-West University
- **Dr Farai Mlambo**
  University of the Witwatersrand
- **Dr Isaac Nyambiya**
  Great Zimbabwe University
- **Dr Sunday Oladejo**
  Stellenbosch University
- **Dr Peter Olukanmi**
  University of Johannesburg
- **Dr Moses Phiri**
  NIQ Company
- **Dr Taariq Surtee**
  University of the Witwatersrand
- **Dr Tsitsi Zengeya**
  University of KwaZulu-Natal

Local Organising Committee

The Local Organising Committee coordinates the operational, logistical, stakeholder-engagement, and implementation aspects of ADSC 2026. Its work includes programme coordination, venue planning, delegate communication, partnerships, sponsorship engagement, workshops, exhibitions, student support, registration liaison, and on-site conference delivery.

Committee Members

- **Dr Taariq Surtee**
  University of the Witwatersrand
- **Eleni Flack-Davison**
  University of the Witwatersrand
- **Lazarus Matizirofa**
  University of the Witwatersrand
- **Dr Farai Mlambo**
  University of the Witwatersrand
- **Kagiso Modise**
  University of the Witwatersrand
- **Prof Raeesa Moolla**
  University of the Witwatersrand



ADSC 2026 Conference Chair

Dr Farai Mlambo

University of the Witwatersrand

Dr Farai Fredric Mlambo is a Senior Lecturer in Digital Business at Wits Business School, University of the Witwatersrand, and Programme Director of the Master of Management in Digital Business. He is a data analytics scholar, artificial intelligence specialist, statistical machine learning researcher, and business school academic whose work sits at the intersection of digital transformation, data science, artificial intelligence, statistical modelling, and strategic decision-making. His academic profile combines advanced quantitative training with postgraduate teaching, curriculum leadership, research supervision, industry engagement, and a strong commitment to building Africa's data-driven future. Dr Mlambo is a Fellow of the Wits Machine Intelligence and Neural Discovery (MIND) Institute, an Associate of the National Institute for Theoretical and Computational Sciences (NITheCS), and Director of the Statistical Machine Learning (Stat–ML) Lab. Through these roles, he contributes to a growing ecosystem of artificial intelligence, machine learning, computational statistics, and data science research in South Africa and across the continent. He also serves as Chair of the African Data Science Conference, where he has played a leading role in convening academics, researchers, postgraduate students, industry partners, government stakeholders, professional bodies, and technology leaders around the future of data science, AI, employability, innovation, and digital transformation in Africa. He holds a PhD in Mathematical Statistics from Nelson Mandela University, where his doctoral research focused on wavelet theory for economic and financial cycles. This work developed a novel framework for smoothing and analysing cyclical structures in economic and financial time series and received international recognition through the Best Paper Award at the European Simulation and Modelling Conference in 2019. He also holds an MCom in Statistics, completed cum laude, with research on causality testing for non-stationary time series in regime-switching environments, as well as a BCom Honours in Mathematical Statistics and a BCom in Economics and Statistics, both completed cum laude. Dr Mlambo's research is situated within statistical machine learning, Bayesian statistics, uncertainty quantification, explainable artificial intelligence, business analytics, and digital transformation. His work has applications across healthcare, finance, sustainability, climate analytics, customer analytics, fraud detection, risk modelling, spatial machine learning, and uncertainty-aware decision systems. He has contributed to healthcare-focused machine learning research, including work on COVID-19 risk stratification, malaria diagnosis using clinical and demographic features, and broader applications of artificial intelligence and machine learning for improving health outcomes in Africa. His research emphasises models that are not only accurate, but also interpretable, calibrated, contextually relevant, and useful for decision-making in complex real-world settings. At Wits Business School, Dr Mlambo teaches and develops postgraduate content in applied big data and analytics, healthcare data analytics and artificial intelligence, digital business, research

methodology, applied data science, machine learning, and executive education. His teaching philosophy combines academic rigour, practical relevance, critical thinking, and the development of analytical capabilities required by contemporary managers, executives, policymakers, and business leaders. He is recognised for making quantitatively demanding material accessible to diverse student audiences while maintaining strong standards of conceptual depth, methodological clarity, and professional relevance. Dr Mlambo has built a substantial postgraduate supervision portfolio across honours, master's, and doctoral levels. His supervision spans Bayesian machine learning, probabilistic modelling, uncertainty quantification, explainable AI, healthcare analytics, financial analytics, fraud detection, recommender systems, customer churn modelling, geospatial analytics, cybersecurity, and responsible AI. He is committed to mentoring emerging scholars, strengthening postgraduate research capacity, and supporting students to produce rigorous, relevant, and publishable research that responds to contemporary business, technological, and societal challenges. Beyond his formal academic roles, Dr Mlambo is actively involved in postgraduate development, public scholarship, academic citizenship, consulting, and research capacity-building. He is the author of *A Survival Guide for Every Postgraduate Journey*, a postgraduate development book focused on mindset, resilience, research productivity, and the realities of master's and doctoral study. Across his teaching, research, supervision, leadership, and conference-building work, Dr Mlambo strives to bridge analytical rigour with human-centred academic practice, and to advance the role of data science and artificial intelligence in shaping inclusive, evidence-informed decision-making in Africa and beyond.



ADSC 2026 Organising Committee Chair

Dr Taariq Surtee

University of the Witwatersrand

Dr Taariq Surtee is Head of eResearch at the University of the Witwatersrand, where he plays a central role in providing research technology, research management solutions, equipment, and strategic advice to the academic and research community. He works closely with the Research Office, Wits Library, Wits ICT, academic departments, and external technology partners to support a collaborative environment for research and innovation. His portfolio spans research data management, research technology strategy, policy development, equipment management, research integrity, and cross-institutional research enablement. He is recognised by the International Professional Recognition Council as a Research Management Professional and actively supports the STARS research manager professionalism advocacy programme. He represents eResearch on several university committees, including Senate and Council structures, and contributes to national and international higher education initiatives involving organisations such as SARIMA, CARTA, HEITSA, CSIR, IBM, Microsoft, and Amazon. Dr Surtee is also active in publishing, teaching, supervision, and knowledge dissemination. His work includes supporting the adoption of next-generation research technologies, including quantum computing, and he describes his professional identity as that of a *pracademic*, bringing together practical research management expertise and academic engagement.

Operational and Administrative Support

The operational and administrative support structure for ADSC 2026 brings together the organising team, fundraising team, Wits Enterprise, student representatives, institutional partners, and conference volunteers. This structure supports the practical delivery of the conference, including registration, logistics, delegate communication, venue coordination, sponsorship engagement,

workshops, exhibitions, student support, and on-site implementation.

Wits Enterprise	Provides professional conference administration support, including registration processes, invoicing and payment liaison, delegate queries, sponsorship administration support, event coordination, and operational alignment with institutional systems.
ADSC 2026 Organising Committee	**Chair:** Dr Taariq Surtee **Members:** Prof Raeesa Moolla; Dr Isaac Nyambiya; Ms Eleni Flack-Davison; Mr Lazarus Matizirofa; Ms Kagiso Modise The Organising Committee supports the overall operational delivery of ADSC 2026. Its work includes programme coordination, venue planning, delegate communication, workshop and panel support, institutional liaison, registration coordination, logistics, student representative coordination, exhibition support, and the smooth running of conference activities before and during the event.
Student Representatives	ADSC 2026 Student Representatives support delegate experience and on-site delivery. Their responsibilities include registration assistance, venue guidance, timekeeping, session support, workshop support, speaker assistance, poster and exhibition support, help desk assistance, and general conference logistics. Their participation also reflects the conference's commitment to student development, leadership, and exposure to African data science networks.
Conference Volunteers	Conference volunteers assist with practical on-the-ground implementation, including delegate movement, room support, signage, communication, session transitions, and general problem-solving during the conference.
Institutional Partners	Institutional partners support the conference through academic collaboration, venue and infrastructure support, sponsorship, technical assistance, speaker engagement, workshop contributions, exhibitions, and broader stakeholder mobilisation.
On-site Delivery	During the conference, operational support will focus on registration, venue readiness, session transitions, technical support escalation, catering coordination, workshop logistics, poster and exhibition arrangements, delegate queries, speaker support, and real-time programme communication.

27. ADVISORS

African Data Science Conference 2026

Strategic, academic, institutional, and interdisciplinary guidance

ADSC 2026 Advisory Group and Advisors

The ADSC 2026 Advisory Group comprises distinguished academic, research, industry, and institutional leaders whose expertise spans data science, artificial intelligence, geospatial analytics, engineering, public policy, governance, sustainability, quantum computing, digital innovation, and interdisciplinary research. Through their collective experience and strategic insight, the Advisory Group helps strengthen the academic quality, institutional relevance, industry engagement, and broader societal orientation of the conference. The ADSC 2026 Advisory Group includes Prof Kanshukan Rajaratnam, Prof Paida Mhangara, Prof Thokozani Majozi, Prof Costa Hofisi, Prof Charis Harley, and Dr Sibusisiwe Khuluse Makhanya.



Professor Paida Mhangara

University of the Witwatersrand

ADSC 2026 Advisor

Professor Paidamwoyo Mhangara is the Head of School for the School of Geography, Archaeology, and Environment Studies at Wits University. He is a senior Earth Observation scientist, academic and executive with research interests in land atmospheric interactions, machine learning for land cover characterisation and advanced remote sensing modelling for land cover monitoring. He has extensive experience developing large-scale operational geospatial products and services to support spatial planning and decision-making. For over a decade, Mhangara has managed several earth observation international collaborative projects on crop monitoring, environmental monitoring, land use and land cover mapping, and water resources management. He is registered as a professional geospatial scientist with the South African Council for Natural and Scientific Professions. He co-authored a paper entitled "Validation of Sentinel-2 leaf area index (LAI) product derived from SNAP toolbox and its comparison with global LAI products in an African semi-arid agricultural landscape." in the Remote Sensing Letters journal that received the Remote Sensing Letters Award for the best paper published in Remote Sensing Letters in 2020 by Taylor & Francis and The Remote Sensing and Photogrammetry Society. His expertise strengthens the geospatial, environmental, and Earth Observation dimensions of ADSC 2026.



Professor Kanshukan Rajaratnam

Stellenbosch University

ADSC 2026 Advisor

Prof Kanshukan Rajaratnam is Director of the School for Data Science and Computational Thinking at Stellenbosch University. He joined Stellenbosch University as the inaugural director of the School in January 2020. Prior to this, he was an Associate Professor of Finance at the University of Cape Town, where he held multiple leadership roles, including Faculty Strategic Projects Manager, Deputy Dean, and Acting Dean of the Faculty of Commerce. His research focuses on the application of data science and operations research in finance and banking. He is rated by the National Research Foundation as an internationally acclaimed researcher. His professional experience also includes work in industry, including Accenture and Nedbank in South Africa, and Capital One in the United States. Prof Rajaratnam leads a School with a vision to be a world-class institution in data science and computational thinking in and for Africa. Since its launch in July 2019, the School has achieved global recognition and impact. His leadership continues to support greater collaboration between academia, industry, and society, and his advisory role contributes strongly to the capacity-building and strategic orientation of ADSC 2026.



Professor Thokozani Majozi

University of Cape Town

ADSC 2026 Advisor

Prof Thokozani Majozi is Deputy Vice-Chancellor: Research and Internationalisation at the University of Cape Town. He is a leading scholar and seasoned academic administrator. He joined UCT from the University of the Witwatersrand, where he served as Executive Dean of the Faculty of Engineering and the Built Environment. He also held a full professorship in the School of Chemical and Metallurgical Engineering, where he was the holder of the prestigious National Research Foundation–Department of Science and Technology Chair in Sustainable Process Engineering. His research contributions are extensive and widely recognised. Among his most significant achievements are the development of a continuous-time framework for the synthesis of batch plants, a novel technique for near zero-effluent batch chemical facilities, and a process integration technique for integrated water and membrane network systems. He has also advanced predictive models for reverse osmosis and electrodialysis membranes. These innovations are not only of academic importance but have also been adopted by industry, bridging the gap between research and practical application. Prof Majozi completed a BSc in Chemical Engineering and an MScEng in Chemical Engineering at the University of Natal, now the University of KwaZulu-Natal. He was awarded a Commonwealth Scholarship to pursue doctoral studies in the United Kingdom, where he completed his PhD in process integration at the University of Manchester Institute of Science and Technology. His academic career has included appointments at the University of Pretoria and the University of Pannonia in Hungary. He has published more than 300 scientific works, including influential books on batch chemical process integration, process synthesis, resource optimisation, and water management. He is a B1 NRF-rated scientist and has held major national and international leadership roles, including Chairperson of the Council for Scientific and Industrial Research, Vice-President of the Engineering Council of South Africa, Deputy Chairperson of the Council for the Built Environment, and President and Chairperson of the Academy of Science of South Africa. Prof Majozi is a Fellow of the Water Institute of Southern Africa, the Institution of Chemical Engineers in the United Kingdom, the African Academy of Sciences, and the South African Academy of Engineers. He is also a registered professional engineer with the Engineering Council of South Africa and a Chartered Engineer with the UK Engineering Council. His numerous awards include multiple National Science and Technology Forum Awards, National Research Foundation President's Awards, the South African Institute of Chemical Engineers Bill Neal-May Gold Medal, the AU-TWAS Award in Basic Sciences, Technology and Innovation, and the National Order of Mapungubwe in Bronze. His advisory role brings deep scientific leadership, engineering excellence, and institutional experience to ADSC 2026.



Dr Sibusisiwe Makhanya

IBM Research Africa

ADSC 2026 Advisor

Dr Sibusisiwe Makhanya is a Senior Research Manager and Leader of the IBM Research Lab in South Africa. She leads teams contributing to advances in fundamental and applied artificial intelligence and quantum computing. As a research scientist, her core competence and interests are in spatial statistics and data science, and she has contributed to research in climate, environment, and health. She holds a PhD in Spatial Statistics from the University of Twente, an MSc in Mathematical Statistics from the University of the Witwatersrand, and undergraduate science degrees from the University of KwaZulu-Natal. She serves on the advisory board for the National Graduate Academy for Mathematical and Statistical Sciences in South Africa. Her advisory role brings together expertise in AI, quantum computing, spatial statistics, applied statistical learning, sustainability, research leadership, and industry research translation. Her contribution strengthens the connection between ADSC 2026, advanced research, industry innovation, and African scientific capacity-building.



Professor Costa Hofisi

North-West University

ADSC 2026 Advisor

Professor Costa Hofisi is a NRF rated Researcher, Full Professor and founding Research Director of the Afrocentric Governance of Publis Affairs (AGoPA research entity) at North-West University. He is an expert in innovation and digital transformation in the public sector who is also a certified assessor and moderator. He has successfully supervised more than 20 Phd Student and at least 20 Masters and numerous Honours students. He has published more than 100 journal articles and book chapters in reputable outlets. Professor Hofisi was awarded the exceptional researcher award for his prowess in generating third stream income, the Rector's award for being one of the most productive researchers at North-West University. He has more than 20 years experience in teaching, research and postgraduate supervision. He has been contracted by several stakeholders such the Presidency to evaluate achievements by the Government of South Africa in the implementation of the State of the Nation addresses, train the Policy and Research Services staff to write policy briefs, conduct a comparative study of centres of Government in 10 countries to recommend a model for adoption in South Africa, the National School of Government to develop modules and facilitate the delivery of modules for various South African National and Provincial Government Departments, The South African Gauteng Provincial Department of Economic Planning and Policy to develop an innovation district framework in the Gauteng Province and to develop an innovation observatory project for the province. His advisory contribution supports the public policy, governance, institutional transformation, and societal impact dimensions of ADSC 2026.



Professor Charis Harley

University of Johannesburg

ADSC 2026 Advisor

Prof Charis Harley is Professor in the Faculty of Engineering and the Built Environment at the University of Johannesburg and Head of the Data Science Across Disciplines Research Group. She is a computational mathematician whose work spans numerical methods, data analysis, data science, machine learning, and interdisciplinary applications of computational modelling. She was a Y1-rated professor in the School of Computer Science and Applied Mathematics at the University of the Witwatersrand in 2017. She completed her Doctor of Philosophy in Computational and Applied Mathematics at the University of the Witwatersrand, along with a BSc Honours degree with distinction in both Mathematics and Computational and Applied Mathematics. Her research includes the numerical solution of problems in fluid flow and heat transfer. She won the DAAD In-Country Scholarship as a postgraduate student and has since been awarded the Carnegie Sandwich Research Grant and the Friedel Sellschop Award as a full-time academic. The Carnegie Sandwich Research Grant allowed her to visit the Oxford Centre for Collaborative Applied Mathematics and the Oxford Centre for Industrial and Applied Mathematics at the Mathematical Institute, University of Oxford. The Friedel Sellschop Award enabled her to conduct research with colleagues at Texas A&M University, where she subsequently completed a postdoctoral research visit through the support of a J. William Fulbright Foreign Visitor Research Scholarship. She also holds a Bachelor of Arts degree in History and Philosophy, with the hope of pursuing further studies in Philosophy in the future. Her advisory role supports the computational, mathematical, engineering, and industry-facing dimensions of ADSC 2026.

28. SCIENTIFIC SESSION CHAIRS

ADSC 2026 Session Chairs

African Data Science Conference 2026

The ADSC 2026 Scientific Session Chairs form a critical pillar of the conference's academic delivery. They are responsible for introducing speakers, managing Q&A segments, keeping sessions on schedule, facilitating technical transitions, coordinating with audiovisual support, and ensuring a smooth, engaging experience for both presenters and attendees. Their role upholds the scientific rigor and professional flow of the conference while demonstrating leadership, subject-matter competence, and collegiality. Serving as session chairs also reflects the conference's commitment to developing research stewardship, academic mentorship, and the strengthening of Africa's next generation of data science and artificial intelligence research leaders.



Session Chair: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics

Prof Kennedy Otwombe

University of the Witwatersrand

Kennedy S.N. Otwombe is an accomplished biostatistician and public health researcher with over 20 years of experience in clinical trials, epidemiological studies, and capacity building in HIV, TB, and infectious diseases. He holds the position of Associate Professor in the School of Public Health at the University of the Witwatersrand and serves as Lead Biostatistician at the Perinatal HIV Research Unit (PHRU), Chris Hani Baragwanath Academic Hospital, in Soweto, South Africa. Professor Otwombe has extensive expertise in designing clinical trials, statistical analysis and interpretation, presenting data safety and monitoring board reports and contributing to clinical study reports for regulatory agencies, and sponsors. He has played a pivotal role in major international trials and policy impacting research, with a scholarly output of over 170 peer-reviewed publications reflecting the breadth and depth of his contributions to global health research. He currently serves as trial statistician or DSMB member on several ongoing trials. He focuses on research that aims to improve health outcomes/well-being of children, adolescents, adults and key populations using conventional statistical methods and AI to improve clinical diagnosis of diseases through machine learning approaches. Professor Otwombe is deeply passionate about capacity building in higher education, believing that investing in the next generation of researchers and scientists is fundamental to achieving sustainable health impact across Africa. He has successfully supervised and mentored numerous PhD and Master's students, and remains committed to creating pathways for emerging scholars to develop the technical and leadership skills needed to lead world-class research on the continent. Professor Otwombe is actively involved in academic leadership as a council member of the AMREF International University (Nairobi, Kenya), chairing trial scientific advisory boards and as an academic editor for high-impact journals. He is also a grant reviewer for leading funders and an affiliate of the Data Science for Health Discovery and Innovation in Africa (DSI INFORM Africa network).

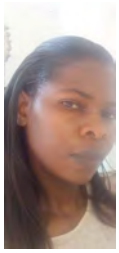


Session Chair: Statistical, Mathematical, and Computational Foundations of Data Science and AI

Dr Raeesa Ganey

University of the Witwatersrand

Dr Raeesa Ganey is a Lecturer in the School of Statistics and Actuarial Science at the University of the Witwatersrand, where she teaches Mathematical Statistics and Multivariate Data Analysis. She holds a BSc in Actuarial Science from North-West University and a BCom Honours, MSc, and PhD in Statistics from the University of Cape Town. Her research focuses on multivariate data visualisation, particularly biplots, where she builds theoretical extensions and practical R tools for high-dimensional and dynamic data. She is a member of the Centre for Multi-Dimensional Data Visualisation (MuViSU), the South African Statistical Association (SASA), and its Multivariate Data Analysis Group (MDAG), and an Associate of NITheCS.



Session Chair:African Language Technologies, NLP, Speech, and Multimodal AI

Dr Tsitsi Zengeya

University of Kwa-Zulu Natal

Dr Tsitsi Zengeya holds a PhD in Computer Science from the University of KwaZulu-Natal. Her research interests lie at the intersection of machine learning, artificial intelligence, and natural language processing, with a special focus on large language models (LLMs), ontology learning, and automated knowledge extraction from text using deep learning architectures. Her professional experience includes research and academic roles at NUST and UKZN. Dr Zengeya has supervised postgraduate students and served as a peer reviewer for computer science journals. In addition to her research, she has supervised and examined postgraduate students in computer science and served as a peer reviewer for computer science journals. Dr Zengeya is passionate about applying AI and data science to real-world problems, including smart agriculture and educational technologies.



Session Chair: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics

Prof Raeesa Moolla

University of the Witwatersrand

Prof Raeesa Moolla is an atmospheric scientist with a PhD from the University of the Witwatersrand. Her current focus lies in hotspot monitoring and modelling of urban-scale air pollution and its impacts on human health, specifically related to VOC emissions and pollution from the transport sector. Recently, her research has also taken her into analysing communities' perceptions on air pollution, an understudied field, of great importance for the development of policies and government engagement. Prof Moolla has received funding from, amongst others, the National Research Foundation (NRF),

the Society of Environmental Geochemistry and Health, and the Royal Society of Chemistry (RSC), ETH Zurich, worth over R10 million. She has collaborations with several international agencies and universities, including researchers based at NOAA, USA; CNRS, France; the Earth System Data Exploration unit at Forschungszentrum Jülich, Germany, and local universities in South Africa. She was elected to the Scientific Steering Committee of the Tropospheric Ozone Assessment Report (TOAR) (and is the coordinating lead author for the Africa working group) and admitted as a member of the Royal Society of Chemistry. She has over 15 publications, and has been featured in Forbes (as a leading Global South scientist). She is co-author on two Nature journal manuscripts, viz Nature Communications and Nature Cities, covering key aspects of plastic waste burning and air pollution perceptions in low-income communities, respectively. She was also featured in Nature Africa Feature on air pollution monitoring and use of AI in monitoring.



Session Chair: Research Data Management, Open Data, Institutional Analytics, and Educational AI

Eleni Flack-Davison

University of the Witwatersrand

Eleni Flack-Davison is Legal Adviser, Research Compliance Manager, Head of the Office of Research Integrity, and Research Data Protection Officer at the University of the Witwatersrand, Johannesburg. She holds BA, LLB and LLM degrees and is an admitted attorney of the High Court of the Republic of South Africa. In her role within the Wits Research Office, she provides legal services and legal advice to senior university management, academics, and researchers, supporting research and innovation through research contracts, compliance guidance, research governance, and the management of legal services for research. Eleni leads the Research Integrity Office and plays a central role in strengthening research integrity, research ethics, compliance, data protection, and responsible research practice at Wits University. Her responsibilities include oversight and support for the University's research ethics structures and ethics administration. Wits has five University Research Ethics Committees covering non-medical research, medical research, animal ethics screening and control, biobanks, clinical drug trials, and institutional biosafety. Her work is therefore closely aligned with the governance of research data, ethical review, institutional accountability, and responsible knowledge production. She serves on several university management, Senate, and advisory committees at Wits University and has also been appointed as a member of the University of Bristol University Ethics of Research Committee. She is one of the founding fellows of the Wits Machine Intelligence and Neural Discovery (MIND) Institute, contributing to the responsible development of artificial intelligence, data science, and research innovation within the university ecosystem. Eleni has played an important national, regional, and international role in research integrity and research ethics. She was a special adviser to the Local Organising Committee for the 7th World Conference on Research Integrity, held in Cape Town. She is a Certified VIRT2UE Research Integrity Trainer with the Embassy of Good Science under the European Union and Amsterdam UMC. She is a member of the Executive Committee of the Research Ethics Associations of Southern Africa (REASA), where she leads the Marketing and Communications Sub-Committee, and she is a member of the African Research Integrity Network. Her broader contributions include participation in the Academy of Science of South Africa drafting processes related to the POPIA Code of Conduct for Research in South Africa and the ASSAf research ethics and integrity framework. She has co-chaired the Northern Regions Research Ethics and Integrity Community of Practice under the Southern African Research and Innovation Management Association (SARIMA) and co-chairs the Steering Committee for Communities of Practice in Research Ethics and Integrity. This work has included contributions to ethics guidelines and toolkits for the SADC region in relation to the Nagoya Protocol. Eleni is also part of the SARIMA Research Management Portfolio Committee. In 2024, she and colleagues from the SARIMA Northern Regions Community of Practice received the Anderson-Kleinert Diversity Award for their presentation titled *Indigenizing Research Management: What Does it Mean for Research Integrity*. She also received the joint

SARIMA Excellence Award for Professional Excellence in Research Management. Her leadership brings a vital research governance, ethics, integrity, compliance, and data protection perspective to ADSC 2026, particularly in relation to research data management, open data, institutional analytics, and educational artificial intelligence.



Session Chair: Statistical, Mathematical, and Computational Foundations of Data Science and AI

Professor Delson Chikobvu

University of the Free state

Professor Delson Chikobvu is an associate professor in the department of Mathematical Statistics and Actuarial Science at the University of the Free state in South Africa He holds a PhD in Mathematical Statistics, which he obtained in 2008 from the University of the Free State. He has keen interest in applied Statistics, especially modelling risky events using statistics. Research interests are in modelling the risk of dying after contracting the Aids virus, the risk that Electricity demand exceeds supply (forecasting), the risk of not having enough tourists in a country and modelling financial risk (extremal) events. He current interest is in comparing AI models with theoretical statistical models and comparing the advantages/ disadvantages of each approach. He won the 2011 Herbert Sichel medal. The Sichel medal was established in 1997 and is awarded annually to the best statistics paper published in a South African journal in the previous year. He has supervised at least 11 PhD's to completion, and 2 more are likely to hand in year 2026.

29. STUDENT REPRESENTATIVES

ADSC 2026 Delegate Support and Student Leadership

African Data Science Conference 2026

The ADSC 2026 Student Representatives form an important part of the conference support structure. They contribute to delegate assistance, session support, venue guidance, workshop coordination, registration support, timekeeping, exhibition assistance, and general on-site engagement. Their participation also reflects the conference's commitment to postgraduate development, student leadership, and the growth of the next generation of African data science and artificial intelligence scholars.



Ayomikun Adesuyi

ADSC 2026 Student Representative

Degree Programme: Master of Science in Electrical and Information Engineering
Year/Level of Study: Postgraduate, full-time
Faculty/School/Department: Faculty of Engineering and the Built Environment, Electrical and Information Engineering
Areas of Interest: Artificial Intelligence, Data Science, Embedded Systems, Healthcare Technology, Machine Learning, and Research Innovation

Ayomikun Adesuyi is a postgraduate student in Electrical and Information Engineering at the University of the Witwatersrand. His research focuses on the development of AI-based systems for healthcare applications in low-resource environments. He also serves as a teaching assistant for Microprocessors and Software Development, where he supports students in practical and programming-related activities. His interests span artificial intelligence, embedded systems, data science, healthcare technology, machine learning, and technology-driven innovation for societal impact. He is passionate about research collaboration, problem-solving, and contributing to initiatives that promote the growth of data science and artificial intelligence across Africa.



Dhruti Dheda

ADSC 2026 Student Representative

Degree Programme: PhD in Electrical and Information Engineering
Year/Level of Study: Postgraduate, full-time
Faculty/School/Department: Faculty of Engineering and the Built Environment, Electrical and Information Engineering
Areas of Interest: Deep Learning, Metaheuristic Algorithms, Machine Learning, Data Science, Hybrid Renewable Energy Systems, and Research Innovation

Dhruti Dheda is a PhD candidate in the School of Electrical and Information Engineering at the University of the Witwatersrand. Her research applies metaheuristic algorithms and deep learning to the multi-objective optimisation of hybrid renewable energy systems, with a particular focus on

embedding social equity explicitly into the optimisation process alongside technical, economic, and environmental objectives. Her research interests include deep learning algorithms and their application to environmental conservation, water quality monitoring and analysis, and carbon nanotubes. Her research has been published in IEEE Access and recognised with research awards at the Deep Learning IndabaX South Africa. Beyond her research, Dheda is Executive Postgraduate Representative of the School of Electrical and Information Engineering, Chair of the South African Institute of Electrical Engineers Wits Chapter, and founder of the African Steminist, an initiative dedicated to increasing the representation of women of colour in STEM through storytelling and advocacy, grounded in the belief that you cannot aim to become what you cannot see.



Anthony Akueche

ADSC 2026 Student Representative

Degree Programme: BSc Geospatial Sciences
Year/Level of Study: Undergraduate, final year
Faculty/School/Department: Faculty of Science, School of Geography, Archaeology, Environmental Sciences, and Geospatial Sciences
Areas of Interest: Geospatial Data Science, GIS, Artificial Intelligence, Urban Flood Vulnerability, Environmental Analytics, and African Data Science

Anthony Akueche is a final-year BSc Geospatial Sciences student at the University of the Witwatersrand. His academic interests align strongly with the aims of ADSC 2026, particularly the application of data science, geospatial analysis, and artificial intelligence to African development challenges. His research project uses GIS and AI to assess urban flood vulnerability in eThekwini, reflecting his commitment to applying data science in practical, socially meaningful, and contextually relevant ways. Anthony also serves as Chairperson of the Faculty of Science Student Council and the School of Geography, Archaeology, and Environmental Studies Council. Through these leadership roles, he has coordinated major student initiatives, including the Wits Science Mixer, which welcomed approximately 500 students. His involvement in ADSC 2026 reflects his commitment to student leadership, scientific engagement, and the advancement of African data science.



Blessing Nhlawuleko Bvuma

ADSC 2026 Student Representative

Degree Programme: Bachelor of Science (General)
Year/Level of Study: Undergraduate, third year
Faculty/School/Department: Faculty of Science, School of Animal, Plant and Environmental Science
Areas of Interest: Environmental Data Science, Biodiversity Conservation, Climate Research, Ecological Modelling, Statistical Literacy, and Evidence-Based Environmental Policy

Blessing Nhlawuleko Bvuma is a third-year Bachelor of Science student at the University of the Witwatersrand, majoring in Ecology and Biodiversity. She is passionate about leveraging data science for environmental conservation, biodiversity protection, and climate research. Her academic journey explores how analytical tools can transform ecological modelling, climate analysis, and evidence-based environmental decision-making. Blessing actively applies statistical literacy to practical field research and is particularly interested in how African-driven data solutions can address biodiversity and environmental challenges. Through her involvement in ADSC 2026, she is excited to contribute to the conference community, support delegate engagement, and learn from leading researchers shaping Africa's data science landscape. Her areas of interest include environmental data science, biodiversity

conservation, climate research, ecological modelling, and evidence-based environmental policy.



Kopano Letsela

ADSC 2026 Student Representative

Degree Programme: Doctor of Philosophy (PhD)
Year/Level of Study: Postgraduate, full-time
Faculty/School/Department: Faculty of Science, School of Statistics and Actuarial Sciences
Areas of Interest: Spatial Data Science, Geospatial Analytics, Machine Learning, Artificial Intelligence, Environmental Modeling, and Spatial Statistics

Kopano Letsela is a postgraduate student enrolling for a Doctor of Philosophy (PhD) in the fields of statistics at the University of the Witwatersrand. His research interests focus on spatial data science, geospatial analytics, machine learning, and environmental modeling, with an emphasis on understanding spatial variability through data-driven approaches. His previous research explored geographically adaptive methods such as Geographically Weighted Regression and spatial machine learning models for ecological and environmental applications. Kopano is passionate about artificial intelligence, spatial statistics, and research innovation, particularly in applying advanced analytical techniques to solve real-world environmental and societal challenges. His interests include spatial data science, AI, geospatial modeling, machine learning, and environmental analytics. Through his involvement as a student representative, he looks forward to engaging with researchers and professionals who are advancing the role of data science across Africa.



Simphiwe Makgetla

ADSC 2026 Student Representative

Degree Programme: BSc Computational and Applied Mathematics
Year/Level of Study: Third year, final year
Faculty/School/Department: Faculty of Science
Areas of Interest: Artificial Intelligence, Data Analytics, Scientific Computing, Applied Mathematics, Mathematical Modelling, and Technology Innovation

Simphiwe Makgetla is a final-year BSc Computational and Applied Mathematics student at the University of the Witwatersrand. He has a strong passion for problem-solving, leadership, innovation, and the practical use of mathematics and technology to address real-world challenges. He tutors Scientific Computing I and mentors first-year students by providing academic and career guidance. His interests include artificial intelligence, data analytics, scientific computing, applied mathematics, mathematical modelling, and technology innovation. Through his involvement in ADSC 2026, he contributes to the conference's commitment to student leadership, postgraduate pathways, and the development of future African data science talent.



Luthando Ndlovu

ADSC 2026 Student Representative

Degree Programme: Postgraduate Diploma in Science in the Field of Data Science
Year/Level of Study: Postgraduate
Faculty/School/Department: Faculty of Science, School of Computer Science and Applied Mathematics
Areas of Interest: Data Science, Data Analysis, Business Analysis, AI Engineering, Sports Analytics, and Artificial Intelligence

Luthando Ndlovu is a postgraduate student pursuing a Postgraduate Diploma in Data Science at the University of the Witwatersrand. He has a strong passion for machine learning, artificial intelligence, data analysis, and the use of data-driven methods to support decision-making in high-performance environments. Luthando has worked as a performance analyst for World Rugby, contributing to elite sporting environments involving teams such as the Springboks and the All Blacks. He currently serves as the Performance Analyst for the Wits University Rugby, Netball, and Hockey teams, where he focuses on performance insights, tactical analysis, and strategic decision support. His interests include data science, data analysis, business analysis, AI engineering, sports analytics, and artificial intelligence. Through his involvement in ADSC 2026, he brings a practical perspective on the application of data science in sport, organisational performance, and evidence-informed decision-making.



Mewzi Nkau

ADSC 2026 Student Representative

Degree Programme: Bachelor of Science in Physical Sciences
Year/Level of Study: Second year
Faculty/School/Department: Faculty of Science, School of Physics
Areas of Interest: Machine Learning, Artificial Intelligence, Economics, Financial Data Science, Statistical Modelling, Mathematics, Physics, and Youth Empowerment

Mewzi Nkau is a second-year Bachelor of Science in Physical Sciences student at the University of the Witwatersrand, currently studying Physics, Economics, and Mathematics. Although still early in his academic journey, he has a strong and growing passion for data science, artificial intelligence, machine learning, and the use of quantitative tools to understand complex real-world systems. His academic background in Mathematics and Physics has provided him with a strong quantitative foundation that is highly relevant to statistical modelling, data science, algorithmic thinking, and computational problem-solving. His studies in Economics have further strengthened his interest in how data-driven insights can inform decision-making, policy, and the future of financial systems across Africa. Mewzi is particularly fascinated by the intersection of machine learning, artificial intelligence, economics, and finance. He is interested in how intelligent systems and data science can influence financial industries, support better economic decision-making, and contribute to more inclusive and evidence-informed development across the continent. Beyond academics, Mewzi is actively involved in youth empowerment. He tutors Grade 10–12 learners in Mathematics, Physics, and Life Sciences, and also leads a team of students who support Grade 12 learners with university and bursary applications. Through this work, he contributes to expanding access to educational opportunities and helping young people prepare for their academic futures. His involvement in ADSC 2026 reflects his eagerness to learn from leading researchers, practitioners, and innovators in African data science. He sees the conference as an opportunity to gain exposure to cutting-edge work, clarify his future academic and career direction, and contribute meaningfully to a community committed to

advancing **African Data Science, for Africa**.

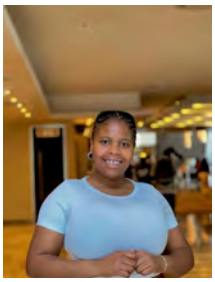


Palesa Rapolaki

ADSC 2026 Student Representative

Degree Programme: MSc Computer Science
Year/Level of Study: Master's candidate
Faculty/School/Department: Faculty of Science, School of Computer Science and Applied Mathematics
Areas of Interest: Robotics, Reinforcement Learning, Machine Learning, Multi-Agent Systems, Data Science for Socioeconomic Impact, and AI for Social Good

Palesa Rapolaki is an MSc candidate in Computer Science at the University of the Witwatersrand, based in the Robotics, Autonomous Intelligence and Learning Laboratory. Her research interests span robotics, reinforcement learning, machine learning, and the design of intelligent autonomous multi-agent systems capable of adaptive coordination in dynamic environments. Beyond her core research, Palesa is deeply interested in how data science can be leveraged to address socioeconomic challenges in South Africa. She believes that data-informed solutions have the potential to drive equitable, practical, and lasting change. She currently serves as a mentor for the Wits Mathematical Sciences Support Data Science Interest Group, where she supports data science engagement and capacity-building among undergraduate students. Her goal is to contribute to the development of a new generation of practitioners equipped to use data science and artificial intelligence meaningfully within their communities.



Mbalenhle Sithole

ADSC 2026 Student Representative

Degree Programme: Master of Science in Data Science
Year/Level of Study: Master's candidate
Faculty/School/Department: Faculty of Science, School of Computer Science and Applied Mathematics, University of the Witwatersrand
Areas of Interest: Machine Learning, Artificial Intelligence, Data Analytics, Statistical Modelling, and Predictive Analytics

Mbalenhle Sithole is a Master's candidate in Data Science at the University of the Witwatersrand, following the completion of a Postgraduate Diploma in Data Science. She has a strong interest in machine learning, artificial intelligence, statistical modelling, predictive analytics, and applied data analytics. Mbalenhle has experience in academic tutoring, predictive modelling, and dashboard development using tools such as Python, SQL, and Power BI. She is passionate about applying data science and AI to solve real-world problems and contributing to data-driven innovation that supports meaningful impact across Africa.



Jonathan Tager

ADSC 2026 Student Representative

Degree Programme: Postgraduate Diploma in Science in the Field of Data Science
Year/Level of Study: Postgraduate, full-time
Faculty/School/Department: Faculty of Science, School of Computer Science and Applied Mathematics
Areas of Interest: Data Science, Natural Language Processing, Machine Learning, Genealogy, Legacy, and Narrative Preservation

Jonathan Tager is a Postgraduate Diploma in Data Science student in the School of Computer Science and Applied Mathematics at the University of the Witwatersrand. His academic background includes undergraduate studies in applied linguistics, and his honours research focused on comparing evaluation metrics in social dialogue systems, particularly chatbots. His research interests centre on natural language processing, uncertainty and confidence in language model outputs, and the design of evaluation metrics that speak to African needs and contexts. He is particularly interested in questions of who designs AI systems, how model outputs are evaluated, and how Africa can participate actively in the AI revolution. His broader interests include machine learning applications for genealogy, legacy, and narrative preservation.



Kgosi Tsintsing

ADSC 2026 Student Representative

Degree Programme: MCom Financial Technology candidate
Year/Level of Study: Postgraduate
Faculty/School/Department: School of Economics and Finance
Areas of Interest: Machine learning, climate finance, blockchain, autonomous systems, and quantitative risk analytics

Kgosi Tsintsing is an MCom FinTech candidate at Wits School of Economics and Finance and a Research Associate on the AFRETEC project, where he explores Explainable AI (XAI) and blockchain for trustworthy autonomous systems. His Master's research investigates climate-bank-crypto spillovers using ML and agent-based simulation. He has presented a civic engagement catastrophe bond strategy for South Africa at the Global Climate Finance Conference (2025) and completed the University of Zurich Blockchain Summer School on a scholarship. With hands-on experience in ML-driven credit risk scorecards and banking data, he works at the intersection of XAI, blockchain, and quantitative risk analytics. As an ADSC 2026 Student Representative, he looks forward to helping create a professional, welcoming environment for Africa's data science community.

30. WORKSHOP ABSTRACTS

African Data Science Conference 2026

Pre-conference workshops | Tuesday, 23 June 2026 | New Commerce Building

The ADSC 2026 pre-conference workshops provide focused, practice-oriented learning opportunities for researchers, postgraduate students, practitioners, industry professionals, and institutional stakeholders. The workshops are designed to complement the scientific programme by offering hands-on exposure, conceptual grounding, methodological development, and professional skills relevant to contemporary data science, artificial intelligence, research practice, and innovation in African contexts.

Quantum Machine Learning and Data Science

Facilitator: Dr Isaac Nape
University of the Witwatersrand

Abstract

This workshop provides a practical introduction to why quantum computers may one day become useful tools for data science and machine learning. Many modern learning tasks involve searching through extremely large spaces of possible patterns, models, correlations, or transformations. Quantum computers offer a different way of processing information, where data is represented in physical quantum states and manipulated using quantum operations. Rather than treating quantum computing as a mysterious black box, the workshop introduces quantum ideas through concepts familiar to data scientists, including vectors, matrices, feature spaces, correlations, optimisation, and model training. Quantum states can be understood as high-dimensional vectors, while quantum circuits act as structured transformations on these vectors. Through superposition, quantum systems can represent information across many possible configurations, while entanglement allows correlations between variables to be encoded in ways that are difficult to reproduce classically. These properties suggest that quantum machines could eventually become useful for selected complex computational and learning tasks. Building on this foundation, the workshop will walk participants through key concepts in machine learning with quantum machines, with a strong focus on practical implementation. Participants will explore how classical data can be encoded into a quantum computer, how quantum circuits can be designed to mimic deep neural networks using variational quantum algorithm approaches, and how useful information can be extracted through measurement and data readout. The practical workflow will include quantum data encoding, circuit ansatz design, optimisation strategies, and hyperparameter tuning, before applying these ideas to a simple image classification problem. The workshop will conclude with a group activity focused on the potential benefits, limitations, and open questions surrounding machine learning with quantum technologies.

Key focus areas

- Why quantum computing may become relevant for data science, machine learning, and optimisation.
- How quantum states, quantum circuits, superposition, and entanglement can be understood using vectors, matrices, feature spaces, and correlations.

- How classical data can be encoded into quantum systems for learning tasks.
- How variational quantum algorithms can be used to design quantum circuits that resemble trainable machine learning models.
- Practical steps in quantum data encoding, circuit ansatz design, optimisation, measurement, data readout, and hyperparameter tuning.
- Application of quantum machine learning ideas to a simple image classification problem.
- Critical reflection on the benefits, limitations, and open research questions in quantum machine learning.

Intended audience

Postgraduate students, researchers, data scientists, statisticians, computer scientists, engineers, and practitioners interested in emerging computational paradigms, quantum technologies, optimisation, machine learning, image classification, and future-facing data science methods.

Machine Learning and Artificial Intelligence in Healthcare

Facilitators: Prof Innocent Maposa, Dr Yusentha Balakrishna, Dr Isaac Singini, and Mr Siyabonga Mavundla

Stellenbosch University; South African Medical Research Council

Abstract

This workshop explores the role of machine learning and artificial intelligence in healthcare, with attention to clinical, public health, biomedical, epidemiological, and health-system applications. The workshop brings together expertise from Stellenbosch University and the South African Medical Research Council, combining perspectives from biostatistics, epidemiology, public health research, statistical modelling, machine learning, and applied health analytics. Participants will engage with the opportunities and limitations of AI-driven healthcare analytics, including predictive modelling, classification, risk stratification, decision support, surveillance, ethical considerations, data quality, interpretability, bias, and implementation challenges in resource-constrained environments. The workshop will also foreground the importance of responsible, context-sensitive, and evidence-informed AI for healthcare in Africa, where data limitations, health inequalities, infrastructure constraints, and public health priorities require careful methodological and ethical attention. The session is designed to support practical understanding of how machine learning and artificial intelligence can be applied to healthcare and biomedical data while maintaining strong statistical reasoning, responsible interpretation, and awareness of real-world implementation challenges.

Key focus areas

- Machine learning workflows for healthcare, biomedical, epidemiological, and public health data.
- Predictive modelling, classification, risk estimation, and decision-support tools in health contexts.
- Statistical modelling, biostatistical reasoning, and responsible interpretation of health data.
- Data quality, missing data, bias, fairness, interpretability, ethics, and governance in healthcare AI.
- Applications in clinical research, public health surveillance, biomedical analytics, and health-system planning.
- Practical implementation issues for healthcare AI in African and resource-constrained

settings.

Intended audience
Health researchers, data scientists, postgraduate students, clinicians, biostatisticians, epidemiologists, public health professionals, biomedical analysts, policymakers, and delegates interested in responsible and context-sensitive machine learning and artificial intelligence for healthcare.

Internet Connectivity and Computing as Enablers of Artificial Intelligence

Facilitators: Dr Songezo Soso Mata and the ICASA Team
Independent Communications Authority of South Africa

Abstract
This workshop examines the foundational role of internet connectivity, computing infrastructure, spectrum management, quality of service, data governance, privacy, and regulation in enabling artificial intelligence readiness. While many AI discussions focus on models, algorithms, data, and applications, this workshop foregrounds the digital and regulatory infrastructure required for AI systems to be developed, deployed, governed, and accessed in ways that are reliable, inclusive, and responsible. The session will highlight the role of the Independent Communications Authority of South Africa in supporting AI readiness through regulatory leadership in areas such as spectrum licensing, connectivity, quality of service, digital infrastructure, data-related considerations, and public-interest regulation. It will explore how connectivity and computing capacity influence AI adoption, innovation, public-sector transformation, business competitiveness, research development, digital inclusion, and national readiness for emerging technologies. The workshop is designed as an interactive policy, infrastructure, and regulatory conversation rather than a coding-based tutorial. It will include a main presentation led by ICASA, followed by a question-and-answer session, facilitated discussion, optional group or breakout engagement, feedback, reflections, and possible action points. Participants will be invited to consider how regulation, connectivity, computing, privacy, infrastructure investment, and institutional coordination can support responsible and inclusive AI development in South Africa and across the African continent.

Key focus areas
- Internet connectivity and computing infrastructure as foundations for AI readiness.
- Spectrum licensing, quality of service, and communications regulation in the AI ecosystem.
- Data governance, privacy, trust, and public-interest considerations in AI-enabled environments.
- The role of regulators, government, academia, industry, and civil society in enabling responsible AI.
- Connectivity, digital inclusion, and the infrastructure requirements for African AI innovation.
- Group discussion on practical next steps for strengthening AI readiness through infrastructure and regulation.

Intended audience
Researchers, postgraduate students, policymakers, regulators, data scientists, AI practitioners, ICT professionals, public-sector stakeholders, industry leaders, digital infrastructure specialists, and delegates interested in the enabling conditions for responsible artificial intelligence in African contexts.

From Data to Discovery: Publishing in Top-Tier Journals, Research Data Management, and Open Research Impact

Facilitators: Prof Moinak Maiti, Maria Cotera, and the Wits Libraries / Wits Open Data Vault Team

University of the Witwatersrand; Figshare

Abstract

This workshop brings together three closely connected dimensions of scholarly impact: publishing strategically in high-quality journals, managing research data responsibly, and increasing the visibility and reuse of research outputs through open research infrastructure. Under the theme *From Data to Discovery: Publishing in Top-Tier Journals, Research Data Management, and Open Research Impact*, the session will guide participants across the research lifecycle, from the development of publishable manuscripts to the curation, deposit, sharing, and tracking of research datasets. The publishing component, led by Prof Moinak Maiti, will focus on how researchers can position manuscripts for reputable and high-impact journals. Participants will engage with practical issues such as journal selection, manuscript framing, contribution statements, methodological clarity, reviewer expectations, revision strategies, editorial decision-making, publication ethics, and the professional management of the peer-review process. The research data management and open research component will introduce participants to responsible data practices, including data documentation, metadata, preservation, reproducibility, data sharing, and institutional support for open scholarship. Maria Cotera from Figshare will present on *Figshare for Data*, highlighting repository infrastructure and services available to South African institutions and individual researchers. This component will demonstrate how repositories can support open research, data citation, discoverability, compliance, collaboration, and long-term research visibility. The Wits Libraries / Wits Open Data Vault Team will showcase the Wits Open Data Vault, including dataset curation processes, institutional data stewardship, and the visibility metrics associated with more than 10,000 datasets using platforms such as Dimensions and Altmetric. This demonstration will show how well-curated datasets can become recognised research outputs in their own right, strengthening both individual researcher profiles and institutional research visibility. The workshop will also include a practical component titled *Bring Your Dataset to Deposit Live*. Delegates will have an opportunity to work through the process of depositing a personal dataset either in their institution's Figshare repository or in Figshare.com, the free repository available to individual researchers. Participants are encouraged to bring a dataset where appropriate, together with relevant documentation, metadata, ethical clearance, and sharing permissions.

Key focus areas

- Positioning manuscripts for reputable, high-quality, and top-tier journals.
- Understanding peer review, revision strategies, contribution framing, and editorial expectations.
- Strengthening publication quality through methodological clarity, ethical scholarship, and strategic journal selection.
- Research data management planning, documentation, metadata, preservation, and responsible data stewardship.
- Open data, reproducibility, dataset citation, responsible sharing, and institutional research support.
- Figshare as repository infrastructure for open research in South Africa and beyond.
- Wits Open Data Vault, dataset curation, and visibility metrics using Dimensions and Altmetric.

- Practical live deposit of a dataset in Figshare or an institutional repository.

Intended audience
Postgraduate students, early-career researchers, supervisors, academics, research managers, librarians, data stewards, journal authors, and scholars seeking to improve publication quality, strengthen research data practices, and increase the visibility, accessibility, and impact of their research outputs.

Introduction to Spatial Data Science

Facilitator: Prof Inger Fabris-Rotelli
University of Pretoria

Abstract
This workshop introduces participants to the foundations and applications of spatial data science. It will explore how spatial thinking, statistical methods, geographic information systems, and data science tools can be used to analyse location-based patterns and processes. The session will highlight the importance of spatial data for environmental monitoring, public health, urban analytics, remote sensing, and evidence-informed decision-making.

Key focus areas
- Foundations of spatial data, spatial dependence, and geographic variation.
- Introduction to spatial statistics and spatial data science workflows.
- Applications in public health, environment, urban systems, and remote sensing.
- Interpreting spatial patterns for decision-making and policy relevance.

Intended audience
Postgraduate students, statisticians, geographers, public health researchers, environmental analysts, urban researchers, data scientists, and practitioners working with location-based or spatially referenced data.

Beyond Vibe Coding: Building Trustworthy Data Science with LLM Agents

Facilitators: Naweed Khan and Dr Ndivhuwo Makondo
IBM Research Africa

Abstract
This workshop examines how large language models and agentic AI systems can support trustworthy, reproducible, and responsible data science workflows. Moving beyond informal experimentation, the session will introduce structured approaches for using LLM agents in coding, documentation, analysis, workflow automation, validation, and collaboration. Emphasis will be placed on reliability, governance, human oversight, and practical safeguards for responsible AI-assisted data science.

Key focus areas
- LLM agents for data science workflows, coding, and analysis support.
- Prompting, tool use, workflow orchestration, and human-in-the-loop design.
- Trustworthiness, reproducibility, evaluation, and responsible AI safeguards.
- Practical approaches for moving from experimentation to reliable implementation.

Intended audience
Data scientists, AI practitioners, software developers, postgraduate students, researchers, analysts, and professionals interested in responsible and practical use of LLMs and AI agents.

31. WORKSHOP FACILITATOR BIOGRAPHIES

African Data Science Conference 2026

Facilitator profiles for the pre-conference workshops

The ADSC 2026 workshop facilitators bring together expertise from universities, research institutions, industry, and innovation ecosystems. Their collective experience spans quantum technologies, healthcare analytics, spatial statistics, research data management, scholarly publishing, large language models, trustworthy AI, computational modelling, and industry-facing data science.



Dr Isaac Nape

University of the Witwatersrand

ADSC 2026 Workshop Facilitator

Dr Isaac Nape is an internationally recognised quantum scientist whose work has contributed significantly to the development of quantum technologies in South Africa. His research spans quantum optics, structured light, quantum communication, quantum imaging, and the use of quantum light for secure information processing and advanced optical systems. At the age of 29, Dr Nape had already received 15 awards for scientific excellence and innovation, including international recognition from leading optical and photonics societies. He has also represented South Africa at the Global Young Scientists Summit in Singapore, an international gathering that brings together exceptional young scientists from around the world to engage with distinguished researchers and Nobel laureates. Dr Nape completed his BSc in Physics at the University of Pretoria, followed by a BSc Honours in Physics, awarded cum laude. He then completed an MSc, also cum laude, and a PhD in Physics at the University of the Witwatersrand. After completing his doctorate, he joined the academic staff in the School of Physics at Wits, becoming one of the youngest lecturers in the department. His research has appeared in some of the world's leading scientific journals, including *Nature Photonics*, *Nature Communications*, *Science Advances*, *Optica*, and *Laser & Photonics Reviews*. His work has attracted international attention for contributions such as new methods for imaging through transparent objects using quantum light, techniques for characterising high-dimensional quantum states of light, approaches for transmitting quantum light through optical fibres, and advances in understanding how light can remain robust against distortions through insights from quantum mechanics. Beyond his scientific publications, Dr Nape has been recognised for his potential to translate frontier science into technologies that can support South Africa's future development. He received the Emerging Leader Award from the South African Quantum Initiative and a competitive grant from the Department of Science and Innovation to advance his research in quantum technologies. He was also awarded the SPIE Educational Scholarship during his doctoral studies, an international award given to students with strong potential for long-term contributions to optics and photonics. Dr Nape is deeply committed to science communication and youth development. He regularly engages with schools and young learners, using his own journey to inspire the next generation of scientists. His broader vision is to see South Africa become a global hub for knowledge creation, technology development, and quantum innovation. He is particularly interested in supporting the development of local expertise and future companies capable of producing quantum technologies that address major societal challenges,

including the sustainable development goals.



Prof Innocent Maposa

Stellenbosch University

ADSC 2026 Workshop Facilitator

Prof Innocent Maposa is a distinguished biostatistician and data scientist with nearly 15 years of academic and research experience. He holds a PhD in Statistics from the University of the Western Cape and brings a strong foundation in mathematics to his interdisciplinary work. An NRF C-rated scientist with more than 60 peer-reviewed publications, Prof Maposa works at the critical intersection of biostatistics, epidemiology, and data science, contributing significantly to methodological and applied research in global health and population studies. His scholarship reflects a deep commitment to rigorous quantitative science in service of public health and development challenges. He currently serves as the Biostatistics Programme Lead at Stellenbosch University, within the Division of Epidemiology & Biostatistics in the Global Health Department. In this role, he contributes to postgraduate training, research capacity development, and the advancement of statistical science in health research across Africa. Prof Maposa is an active member of leading international statistical bodies, including the International Biometrics Society, and regularly serves as an external examiner for top universities across South Africa and Sub-Saharan Africa. His involvement in ADSC 2026 strengthens the conference's expertise in health data science, statistical methodology, and interdisciplinary research.



Dr Yusentha Balakrishna

South African Medical Research Council

ADSC 2026 Workshop Facilitator

Dr Yusentha Balakrishna is a Specialist Statistician in the Biostatistics Research Unit at the South African Medical Research Council. She holds a Doctor of Philosophy degree in Statistics from the University of KwaZulu-Natal, completed in 2023, where her research focused on the analysis of food composition data using Gaussian mixture models to determine food classes. Dr Balakrishna has more than 12 years of experience as a statistician across a wide range of health-related studies, including women's health, environmental health, non-communicable diseases, and nutrition. Her statistical interests include multivariate analysis, high-dimensional data analysis, meta-analysis, and the application of advanced quantitative methods to complex biomedical and public health data. She has authored and co-authored more than 50 peer-reviewed publications and actively presents her research at local and international conferences. Her work reflects a strong commitment to statistical rigour, reproducible analysis, and evidence-informed health research. She also contributes to statistical capacity development through introductory biostatistics training and specialised courses in meta-analysis. In addition to her research and training roles, Dr Balakrishna serves as an Associate Statistical Editor for *BMJ Evidence-Based Medicine* and is a member of the SAMRC Ethics Committee for Research on Animals. Her involvement in ADSC 2026 strengthens the conference's focus on biostatistics, health data science, evidence synthesis, statistical modelling, and public health analytics

in African research contexts. At ADSC 2026, Dr Balakrishna, together with Dr Isaac Singini and Mr Siyabonga Mavundla from the South African Medical Research Council, will contribute to the workshop on *Machine Learning and Artificial Intelligence in Healthcare*. Their contribution will bring applied biostatistical expertise, public health research experience, and practical perspectives on data quality, predictive modelling, evidence synthesis, ethical interpretation, implementation challenges, and the responsible translation of AI and machine learning methods into African healthcare, biomedical research, and public health decision-making contexts.



Dr Isaac L. Singini

South African Medical Research Council

ADSC 2026 Workshop Facilitator

Dr Isaac L. Singini is a Specialist Biostatistician at the South African Medical Research Council, with more than 15 years of experience in biostatistics, epidemiology, and public health research. His work focuses on advanced statistical modelling for health data, particularly longitudinal models, survival analysis, and joint models for longitudinal and time-to-event outcomes, with applications in HIV, tuberculosis, COVID-19, and other infectious diseases. Dr Singini holds a PhD in Statistical Sciences from the University of Cape Town, where his research focused on diagnostics for joint models for longitudinal and survival data. He also holds an MSc in Medical Statistics from the University of London and completed postgraduate training at the London School of Hygiene & Tropical Medicine. His professional experience includes research and academic roles at Stellenbosch University, the University of Pretoria, Johns Hopkins University collaborative research programmes, and consultancy work with the World Health Organization during the COVID-19 pandemic. He has extensive experience supporting clinical trials, surveillance systems, implementation research, and international collaborative health research networks across Africa and beyond. His work contributes to the design, analysis, and interpretation of complex public health studies, with particular attention to methodological quality, data governance, and the translation of statistical evidence into public health decision-making. In addition to his research contributions, Dr Singini has supervised and examined postgraduate students in biostatistics and epidemiology, contributed to methodological development in joint modelling, served on the Stellenbosch University Health Research Ethics Committee, and acted as a peer reviewer for statistical and medical journals. His interests include clinical trial methodology, causal and longitudinal inference, survival analysis, data governance, and the application of advanced statistical methods to public health decision-making. His contribution to ADSC 2026 strengthens the conference's focus on health analytics, biostatistical modelling, epidemiological methods, and evidence-based public health practice.



Siyabonga Mavundla

South African Medical Research Council

ADSC 2026 Workshop Facilitator

Siyabonga Mavundla is a Junior Statistician in the Biostatistics Research Unit at the South African Medical Research Council, where he provides research and statistical support for public health studies. His work contributes to the analysis, interpretation, and reporting of health data, supporting evidence

generation for biomedical and public health research. Before joining his current role, Siyabonga served as a Lecturer at Richfield Graduate Institute, where he taught Statistics, Data Science, Mathematics, and Python Programming. This teaching experience reflects his strong commitment to quantitative education, applied data skills, and the development of future analysts and data science practitioners. He also completed a Data Analyst internship at the South African Medical Research Council within the Gender and Health Research Unit, where he gained experience in applied health research, data analysis, and research support in public health contexts. He holds a Bachelor of Science degree in Computer Science and Statistics, as well as an Honours degree in Statistics, both from the University of Zululand. Siyabonga's interests lie at the intersection of statistics, data science, programming, public health research, and applied analytics. His involvement in ADSC 2026 contributes to the conference's emphasis on statistical capacity-building, practical data analysis, public health data science, and the development of emerging African data science professionals.



Prof Moinak Maiti

University of the Witwatersrand

ADSC 2026 Workshop Facilitator

Prof Moinak Maiti is a financial data science researcher working at the intersection of academia, industry, and policy. His work focuses on advancing innovation in financial markets, strengthening financial systems, and shaping the future of intelligent finance. His contributions extend to global policy platforms, including participation as a G20 Presidency delegate on financial innovation through the TechSprint initiative, as well as engagement in international climate policy dialogues involving central bank governors. He is a Fellow of the South African Reserve Bank and Fudan University, reflecting his sustained commitment to linking frontier research with practical, policy-relevant solutions that advance inclusive and sustainable finance. His research spans artificial intelligence, machine learning, fintech, digital finance, data science, interdisciplinary studies, and climate-linked financial intelligence. Prof Maiti's work has been supported by competitive grants and research collaborations involving institutions such as the World Bank, WTO Studies, PEP Canada, the Max Planck Society in Germany, the African Engineering and Technology Network, the National Research Foundation of South Africa, the South African Reserve Bank, the Competition Commission of South Africa, the Russian Science Foundation, and other international research bodies. His research has informed policy discussions and received global media visibility. In academic publishing, Prof Maiti serves as Editor of the *Investment Analysts Journal*, published by Taylor & Francis, and as Associate Editor for several leading international journals published by Wiley, Elsevier, SAGE, and Springer Nature. His editorial leadership has been recognised through the Springer Nature Editor of Distinction Award, highlighting his contribution to advancing global research excellence. Beyond research and publishing, Prof Maiti is deeply committed to capacity development. He co-designed a pioneering Master's programme in Financial Technology, aimed at preparing the next generation of professionals with the analytical, technological, and strategic skills needed to navigate an evolving financial ecosystem. He also collaborates closely with fintech start-ups, central banks, and financial institutions, ensuring that academic insight is translated into meaningful real-world outcomes. At ADSC 2026, Prof Maiti's workshop contribution focuses on helping researchers position their work for high-quality journals, strengthen manuscripts, understand reviewer expectations, and approach the publication process strategically, ethically, and professionally.



Dr Songezo Soso Mata

Independent Communications Authority of South Africa

ADSC 2026 Workshop Facilitator

Dr Songezo Soso Mata is a Specialist in Spectrum Management and Monitoring within the Engineering and Technology Division of the Independent Communications Authority of South Africa. His work engages with the technical, regulatory, and infrastructure dimensions of communications systems, including spectrum management, monitoring, connectivity, quality of service, and the broader enabling conditions required for digital transformation. At ADSC 2026, Dr Mata contributes to the workshop on *Internet Connectivity and Computing as Enablers of Artificial Intelligence*. The workshop foregrounds the importance of digital infrastructure, spectrum regulation, connectivity, computing capacity, data governance, privacy, and public-interest regulation in shaping South Africa's and Africa's readiness for artificial intelligence. His contribution brings a vital regulatory and infrastructure perspective to the conference. It highlights that responsible AI development depends not only on algorithms, data, and models, but also on the communications infrastructure, governance frameworks, policy environments, and institutional coordination required to make AI accessible, reliable, inclusive, and socially beneficial. The ICASA team brings regulatory, technical, policy, and public-interest expertise to ADSC 2026. Their contribution focuses on the role of communications regulation, spectrum licensing, quality of service, digital infrastructure, connectivity, data governance, privacy, and institutional coordination in enabling artificial intelligence readiness. Through this workshop, ICASA contributes an essential perspective to the conference theme, **African Data Science, for Africa**. The session highlights that inclusive and responsible AI development requires more than advanced models and analytical tools; it also depends on reliable connectivity, accessible computing infrastructure, appropriate regulation, public trust, and coordinated action across government, industry, academia, and civil society. The ICASA-led workshop provides delegates with an opportunity to reflect on how digital infrastructure and regulatory leadership can support innovation while protecting the public interest. It also creates space for dialogue on how South Africa and the broader African continent can prepare for AI futures that are technically capable, ethically grounded, economically enabling, and socially inclusive.



Prof Inger Fabris-Rotelli

University of Pretoria

ADSC 2026 Workshop Facilitator

Prof Inger Fabris-Rotelli is a full professor in the Department of Statistics, University of Pretoria. She has been at the Department of Statistics since 2004, achieving her PhD Mathematical Sciences in 2013. She has supervised 85 honours, 32 Masters and 8 PhD students to completion, and is currently supervising 10 honours, 6 Masters and 7 doctoral students, and has a particular passion for postgraduate supervision. She has published 50 peer-reviewed journal articles, 33 peer-reviewed conference proceedings papers and 1 book chapter. She was on the executive of the South African Statistical Association (SASA) from 2012 – 2018, 2023-current, and from 2019-2024 sat as a director on the ICCSSA (Institute of Certificated and Chartered Statisticians in South Africa) board. She was the immediate past-president of SASA and CEO of ICCSSA in 2025. She is a SACNASP council member elected 2021 – 2029 as well as a SACNASP registered scientist. Her research interests are in spatial statistics and GIS, as well as remote sensing and general image processing, including spatial

epidemiology and criminology. She has a number of countrywide research collaboration group, namely SEPIMOD (Spatial Epidemiological Modelling) and StatSNetSA (a capacity development research group for building doctoral supervision skills in academic Statistics in South Africa and further in general supporting the young academics in Statistics in South Africa). Both these groups have resulted in a number of publications, postgraduate student growth and young academic development. She has a National Research Foundation Y2 rating in recognition of her research. Prof Fabris-Rotelli is an Abe Bailey Fellow (2007 tour award), is a 2018 fellow of the TUKS Young Researcher Leadership Program (TYRLP), and was selected as a BRICS Young Scientist 2020 in Artificial Intelligence. She received the University of Pretoria Exceptional Young Researcher award in 2023. At ADSC 2026, her workshop introduces participants to spatial data science as a powerful framework for analysing location-based patterns, understanding spatial dependence, and supporting evidence-informed decision-making across health, environment, urban systems, remote sensing, and policy-relevant applications.



Naweed Khan

IBM Research Africa

ADSC 2026 Workshop Facilitator

Naweed Khan is a Staff Research Scientist and Master Inventor in the AI team at IBM Research - Africa. He is a recipient of IBM's Research Accomplishment award, with work focusing on enhancing core machine learning algorithms, computational framework implementation and infrastructure development. He develops tools that push the boundaries in Agentic AI for Data. Naweed obtained his MEng in Robotics and Image processing at the University of Johannesburg, where he also holds a BSc in Computer Science. At ADSC 2026, he contributes expertise on how LLM agents can support data science workflows while maintaining appropriate safeguards around evaluation, accountability, governance, and responsible use.



Dr Ndivhuwo Makondo

IBM Research Africa

ADSC 2026 Workshop Facilitator

Dr Ndivhuwo Makondo is a Research Scientist and Manager at IBM Research Africa, based in the South Africa Lab. He leads a team of research scientists and software engineers conducting foundational and applied research at the intersection of knowledge representation, reasoning, learning, natural language processing, and natural language understanding. His team develops AI systems that contribute to IBM Research's global strategy while also localising advanced technologies and expertise through partnerships across the African continent. His research interests include neuro-symbolic AI, learnable reasoning, natural language understanding, robotics, computational intelligence, and the integration of AI methods into scientific and business applications. Prior to his current role, he served as a sub-theme lead for Learnable Reasoning in IBM Research's Neuro-Symbolic AI group. Dr Makondo is also a Visiting Researcher in the School of Computer Science and Applied Mathematics at the University of the Witwatersrand, where he is affiliated with the Robotics, Autonomous Intelligence and Learning Laboratory. He serves on the working group on Recommendations Towards the Development of the National AI Strategy of South Africa under the National Advisory Council on Innovation at the Department of Science, Technology and Innovation. Within this structure, he chairs

the Research and Innovation sub-committee. He holds a PhD in Computational Intelligence and Systems Science from the Institute of Science Tokyo, formerly Tokyo Institute of Technology, in Japan. He also holds an MSc specialising in Robotics and a BSc in Electrical Engineering from the University of Cape Town. His doctoral research focused on learning-based approaches to the kinematic and dynamic control of robot manipulators, while his master's research explored kinematic modelling and planning for robot manipulators used in underground mining safety inspections. Before joining IBM Research in 2019, Dr Makondo worked as a robotics researcher at the Mobile Intelligent and Autonomous Systems Laboratory at the Council for Scientific and Industrial Research in South Africa. There, he led a team conducting foundational and applied research on the deployment of mobile robot manipulators in unstructured and dynamic environments. He has also served as a Senior Research Associate in the Department of Electrical and Electronic Science at the University of Johannesburg. Dr Makondo is a senior member of the South African Institute of Electrical Engineers and the Institute of Electrical and Electronics Engineers. His achievements include the Golden Key International Honour Award, the CSIR MSc Studentship Scholarship, the Japanese Government MEXT PhD Scholarship, the Google Travel Award Asia, the NRF Thuthuka Post-PhD Grant, and IBM's Research Bronze Research Accomplishment Award. He has contributed to several international conferences and workshops, including the Neuro-Symbolic Agents Workshop at IJCAI, the Robotics and Automation Workshop at the Deep Learning Indaba, RAPDASA, Deep Learning IndabaX South Africa, the SAIEE Computing Chapter, and the IEEE International Conference on Robotics and Automation ICRA@40 Africa satellite conference. At ADSC 2026, Dr Makondo contributes expertise in trustworthy AI, neuro-symbolic reasoning, AI systems development, natural language understanding, robotics, and applied research translation. His work reflects a strong commitment to building AI technologies that are scientifically rigorous, contextually relevant, and responsive to African research and innovation priorities.



Kayleigh Lino

Head of Project Services, Digital Science

ADSC 2026 Workshop Facilitator

Kayleigh Lino is Head of Project Services at Digital Science, where she oversees a team of specialists delivering the implementation of Figshare and Symplectic Elements solutions globally. Having previously managed digital collections repositories at a university library, Kayleigh has over 14 years of experience facilitating digitisation initiatives and open research publishing.



Maria Cotera

Research Workflow Solutions Manager, Academic, Digital Science

ADSC 2026 Workshop Facilitator

Maria Cotera is a former academic librarian with a library degree from University of Granada, Spain, and an Open Science advocate. She joined Figshare at Digital Science in March 2022 and currently works as the Research Workflow Solutions Manager for Europe, the Middle East and Africa, supporting academic institutions to adopt solutions supporting open science practices. These solutions include Figshare open access repositories.



Lazarus G. Matizirofa

Associate Director: Research, Scholarly Communication, Digital Systems & Services, University of the Witwatersrand - Libraries

ADSC 2026 Workshop Facilitator

Lazarus Matizirofa is an open science advocate at the University of the Witwatersrand (WITS), South Africa, with a strong footprint across Africa. He was a member of the South Africa–EU Open Science Roadmap Steering Committee and is the recipient of the ORCID Global Participation Fund (2026), recognized for advancing researcher visibility and open science practices. Internationally, he contributes as a global advisory member of Open Repositories, the Networked Digital Library of Theses and Dissertations (NDLTD), the Digital Preservation Coalition — where he also serves on the Advocacy & Community Engagement (ACE) Subcommittee, and Digital Humanities Now. His work reflects a deep commitment to strengthening digital scholarship and open knowledge infrastructures worldwide.

32. PANEL ABSTRACTS

African Data Science Conference 2026

High-level conversations on governance, education, scientific frontiers, and business transformation

The ADSC 2026 panel sessions create space for focused, high-impact conversations on some of the most important questions shaping data science and artificial intelligence in Africa. The panels bring together academic, legal, technical, industry, educational, and strategic perspectives, connecting scholarly research with institutional practice, policy debate, business transformation, and societal relevance. Together, the panels reflect the conference theme, **African Data Science, for Africa**, by foregrounding questions of responsibility, capacity, innovation, implementation, and continental relevance.

PANEL ABSTRACTS

Featured ADSC 2026 Panels

Panel 1: Governing African Data Science
Accountability, Sovereignty, and the Architecture of Responsible AI

Chair: Dr Nomalanga Mashinini

Day One, Wednesday 24 June 2026 | 14:45–16:00

Panel Abstract

The rapid acceleration of artificial intelligence and data science across African contexts has outpaced the development of governance frameworks capable of managing risk, distributing benefits equitably, and anchoring AI deployment in African values and priorities. Across the continent, governments, institutions, and corporations are making consequential decisions about data collection, algorithmic training, AI deployment, and digital infrastructure, often amid uneven regulatory capacity, limited technical resources, and insufficient public participation. This panel will examine the governance of African data science through the lenses of accountability, sovereignty, responsible AI, institutional practice, and financing. It will bring together perspectives from law, policy, research, industry, philanthropy, and social investment to ask how African institutions can shape governance frameworks that are technically credible, socially responsible, publicly accountable, and grounded in African development priorities.

Discussion themes

- Data sovereignty, national AI policy, data protection legislation, and the African Union Continental AI Strategy.
- Accountability for AI systems deployed in high-stakes domains such as finance, retail, health, labour, and public services.
- Governance practice, institutional capacity, anticipatory governance, public participation, and African agency in global AI governance.
- The political economy and financing of African data and AI ecosystems, including philanthropy, social investment, domestic resourcing, and shifting development funding.
- Corporate AI governance, public-interest innovation, responsible deployment, human

oversight, verification, and trust.
- The role of African universities in producing data scientists who are not only technically capable, but also governance-literate.

Expected contribution

The panel will help delegates develop a sharper conceptual vocabulary for AI and data governance in African contexts. It will identify points of alignment and tension across legal, policy, research, industry, and financing perspectives, while foregrounding African governance expertise within a technical data science conference. The discussion will model the interdisciplinary integration required for responsible, sovereign, and socially accountable data science in Africa.

Panel 2: Data Science Education in the Age of AI

Chair: Dr Pravesh Ranchod

Day Two, Thursday 25 June 2026 | 14:45–16:00

Panel Abstract

Data science education stands at a crossroads. The rapid rise of artificial intelligence tools has transformed not only what we teach, but also how we teach it. These tools offer unprecedented opportunities for personalised instruction, automated feedback, scalable academic support, and expanded access to data science learning, while simultaneously disrupting traditional approaches to assessment, curriculum design, and student evaluation. When a language model can complete a typical coding, data analysis, or modelling assignment in seconds, educators must rethink what is being assessed, what counts as evidence of learning, and how students can demonstrate genuine understanding. This panel brings together perspectives from across the data science education landscape to examine how curricula, pedagogy, assessment, and training pathways must evolve in response to a field being reshaped by artificial intelligence and automation.

Discussion themes

- Rethinking curriculum design, pedagogy, and assessment in the age of artificial intelligence.
- Defining what a data scientist should know across mathematics, statistics, computer science, domain knowledge, ethics, and communication.
- Balancing accessibility, employability, practical skills, rigour, depth, and conceptual foundations.
- Understanding the appropriate level of abstraction for different learners, career paths, and institutional contexts.
- Preparing students to recognise when tools fail, when results mislead, and when assumptions break down.

Expected contribution

The panel will contribute to a critical conversation on how African universities and training institutions can prepare the next generation of data scientists for a profession being transformed by artificial intelligence, automation, and the changing demands of the future of work. Panellists will debate how to balance tool-based proficiency with foundational understanding, and how to build educational pathways that are inclusive, rigorous, employability-oriented, and responsive to Africa's data-driven future.

Panel 3: Emerging Advances in Data Science

Chair: Prof Daniel Nicolas Wilke

Day Three, Friday 26 June 2026 | 09:50–10:45

Panel Abstract

This panel brings together perspectives from quantum computing, machine learning, control and automation, banking, industry research, consulting, engineering, and academia to discuss emerging advances in data science. The aim is not to make these views converge, but to let them converse. Each panellist will share an authentic and sector-grounded view of how data science is changing their field, where its promise is strongest, and where its risks, constraints, and responsibilities are most visible. The discussion recognises that different sectors adopt new methods in different ways because their opportunities, cultures, infrastructures, regulatory environments, and implementation pressures are different. Rather than treating data science as a single uniform practice, the panel will explore it as a shared field shaped by distinct sector realities, from frontier computation and machine learning to automation, financial services, industrial systems, and real-world deployment.

Discussion themes

- Sector-specific perspectives on emerging advances in data science, artificial intelligence, machine learning, and computational methods.
- Quantum computing, optimisation, control and automation, banking analytics, industrial systems, and academic research frontiers.
- Opportunities, constraints, risks, responsibilities, and adoption patterns across different organisational and disciplinary contexts.
- Data science as a shared field shaped by diverse sector realities, practical implementation pressures, and evolving societal expectations.

Expected contribution

The panel will position ADSC 2026 as a space for open, cross-sector dialogue on the future of data science. By allowing different perspectives to converse rather than converge, the session will highlight how methodological advances gain meaning through the environments in which they are developed, adopted, governed, and applied.

Panel 4: AI for Business Transformation *From Experimentation to Scaled Impact*

Chair: Prof Rennie Naidoo

Day Three, Friday 26 June 2026 | 11:20–13:00

Panel Abstract

Artificial intelligence has rapidly moved from a specialist technical concern to a central issue for business leaders, managers, entrepreneurs, professionals, and policymakers. Many organisations are now experimenting with generative AI, machine learning, automation, predictive analytics, and AI-enabled decision support. Yet a major challenge remains: how can organisations move from isolated pilots and proofs of concept to scaled, measurable, and sustainable business impact? This academia-industry panel will explore the practical and strategic challenges involved in translating AI experimentation into business transformation. It will consider how organisations can build the leadership capabilities, data foundations, operating models, skills, organisational structures, and change management practices required to embed AI into core business processes.

Discussion themes

- Why many AI pilots fail to move beyond experimentation.
- What distinguishes successful AI initiatives from isolated proofs of concept.
- Leadership capabilities required to scale AI across an organisation.
- Measuring productivity, performance, and business value created by AI.
- Data foundations, skills, operating models, and structures needed to embed AI into core business processes.
- Lessons from financial services, consulting, telecommunications, retail, healthcare, and professional services.
- The role of business schools in preparing managers and executives to lead AI-enabled transformation.

Expected contribution

The panel will generate a practical, research-informed conversation on how businesses can move from enthusiasm and experimentation toward scaled organisational impact. It will bridge data science, information systems, business strategy, organisational leadership, and executive education, helping delegates think critically about what it will take for AI to become a meaningful driver of business transformation.

33. PANEL CHAIR BIOGRAPHIES

African Data Science Conference 2026

Chair profiles for the featured ADSC 2026 panels

The ADSC 2026 panel chairs bring together expertise in cyber law, computer science education, optimisation and computational modelling, information systems, artificial intelligence, business transformation, and digital governance. Their roles are central to shaping focused, inclusive, and intellectually rigorous conversations across the conference panels.

PANEL CHAIRS

Featured Panel Leadership



Chair: Governing African Data Science - *Accountability, Sovereignty, and the Architecture of Responsible AI*

Dr Nomalanga Mashinini

School of Law, University of the Witwatersrand

Dr Nomalanga Mashinini is a Senior Lecturer in Cyber Law at the School of Law, University of the Witwatersrand, Johannesburg, where she was appointed in August 2022. She is originally from Klerksdorp, the City of Matlosana, in the North West province of South Africa. She holds a Doctor of Laws (LLD) degree from the University of Pretoria (2022), awarded for a thesis titled "The Recognition of Image Rights in the Context of Memes Shared on Social Media", and a Postgraduate Diploma in Higher Education with distinction from Rhodes University (2023). Her research and teaching specialisation is image rights. She examines how social media and artificial intelligence drive the exploitation of people's identities, with particular attention to deepfakes, behavioural biometrics, data poisoning, post-mortem personality rights, prompt injection attacks, sharenting, malicious communications, and AI regulation. Her supervision capacity is limited to image rights, social media law, and artificial intelligence law. Nomalanga is the founder and project lead of the Wits Image Rights Engagement (WiRE), established under a Carnegie Diversifying the Academy Grant (2025). She has held National Research Foundation Thuthuka grants at PhD level (2020-2022) and post-PhD track level (2024-2026) and was awarded the Female Academic Leaders Fellowship Grant (2023). She chairs the African Cyber Law Conference and serves on the Africa AI Council's AI Talent and Skills and AI Data Ecosystems Thematic Working Groups under Smart Africa. Her research dissemination extends to the podcast 'Image Rights by N Mashinini', a creative output that has reached listeners across 87 countries and 369 cities in its three seasons.



Chair: Data Science Education

Dr Pravesh Ranchod

School of Computer Science and Applied Mathematics, University of the Witwatersrand

Pravesh Ranchod is a computer scientist at the University of the Witwatersrand, where he coordinates the Postgraduate Diploma in Data Science, a programme central to building data science skills in South Africa. He is also a co-founder, with Professor Benjamin Rosman, of the RAIL Lab, one of Africa's leading AI and robotics research centres, and his teaching spans robotics, cybersecurity, ethics, and software development. Beyond academia, he is a cofounder of Lelapa AI, Pravichi, and Aruna AI, tackling challenges in natural language processing, health analytics, and energy optimisation. These engagements reflect his broader interest in connecting computer science education, applied machine learning, entrepreneurship, and African AI development. As chair of the ADSC 2026 Data Science Education panel, Dr Ranchod brings an important perspective on curriculum design, skills development, postgraduate training, inclusive learning pathways, student support, and the development of data science talent pipelines for Africa's research, industry, innovation, and public-sector needs. His role will help frame the discussion around how African institutions can teach data science in ways that are rigorous, inclusive, practical, and responsive to the continent's evolving digital future.



Chair: Advances in Data Science

Prof Daniel Nicolas Wilke

School of Mechanical, Industrial and Aeronautical Engineering, University of the Witwatersrand

Prof Daniel Nicolas Wilke is a Full Professor and Head of the School of Mechanical, Industrial and Aeronautical Engineering at the University of the Witwatersrand, Johannesburg. His research advances gradient-only optimisation for discontinuous loss functions, multi-fidelity surrogate modelling, interpretable latent variable methods, engineering analysis, and data-driven approaches to complex systems. He enjoys getting to the heart of complex ideas and understanding the underlying principles that drive them, often through an optimisation lens: identifying key drivers, understanding trade-offs, and finding clearer paths forward. His work has evolved from developing practical industrial solutions in computational engineering, optimisation, and data science to applying similar ways of thinking to learning, student development, and mental health. Prof Wilke is the founder of the Emerging Engineering Technologies Laboratory at the University of Pretoria, an initiative established to promote computational, optimisation-based, and data-driven innovation in engineering. His work brings together advanced mathematical modelling, computational mechanics, machine learning, surrogate modelling, and interpretable methods for extracting causal and scientific insight from complex engineering systems. He is the author of *The Lost Art of Learning*, co-author of *Practical Mathematical Optimization*, and Associate Editor of *Computer Modeling in Engineering & Sciences*. He has held several leadership roles in the engineering and applied mechanics community, including serving as President of the South African Association for Theoretical and Applied Mechanics and as National Chair for the International Union of Theoretical and Applied Mechanics. He currently serves as an Advisory Board Member to the President of the South African Institution of Mechanical Engineering. As chair of the ADSC 2026 panel on *Advances in Data Science*, Prof Wilke brings a strong methodological and computational perspective to emerging developments in optimisation, machine learning, generative modelling, scientific computation, interpretable data-driven methods, and the broader role of advanced

data science in engineering, science, education, and innovation.



Chair: AI for Business Transformation - *From Experimentation to Scaled Impact*

Prof Rennie Naidoo

School of Business Sciences, University of the Witwatersrand

Rennie Naidoo is currently a Professor in Information Systems (IS) and Research Director at the Wits School of Business Sciences. He earned a Master's in Information Systems (with Distinction) from the University of the Witwatersrand and a PhD in Information Technology from the University of Pretoria. He is recognised as an AIS Distinguished Member for serving in association leadership roles and advancing IS research through AIS and AIS-affiliated journals. An established NRF-rated researcher, he focuses on data science, sustainable IT, artificial intelligence, and cybersecurity. Rennie is a member of the Editorial Review Board of the Journal of Global Information Technology Management.As chair of the ADSC 2026 panel on *AI for Business Transformation*, Prof Naidoo brings deep expertise at the intersection of technology, business strategy, governance, risk, organisational change, and responsible AI adoption. His leadership will help frame AI transformation not only as a technical challenge but also as a strategic, institutional, and managerial imperative.

34. PANELLIST BIOGRAPHIES

African Data Science Conference 2026

African Data Science, for Africa

This section presents biographical profiles of confirmed panellists contributing to ADSC 2026 panel sessions. The profiles cover panellists participating in *AI for Business Transformation: From Experimentation to Scaled Impact*, *Governing African Data Science: Accountability, Sovereignty, and the Architecture of Responsible AI*, *Data Science Education*, and *Emerging Advances in Data Science*. Together, these contributors bring perspectives from academia, banking, technology, consulting, public policy, research, industry, governance, and applied innovation, reflecting the conference's commitment to connecting African data science scholarship with practical, responsible, and scalable impact.



Panellist: AI for Business Transformation

From Experimentation to Scaled Impact

Prof Rutendo Hwindingwi

Wits Business School, University of the Witwatersrand

Prof (Adjunct) Rutendo Hwindingwi is the founder and CEO of Tribe Africa Advisory (TAA), a boutique advisory firm that works with multinational companies, organisations, and governments in growing their pan-African strategies. He has previously served as an executive at Deloitte, Sage Plc and the YNV Group. Dr Hwindingwi has led business development teams in Africa, Australia, the Middle East and Australasia. He is also a non-executive Director for the British Chamber of Commerce for SA and Vice Chairman of the Trade and Investment Forum for the American Chamber of Commerce SA. Dr Hwindingwi obtained his PhD from WBS in International Business Strategy, with a focus on developing markets.



Panellist: AI for Business Transformation

From Experimentation to Scaled Impact

Prof Josef Langerman

4IR Professor, University of Johannesburg

Prof Langerman's focus is on IT Management, Agility, DevOps and general topics in Software Engineering. He has many years of experience as an executive in large organisations where he filled positions like CIO, CTO, Head of Enterprise Architecture, Head of Strategy, Head of Software Development, etc. He supervises Master's and Doctoral students and is also lecturing at a postgraduate level. Key to his research is building deep relationships with industry and using research to improve organisations and the societies in which they operate.



Panellist: AI for Business Transformation
From Experimentation to Scaled Impact
Nkae Mocumi
Executive: Technology Strategy and Performance at Absa Bank Limited, Retail

Nkae Mocumi is an accomplished business transformation executive with over 20 years of experience driving enterprise-wide digital transformation across financial services, telecommunications, and mining. She currently serves as Executive: Technology Strategy and Performance at Absa Bank Limited in the retail division. Nkae has a strong track record of leveraging digital technologies to unlock efficiency, enhance customer experience, and enable scalable, future-ready operations. Prior to Absa, she held senior transformation roles at MTN Group and Anglo American. She holds an MBA from the Gordon Institute of Business Science and a Master's degree in Information Systems from the University of the Witwatersrand.



Panellist: AI for Business Transformation
From Experimentation to Scaled Impact
Asif Valley
National Technology Officer, Microsoft South Africa

Asif Valley, National Technology Officer at Microsoft South Africa since 2016, drives digital transformation with government, industry, and academia. With 30+ years in tech leadership at Oracle and IBM, he shapes discussions on cloud, AI, and digital skills, focusing on technology's societal impact. Since joining Microsoft in 2016, Asif has been instrumental in shaping the national conversation around cloud adoption, artificial intelligence, and digital skills development. Asif is a passionate advocate for using technology to empower people and organisations to achieve more.



Panellist: Governing African Data Science
Accountability, Sovereignty, and the Architecture of Responsible AI
Meshack Shabalala
Senior Manager for Data Science Massmart, a member of the Walmart Group

Meshack Shabalala is a Senior Manager for Data Science and AI at Massmart, part of the Walmart Group, where he leads the design and deployment of AI and analytics solutions across retail and supply-chain operations. His work focuses on translating advanced models into production systems that drive pricing, promotions, and customer engagement at scale. He brings a practitioner's perspective to AI governance, with hands-on experience navigating the realities of deploying AI systems in complex, high-volume environments. His work highlights where governance frameworks succeed, where they break down, and what it takes to make responsible AI practical in both African and global contexts. With a background in engineering and ongoing advanced studies in General Management at GIBS, and a Master's in Engineering Management from the University of Pretoria, Meshack combines technical depth with operational leadership. He advocates for a strategy-first approach to AI, where governance, accountability, and value creation are embedded into how systems are designed and deployed.



Panellist: Governing African Data Science

Accountability, Sovereignty, and the Architecture of Responsible AI

Prof Geci Karuri-Sebina

University of the Witwatersrand's Southern Centre for Inequality Studies

Prof Geci Karuri-Sebina is an Associate Professor at the University of the Witwatersrand's Southern Centre for Inequality Studies. By day (and sometimes night), she is a scholar-practitioner working at the intersection of people, place, time, and technological change, currently with a strong focus on digital governance and the sociotechnical implications of AI in the Global South. Geci is the ICESCO Chair on Innovation and Futures in Africa, the Founding Director of the Tayarisha Digital Governance Research Group, and Organiser of the Civic Tech Innovation Network. She is also a Fellow of the MIND Institute. Geci holds Bachelor's degrees in Computer Science and Sociology (Iowa); Master's degrees in Architecture and Urban Planning (UCLA); and a PhD in Planning and Innovation Studies (Wits University). A Desmond Tutu African Leadership Fellow, she holds editorial roles in several leading journals in the fields of futures, technology, and innovation studies.



Panellist: Governing African Data Science

Accountability, Sovereignty, and the Architecture of Responsible AI

Prof Chux Daniels

University of Pretoria, South Africa

Professor Chux Daniels is a leading scholar and practitioner in the fields of innovation, industrial policy, and technology management. He serves as Professor in the Department of Engineering and Technology Management at the Graduate School of Technology Management (GSTM), University of Pretoria, South Africa. He is also a Senior Research Fellow at the Science Policy Research Unit (SPRU), University of Sussex, UK. Professor Daniels holds directorial roles as the Director of the Transformative Innovation Africa Hub (TIAH) at the University of Pretoria and as the Director for Africa at UNIDO's Industrial Policy Lab (IPL). He is a Visiting Professor at the University of KwaZulu-Natal (UKZN) and an Adjunct Professor at the University of Venda, South Africa. Additionally, he is a Senior Fellow at the African Centre for Economic Transformation (ACET) in Ghana. His work focuses on transformative innovation, industrial development, and science, technology, and innovation (STI) policy across Africa and globally.



Panellist: Governing African Data Science

Accountability, Sovereignty, and the Architecture of Responsible AI

Prof Bhekinkosi Moyo

Centre on African Philanthropy and Social Investment, Discipline Lead of Philanthropy

Bhekinkosi is the Director of the Centre on African Philanthropy and Social Investment, Discipline Lead of Philanthropy, and an Adjunct Professor at the University of Witwatersrand's Wits Business School. He is a leading writer on issues of African philanthropy, a prolific author, researcher and

thought leader with a keen interest in questions of African resources, democracy and governance. He has championed the African discourse on philanthropy, contributed to the growth of many African civil society formations and has taken part in most of the continental processes of development and governance. Prior to joining the Wits Business School, he was CEO of the Southern Africa Trust, as well as being instrumental in establishing several institutions across Africa. He worked as Director of Programmes at Trust Africa and was also part of the formation of the African Union Foundation, becoming one of the founding council members. He sits on the boards of the International Society for Third Sector Research, the African Union Foundation, and chairs the SIVIO Institute and Association for Research on Civil Society in Africa boards. Equally, he has gained considerable experience in management, leadership and strategic roles over a significant period. Bheki has over 20 years of experience in knowledge generation, research and policy generation.



Panellist: Data Science Education

Professor Temesgen Zewotir

Pioneer and Director of the Data Science Unit for Business and Industry at the University of KwaZulu-Natal (UKZN)

Professor Temesgen Zewotir is a Full Professor and the Pioneer and Director of the Data Science Unit for Business and Industry at the University of KwaZulu-Natal (UKZN). He serves as an International Advisory Board Member of the African Centre of Excellence in Data Science (ACE-DS) and holds Adjunct Professor roles at Addis Ababa University, Bahir Dar University, Haramaya University, and the University of Rwanda. His research bridges theoretical statistical modelling and innovative machine learning to develop data science solutions for complex African challenges in health, industry, and development. Professor Zewotir is an elected member of the International Statistical Institute (ISI), and served as an ISI Special Interest Group on Data Science Ad hoc Committee member.



Panellist: Data Science Education

Johann Myburgh

Head: Data Science Mastery Programme

Johann Myburgh holds a MSc in Business Mathematics and Informatics (BMI), specialising in Data Mining (cum laude, North-West University, 2004), Johann began his career in banking, concentrating on customer and marketing analytics. In 2013, Johann transitioned to academia at the Centre for BMI at North-West University, where he played a leading role in establishing and advancing the Business Analytics / Data Science postgraduate programme. After a decade in academia, Johann accepted a position at Standard Bank Group to lead the Data Science Mastery Programme, one of the group's two flagship training initiatives. In this role, he focuses on accelerating the skills development of Data Science practitioners, ensuring a healthy talent pipeline across Africa. Johann is passionate about developing innovative data-driven solutions and mentoring the next generation of data scientists.



Panellist: Data Science Education

Dr Peter Olukanmi

Senior Lecturer at the Department of Electrical and Electronics Engineering Technology, University of Johannesburg

Dr Peter Olukanmi is a Senior Lecturer at the Department of Electrical and Electronics Engineering Technology, University of Johannesburg, where he leads the Data Science and Computational Intelligence Research Cluster (D-CIRCLE). He obtained a PhD from the same institution. He has taught over 10 different modules at undergraduate and postgraduate levels to students in Data Science, Computer Science and Electrical & Electronics Engineering university programs; won international conference awards in the field of soft computing and machine intelligence; has been involved in supervising over 20 Data Science related PhD and Master's studies. He led the Data Science section of the BRICS Skills Challenge when South Africa hosted in 2023.



Panellist: Emerging Advances in Data Science

Dr Lebohang Mashatola

IBM Research Africa (South Africa Lab)

Dr Lebohang Mashatola is a Research Scientist working on quantum machine learning applications at the IBM Research Africa (South Africa lab). With a background rooted in cancer biology and bioinformatics, Lebohang's research focus has evolved towards using quantum computing with the aim of incorporating his domain knowledge into quantum research at IBM, facilitating its practical application in the healthcare sector.



Panellist: Emerging Advances in Data Science

Dr Mark Nasila

Chief Data and Analytics Officer at First National Bank Risk

Dr Mark Nasila is a luminary in artificial intelligence (AI) and data science and the Chief Data and Analytics Officer at First National Bank Risk. He also shares his expertise at the Singularity Group, specialising in AI, data science and data strategies. He is a leading member of the National Institute for Theoretical Physics and Computational Sciences (NITheCS), a research fellow at Stellenbosch University, and a Professor of Practice in Artificial Intelligence at the University of Johannesburg. Dr Nasila's innovative approach at FNB has revolutionised risk management and forensic due diligence through advanced AI systems, setting new benchmarks in banking technology. He is a renowned speaker, gracing stages at the likes of the Business-Tech Digital Banking Conference, Chief Data & Analytics Officer forums, and the SingularityU South Africa Summit, sharing his insights into the future of AI and big data. He is also board member of Moody's Analytics Europe and Africa advisory board, where he shares his insights with a broader audience and has established himself as an expert in his field. Dr Nasila is the author of the best-selling book – African Artificial Intelligence, and the

recently released book - Mastering Sovereign Artificial Intelligence. Dr. Nasila's work exemplifies the transformative power of emerging technology in finance and beyond, making him a distinguished figure in the global tech landscape. He was recognized as 2025 Africa's most influential person in AI and data by DataIQ and Accenture.



Panellist: Emerging Advances in Data Science

Dominique de Wet

Machine Learning Engineer at Hatch

Dominique de Wet is a Machine Learning Engineer at Hatch with a Bachelor's degree in Electrical Engineering and a Master's degree in Machine Learning and Artificial Intelligence. She began her career in control systems and industrial automation before transitioning into AI and digital engineering, where she works on applying advanced data analytics, optimisation, and artificial intelligence to solve complex industrial challenges. Beyond the technical aspects of AI, Dominique is passionate about its broader societal impact, including ethical AI development and responsible innovation. She is particularly interested in ensuring that the benefits of AI are shared widely and create positive, inclusive outcomes for communities across Africa and beyond.



Panellist: Emerging Advances in Data Science

Obakeng Moepya

Co-founder & COO of Isazi.ai

Obakeng holds a PhD in Electrical Engineering (Machine Learning) and multiple degrees in mathematics and finance from Wits. A former CSIR researcher and university lecturer, his work in fraud detection and optimisation has earned international recognition, including Best Student Publication at ACIIDS 2017 in Japan.



Panellist: Emerging Advances in Data Science

John Mukomberanwa

Head of Digital Insights, CIB

John Mukomberanwa is Head of Digital Insights at Standard Bank CIB, where he leads the AI and analytics agenda across Corporate and Investment Banking. His work centres on translating advanced AI, including generative and agentic systems, into commercial outcomes and scalable client solutions. John is the architect of SmartNudge, a multi-award-winning B2B recommender engine that has redefined client engagement through AI-driven insights at scale. Recognised for building high-impact teams and driving data-led transformation, he brings both scientific rigour and commercial acuity to the field. He serves on the governing body of the Standard Bank Lab at Stellenbosch University's School for Data Science and Computational Thinking, shaping the next generation of AI talent on the continent.



Panellist: Emerging Advances in Data Science

Stephanie Polkinghorne

Data Science Manager, CIB Digital Channels

Stephanie Polkinghorne is a data science leader driving AI innovation, digital product development, and advanced analytics across CIB at Standard Bank. She leads a cross-functional team building scalable AI systems that connect clients' business needs with real technical execution. She brings a practical perspective on building impactful AI solutions and enjoys working with teams to turn complex ideas into real-world value.

35. DATA SCIENCE HIRING AND EMPLOYABILITY

Skills, Careers, and the Future of Work

A special ADSC 2026 industry engagement session in partnership with the Wits Graduate Recruitment Programme

The **Data Science Hiring and Employability in Africa** session is one of the distinctive features of ADSC 2026. While many data science gatherings focus primarily on technical research, tutorials, and grassroots community-building, this session deliberately foregrounds **industry engagement, graduate employability, recruitment pathways, workplace readiness, and the future of data science work in Africa**. Hosted in partnership with the **Wits Graduate Recruitment Programme**, the session creates a direct bridge between data science education, graduate talent, employer expectations, industry needs, recruitment practices, and African digital transformation. It brings together students, graduates, employers, recruiters, HR professionals, data science practitioners, sponsors, universities, professional bodies, funders, and policymakers for a practical conversation about how Africa can prepare, identify, support, employ, and retain data science talent. The session reflects the broader ADSC 2026 theme, **African Data Science, for Africa**, by asking how African institutions, industries, and students can work together to build stronger data science talent pipelines, improve workplace readiness, and ensure that emerging African data scientists are visible, employable, globally competitive, and able to contribute meaningfully to research, business, policy, innovation, and society.

SPECIAL SESSION

Data Science Hiring and Employability in Africa

Session Details

Session title	**Data Science Hiring and Employability in Africa: Skills, Careers, and the Future of Work**
Date	Wednesday, 24 June 2026
Time	18:00–20:00
Optional networking	20:00–20:30
Venue	Wits Science Stadium, University of the Witwatersrand, Johannesburg. Final room allocation to be confirmed.
Hosted in partnership with	Wits Graduate Recruitment Programme, Wits University
Moderator	Dr Moses Phiri, NIQ Company

Session focus	Data science employability, graduate recruitment, workplace readiness, industry engagement, talent pipelines, AI-era careers, and the future of data science work in Africa.
RSVP	https://forms.cloud.microsoft/Pages/ResponsePage.aspx?id=jJAbS4JVd0O6B6NtZeNJNCpLg8bik0RAnPmfUuwPwwtUNVkzNzVDWDVOREQ0UDA5RDdTSFlFUTRKUi4u

SESSION RATIONALE

Why This Session Matters

Africa is producing a growing number of students and graduates in statistics, data science, artificial intelligence, computer science, analytics, engineering, economics, financial technology, and related fields. At the same time, employers across banking, insurance, healthcare, consulting, telecommunications, mining, retail, government, technology, and the public sector increasingly require data-literate professionals who can translate analytical methods into practical decisions. However, a persistent gap remains between academic training and workplace expectations. Employers often seek graduates who combine technical competence with communication skills, business understanding, ethical awareness, problem-solving ability, teamwork, domain knowledge, and the capacity to operate in complex organisational environments. Students, in turn, need clearer guidance on how to build credible portfolios, prepare for interviews, understand workplace expectations, and position themselves for meaningful and future-proof careers. This session responds directly to that gap. It is designed as an honest and practical conversation about data science hiring in Africa: what employers need, what universities can do better, how students can prepare, how industry can support talent development, and how African data science careers can be strengthened through collaboration between universities, employers, funders, recruiters, and professional networks.

PROGRAMME AGENDA

Wednesday, 24 June 2026

Session Programme

17:30–18:00	**Registration and Arrival Networking** Delegates arrive, register for the evening session, and engage informally with students, employers, sponsors, and conference participants.
18:00–18:10	**Opening and Welcome Remarks** Opening by the ADSC 2026 Conference Chair, **Dr Farai Mlambo**. The opening remarks will position the session within the broader ADSC 2026 vision of strengthening African data science through research, industry engagement, postgraduate development, and employability.

18:10–18:20	**Platinum Sponsor Address** **Joshua Knight**, Old Mutual. The sponsor address will reflect on industry needs, digital transformation, AI-enabled personalisation, data science capability-building, and the importance of preparing graduates for the changing world of work.
18:20–18:30	**Industry Insights Presentation** **Mabu Manaileng**, Standard Bank. This presentation will provide practical insight into data science, automation, AI adoption, and skills expectations in a major African financial services environment.
18:30–19:20	**Panel Discussion** *Data Science Employability in Africa: Bridging Skills, Industry and Opportunity*. Moderated by **Dr Moses Phiri**. The panel will bring together employer, recruiter, technology, banking, insurance, research, and data science perspectives.
19:20–19:40	**Audience Question and Answer Session** Delegates, students, graduates, sponsors, employers, and academic participants will have the opportunity to ask questions. Roving microphone support will be provided where possible.
19:40–19:50	**Closing Reflections and Vote of Thanks** Closing reflections by **Dr Moses Phiri**, highlighting key takeaways for students, universities, employers, sponsors, and the wider African data science community.
19:50–20:00	**Closing Announcements and Transition** Final announcements, information on conference activities, and transition to informal networking.
20:00–20:30	**Optional Networking** Informal networking among students, graduates, employers, sponsors, panellists, academics, and conference delegates.

PANEL DISCUSSION

Bridging Skills, Industry and Opportunity

Panel Overview

Panel title	**Data Science Employability in Africa: Bridging Skills, Industry and Opportunity**
Moderator	**Dr Moses Phiri**, NIQ Company
Purpose	To explore how African universities, employers, recruiters, sponsors, public-sector institutions, and professional communities can work together to strengthen data science employability, workplace readiness, and talent pipelines.

Panel format	Brief moderator framing, concise panellist introductions, structured moderated discussion, audience Q&A, and closing reflections.
Audience	Students, graduates, postgraduate researchers, early-career professionals, employers, recruiters, HR managers, data science practitioners, academic programme leaders, professional bodies, sponsors, funders, and policymakers.

Confirmed Moderator and Panellists

Dr Moses Phiri	Moderator. NielsenIQ. Dr Phiri is a seasoned data scientist, statistician, and researcher with more than 15 years of experience across academia, industry, and applied research. He is a senior leader in data science at NIQ, working at the intersection of statistical methodology, machine learning, and big data integration.
Jeremy Beukes	Programme Manager, QuantifyYourFuture. Jeremy Beukes has close to 30 years of talent-management experience, with a particular focus on young talent across telecommunications, consulting, professional services, and insurance. He supports QuantifyYourFuture, powered by SAGEA, in promoting quantitative, computational, and data science career pathways.
Joanna Preston	Head of Young Talent, FNB. Joanna leads the FNB Young Talent Practice, including graduate and youth employability programmes, assessments, employment branding, and graduate talent management. She is also Chairperson of the South African Graduate Employers Association.
Joshua Knight	Old Mutual. Executive in Analytics, Data, AI, Digital Transformation, and Customer Centricity. Joshua is a strategic leader with experience in developing and operationalising data-driven products across financial services, retail, consumer goods, and technology, with a strong focus on AI-enabled business transformation and hyper-personalisation.
Mabu Manaileng	Head of AI Engineering, Standard Bank Group. Mabu leads the development and deployment of large-scale AI systems within Personal and Private Banking. He is also Co-founder and Research Scientist at Datawizzards, with research and practice interests spanning applied AI, deep learning, AI engineering, LLMs, intelligent automation, and African language technologies.
Dr Sibusisiwe Makhanya	Senior Research Manager and South Africa Lab Leader, IBM Research Africa. Dr Makhanya leads teams contributing to fundamental and applied AI and quantum computing. Her research interests include spatial statistics, data science, climate risk and vulnerability analysis, environmental modelling, and health modelling.

Lumengo Mngomezulu	Data Scientist, Discovery. Lumengo applies advanced analytics and machine learning to support data-driven innovation in the healthcare and insurance sector. She holds an MSc in Business Analytics from Imperial College London and has experience across consultancy, international development, public policy, and innovation.
Ikageng Mokwena	Senior Advisor in Energy Trading, Eskom. Ikageng leads the design and development of big-data and AI-driven solutions to support energy trading operations. His work spans power systems, advanced analytics, automated data pipelines, and modelling tools such as Python, PLEXOS, and PyPSA.

This panel forms part of the Data Science Hiring and Employability Evening under the theme: *Data Science Employability in Africa: Bridging Skills, Industry and Opportunity*.

GUIDING QUESTIONS

Issues for Discussion

Panel Questions

1	**What skills are employers actually looking for in data science, statistics, analytics, and AI graduates?** This question will surface expectations around technical competence, coding, statistics, communication, business understanding, problem-solving, ethics, teamwork, and domain knowledge.
2	**Where is the biggest gap between university training and workplace expectations?** This will help identify curriculum gaps, internship needs, workplace-readiness challenges, and opportunities for stronger university-industry collaboration.
3	**What does workplace readiness mean in the age of artificial intelligence?** This question will explore adaptability, responsible AI use, prompt literacy, automation awareness, critical thinking, data governance, and the ability to work with AI-enabled tools.
4	**How can students make themselves more visible and competitive in the data science job market?** This will invite discussion on portfolios, GitHub, LinkedIn, internships, certifications, applied projects, networking, communication, and evidence of real-world problem-solving.
5	**How can industry contribute more meaningfully to data science education and talent development?** This question will explore guest lectures, internships, mentoring, case studies, scholarships, hackathons, graduate programmes, curriculum input, sponsorship, and applied research collaboration.

6	**How do we build stronger African data science talent pipelines?** This will open discussion on inclusion, funding, early exposure, mentorship, postgraduate development, regional networks, industry partnerships, and retaining African talent.
7	**What should universities stop doing, start doing, or do differently to prepare graduates for the future of work?** This question is intended to generate practical, honest, and constructive recommendations for curriculum design, student support, applied learning, and employability preparation.
8	**What is one piece of advice each panellist would give to a student who wants to build a meaningful data science career in Africa?** This closing question will provide delegates with clear, actionable takeaways from the panel.

DELEGATE VALUE

What Participants Can Expect

Delegates attending this session can expect a practical and career-focused discussion that connects academic preparation with real workplace expectations. Students and graduates will gain insight into how employers think about data science hiring, what makes candidates stand out, and how to develop evidence of readiness beyond formal qualifications. Employers, recruiters, sponsors, and partners will have the opportunity to engage directly with emerging talent, understand the academic pipeline, strengthen visibility among students and graduates, and contribute to shaping the future of African data science careers. Universities and academic programme leaders will gain useful feedback on curriculum relevance, applied learning, industry expectations, and the kinds of partnerships needed to prepare graduates for the future of work. The session is intended to move beyond general discussion toward practical alignment between **skills, opportunity, training, recruitment, workplace readiness, and African data science impact**.

OPERATIONAL NOTES

Session Delivery and Support

Implementation Notes

Opening	The session will be opened by **Dr Farai Mlambo**, ADSC 2026 Conference Chair. The opening will acknowledge Wits Graduate Recruitment Programme, sponsors, panellists, students, and delegates.
Moderation	**Dr Moses Phiri** will moderate the panel discussion, manage time, guide the flow of questions, bring panellists into the conversation, and support the audience Q&A.

Prepared questions	Panel questions will be prepared in advance and may be shared with panellists before the session to support a focused, polished, and useful discussion.
Q&A support	Given expected student and delegate interest, the organising team should provide roving microphones and support staff to assist with audience questions.
Closing	**Dr Moses Phiri** will provide closing reflections and a vote of thanks.
Panellist information	All panellists should provide their full title, institutional affiliation, short biography, preferred name and title, and profile photo for inclusion in the final programme.
Networking	The final 30 minutes may be used for informal networking among students, graduates, employers, sponsors, panellists, and conference delegates.

PARTICIPATION LINKS

RSVP and Conference Information

Useful Links

RSVP for this session	https://forms.cloud.microsoft/Pages/ResponsePage.aspx?id=jJAbS4JVd0O6B6NtZeNJNCpLg8bik0RAnPmfUuwPwwtUNVkzNzVDWDVOREQ0UDA5RDdTSFlFUTRKUi4u
Conference website	https://www.wits.ac.za/adsc2026/
Conference platform	https://africandatascienceconference.com/
LinkedIn	https://www.linkedin.com/company/african-data-science-conference/

36. PLENARY INVITED PAPERS

African Data Science Conference 2026

Invited contributions at the intersection of methodology, application, and African impact

The ADSC 2026 Plenary Invited Papers provide a dedicated platform for selected contributions of broad scientific, methodological, and applied significance. These papers are positioned within the plenary programme because they speak to major questions at the heart of the conference theme, **African Data Science, for Africa**. The invited papers are intended to stimulate interdisciplinary conversation across statistics, machine learning, artificial intelligence, visualisation, mining, climate science, sustainability, industrial analytics, and African development contexts. They bring together methodological innovation and practical relevance, demonstrating how data science can help address complex problems in sectors that are central to Africa's future. Three plenary invited papers will be featured in ADSC 2026. The first focuses on animated biplot visualisation for African climate-pattern analysis and is scheduled as an early Friday plenary invited paper. The second will address machine learning in mining. The third invited paper will be confirmed in the final programme. Full details, speaker affiliations, session timing, and final titles will be updated through the ADSC 2026 Delegate Portal and official conference communication.

PLENARY INVITED PAPERS

Featured Scientific Contributions

Plenary Invited Paper 1

Animated Biplot Visualisations of African Climate Patterns

Authors: Raeesa Ganey and Johané Nienkemper-Swanepoel
Affiliation(s): University of the Witwatersrand and Stellenbosch University
Scientific theme: Theme 3: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Keywords: Animated biplots; multivariate visualisation; African climate data; principal component analysis; `moveEZ`; `biplotEZ`; ERA5; climate patterns; dynamic visualisation; R package
Presentation: Plenary Session

Abstract

Multivariate data sets are central to data science across Africa, with applications ranging from climate monitoring and agricultural research to public health surveillance and socioeconomic analysis. However, visualising how the structure of such data evolves in response to a changing factor remains a persistent challenge. Static visualisations can capture relationships among variables and observations at a single point in time, but they are limited in their ability to show how these relationships shift as conditions change. This plenary invited paper presents a methodology for dynamic biplot visualisation implemented in the `moveEZ` R package and demonstrates its utility through an application to African climate data. Biplot visualisation is a powerful multivariate technique that simultaneously represents observations and variables in a reduced-dimensional space. Through principal component analysis, high-dimensional data are projected onto a lower-dimensional plane in which observations appear as

points and variables appear as axes. This allows data scientists to identify clusters, detect associations among variables, and assess how individual observations relate to measured conditions within a single interpretable display. For data recorded across multiple levels of a changing factor, however, a single static biplot is insufficient to capture the full structure of change. The `moveEZ` package extends the biplot methodology of the `biplotEZ` package by introducing animation to visualise sequential changes in multivariate structure. Instead of producing disconnected static biplots, `moveEZ` generates smooth animated transitions that show how observation coordinates and axis orientations shift from one factor level to the next. This transforms the biplot into a temporal narrative, enabling viewers to perceive trajectories, recognise evolving patterns, and interpret multivariate change more intuitively. Although time is the typical driver of animation, the framework can accommodate any ordered factor, including treatment levels or experimental conditions. The methodology is demonstrated using ERA5 climate data from the European Centre for Medium-Range Weather Forecasts, a publicly available reanalysis data set covering atmospheric variables across several decades and IPCC-designated reference regions, including regions across Africa. Animating biplots over successive years reveals how associations among climate variables evolve, how regional climate profiles shift in multivariate space, and how the trajectory and magnitude of change differ across regions. These insights are directly relevant to African climate adaptation and resilience research. Patterns that may be overlooked in static displays become more apparent in continuous animated sequences, illustrating the practical value of dynamic visualisation tools for data scientists working with complex, evolving African data.

Plenary Invited Paper 2

AI-Enabled Simultaneous Optimisation of Geological and Mineral Resource Models for Smarter Mining Operations

Authors: Glen T. Nwaila
Affiliation(s): African Research Centre for Ore Systems Science (CORES), School of Geosciences, University of the Witwatersrand
Scientific theme: Theme 4: Data Science, Artificial Intelligence, Industry, and Digital Transformation
Keywords: Artificial intelligence; variational Gaussian processes; mineral resource modelling; geological modelling; polymetallic deposits; uncertainty quantification; smarter mining; orebody intelligence; spatial uncertainty; geometallurgy
Presentation: Plenary session

Abstract

Mining operations increasingly depend on mineral resource models that must be updated, interrogated and converted into decisions under conditions of spatial uncertainty, sparse data, changing support and operational time pressure. Traditional workflows often treat geological modelling, mineral resource estimation and grade control as sequential tasks. This separation can limit the ability of mining teams to propagate uncertainty, update models as new information becomes available and optimise decisions across the full mining value chain. This plenary invited paper argues that mineral resource models are no longer passive technical products created at fixed points in the value chain. In smarter mining operations, they are becoming adaptive decision systems that integrate geology, grade, uncertainty, geometallurgy and operational constraints in near-real time. Artificial intelligence provides a pathway for connecting traditionally separate modelling stages and supporting the simultaneous optimisation of geological and mineral resource models in complex ore systems. The scientific focus of the paper is on variational Gaussian processes as a scalable probabilistic framework for modelling spatially distributed geological and mineral resource variables. These models are especially relevant to polymetallic deposits, where drill hole spacing is uneven, geological boundaries are uncertain, grade distributions are heterogeneous and multiple correlated commodities must be

evaluated together. Rather than treating lithology, mineralisation domains, grade estimation and uncertainty assessment as isolated steps, variational Gaussian processes allow these components to be represented as connected probabilistic surfaces that can be updated as new geological, geochemical, geometallurgical and production data become available. Case studies from polymetallic deposits demonstrate how AI-enabled modelling can identify areas where geological boundaries are uncertain, quantify where additional drilling is likely to add the greatest value, evaluate how grade, tonnes and metal content change under alternative spatial supports, compare uncertainty between commodities and link resource confidence more directly to mine planning, blending, processing and value optimisation. This is particularly important in polymetallic systems because economic value is rarely controlled by one variable alone. Copper, zinc and lead may each respond differently to geological controls, mineral assemblages, processing behaviour and market assumptions. The broader contribution is a movement beyond sequential estimation workflows towards integrated, uncertainty-aware and operationally connected orebody intelligence. Variational Gaussian processes offer one pathway for achieving this transition because they combine spatial prediction, uncertainty quantification, data fusion and model updating within a single probabilistic framework. The result is a dynamic view of the orebody that supports better decisions, strengthens confidence in resource models and helps mining operations extract greater value from geologically complex polymetallic deposits.

Plenary Invited Paper 3

Evaluating Multimodal Large Language Model Diagnostic Performance at a Tertiary South African Hospital

Authors: Bruce A. Bassett, Amy Rouillard, Sitwala Mundia, Michael Cameron Gramaniee, Linda Camara, Ziyaad Dangor, Shabir A. Madhi, Kajal Morar, Marlvin T. Ncube, Ismail Kalla, and Haroon Saloojee

Affiliation(s): University of the Witwatersrand; Wits MIND Institute; Grai Labs; South African Medical Research Council Vaccines and Infectious Diseases Analytics Research Unit; Charlotte Maxeke Johannesburg Academic Hospital

Scientific theme: Theme 3: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics

Keywords: Disease diagnosis; healthcare; large language models; artificial intelligence; multimodal AI; internal medicine; paediatrics; hospitals; clinical decision support; patient safety

Presentation: Plenary session

Abstract

Large language models are increasingly being proposed as clinical decision-support systems, yet real-world multimodal inpatient-based benchmarks remain limited, particularly in low- and middle-income country public hospital settings. This plenary invited paper presents the Validation of LLMs versus Doctors in Diagnosis study, a retrospective evaluation of ten frontier large language models' diagnostic performance across 539 multimodal inpatient cases at a tertiary public hospital in Johannesburg, South Africa. The study is especially relevant to African healthcare systems because it evaluates diagnostic performance using locally grounded clinical data rather than relying only on benchmarks developed in high-income settings. Multimodal inputs included radiology data from CT, MRI, X-ray and ultrasound imaging, while laboratory results, clinical narratives and vital signs were supplied as structured text. To assess model outputs at scale, the study used a calibrated LLM Jury comprising three independent frontier large language models aligned to expert clinician ratings. The evaluation considered diagnostic accuracy, differential diagnosis quality, clinical reasoning and patient safety. Three quantitative findings are central to the contribution of the paper. First, mean performance was tightly clustered across all ten models despite an approximately 50-fold range in cost per case. GPT-5

Mini scored within 5% of the top-performing model at roughly US$0.02 per case, suggesting that model selection in resource-constrained settings should weigh affordability, reliability, input limits and governance considerations alongside headline accuracy. Second, every model exceeded recorded ward diagnoses on comparable scores, with a $> 99.9\%$ bootstrap probability, indicating that model outputs aligned more closely with expert clinician reference standards than routine documentation. Third, deployment readiness cannot be inferred from average accuracy alone. All models raised some safety concerns, and responses to the data presented ranged from approximately $\sim 65\%$ to 100%, largely reflecting vendor-specific multimodal input limits. The findings support the view that multimodal large language models may serve as supervised diagnostic-support tools in African public hospitals, but only when they are evaluated on local data and implemented with careful attention to documentation quality, affordability, input constraints, safety-tail risk, governance and clinician oversight.

Plenary Invited Paper 4

The survivor's guide to being human in the AI revolution

Authors: Dario Fanucchi
Affiliation(s): Isazi ai
Scientific theme: Theme: Special Invited Industry Data Science Case Studies
Keywords: AI, applied AI systems, forecasting, education, document automation, and agentic optimisation.
Presentation: Plenary session

Abstract

I built Isazi on the belief that real-world problems can be transformed by applying mathematics, deep technical skill, and original thinking. We have always been both builders and heavy users of AI, but the last six months have been disruptive even for us. If an AI model can inspect the data, what is the value of a data scientist? If an LLM can write thousands of lines of code, what is the value of an AI engineer? I have watched technology leaders around me respond by downsizing engineering teams, lowering the technical bar, or treating expertise as less important than model access. I think they are wrong. In this talk, I will argue that deep expertise matters now more than ever. AI has changed the nature of technical work, but it has not removed the need for judgement, taste, problem selection, mathematical thinking, domain understanding, evaluation, and system design. If anything, powerful models make these human capabilities more valuable, because they determine whether AI is pointed at problems that matter and whether its outputs can be trusted. I will share Isazi's journey building applied AI systems, including examples from forecasting, education, document automation, and agentic optimisation. I will also unpack my view of human-centric data science in a world of increasingly capable AI models, and what it means to build a real, lasting career if you are starting out in 2026.

37. PAPER ABSTRACTS

African Data Science Conference 2026

Scientific contributions presented across the ADSC 2026 themes

Paper Abstract presentation times are subject to change as more presenters register for the conference.

This section presents abstracts of papers to be delivered at ADSC 2026. Each contribution is organised in a consistent conference format, including the paper identification number, title, authorship, institutional affiliation, scientific theme, keywords, and abstract text. This structure is intended to make the scientific programme easy to navigate while preserving the scholarly identity of each contribution. The abstracts reflect the breadth and ambition of the conference theme, **African Data Science, for Africa**. They showcase research that engages with both methodological advancement and practical application, spanning statistical methodology, spatial data science, machine learning, public health surveillance, geospatial modelling, low-resource learning, urban informality, digital infrastructure, business analytics, research data management, and development-oriented data science. Together, these papers demonstrate the diversity of data science work being undertaken across universities, research institutions, public-sector organisations, industry-facing environments, and interdisciplinary communities. They also highlight the importance of context-aware methods, African datasets, local knowledge systems, computational innovation, and evidence-based decision-making in addressing complex social, economic, health, environmental, and institutional challenges. The abstracts are presented as part of a working scientific programme. Paper allocations, session groupings, presentation formats, and scheduling details may be refined as the final conference programme is completed.

PAPER ABSTRACTS

Scientific Programme Contributions

Invited Poster Abstract

Application of Artificial Intelligence and Machine Learning to optimise hydrogen production in Underground Coal Gasification

Authors: Tiny Ngobeni
Affiliation(s): University of the Witwatersrand
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics (Track 2, WSS 2)
Keywords: Artificial Intelligence, decarbonisation, hydrogen, Ridge Regression (RR), Support Vector Regression (SVR), Random Forest Regression (RFR), Coal Gasification, optimization
Presentation:

Abstract
With increasing global efforts toward decarbonisation, hydrogen has emerged as a key component

of future clean energy systems. However, for highly coal-dependent countries such as South Africa, the transition to cleaner energy alternatives remains economically and technically challenging. Underground Coal Gasification (UCG) presents a promising solution by enabling the in-situ conversion of otherwise inaccessible coal seams into syngas, primarily composed of carbon monoxide (CO), methane (CH), and hydrogen (H). Furthermore, when integrated with Carbon Capture, Utilisation, and Storage (CCUS) technologies, UCG offers the potential for significantly reduced greenhouse gas emissions while supporting cleaner hydrogen largely rely on conventional techniques that often fail to capture these dynamic process behaviours effectively, necessitating the integration of machine learning methods. However, the UCG process remains difficult to monitor and control because it involves complex underground reactions that are nonlinear, time-varying, and uncertain in largely rely on conventional techniques that often fail to capture these dynamic process behaviours effectively, necessitating the integration of machine learning methods e. Existing monitoring and control approaches rely largely on conventional techniques that are often unable to effectively capture these dynamic process behaviours, thereby necessitating the integration of machine learning approaches. Although machine learning has been applied in some areas of UCG research, limited studies have focused specifically on hydrogen optimisation under South African coal seam conditions. This study, therefore, aims to develop and evaluate machine learning-based models for predicting and optimising hydrogen concentration in UCG, with a particular focus on maximising hydrogen yield in the produced syngas. The dataset is compiled from published peer-reviewed UCG experimental studies together with laboratory-scale experimental data obtained through collaboration with a research group conducting parallel UCG studies under South African coal conditions. Three supervised regression algorithms, namely Ridge Regression (RR), Support Vector Regression (SVR), and Random Forest Regression (RFR), is developed and compared using the MATLAB Machine Learning and Statistics Toolbox. These models capture the relationships between key UCG operating parameters, including gasification temperature, pressure, oxidant type, steam-to-oxygen ratio, coal properties, and hydrogen concentration as the output variable. Model performance is evaluated using R^2, RMSE, and MAE, with 5-fold cross-validation applied across an 80/20 training-test split. The best-performing model is proposed as a replicable machine learning framework for syngas hydrogen optimisation, supporting cleaner electricity generation and contributing toward South Africa's Just Energy Transition and broader decarbonisation goals.

Invited Oral Presentation Abstract

Artificial Intelligence-Based Modelling Approaches for Optimizing Hydrogen Production in Underground Coal Gasification

Authors: Ncedo Sandile Maseko
Affiliation(s): University of the Witwatersrand
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics (Track 2, WSS 2)
Keywords: Artificial Intelligence, Optimization, Coal Gasification, Hydrogen Production
Presentation:

Abstract

Underground Coal Gasification (UCG) has been investigated for several decades as a method for converting deep or otherwise unmineable coal seams into syngas through thermochemical reactions. Hydrogen-rich syngas generated from UCG offers significant potential to support cleaner energy systems and emerging hydrogen economies, particularly in coal-dependent regions undergoing energy transition. Experimental and pilot-scale studies have demonstrated that hydrogen concentration in syngas is strongly influenced by operating temperature, pressure, steam-to-oxygen ratio, injection rate, and intrinsic coal properties. Conventional thermodynamic and kinetic models have provided

valuable understanding of reaction pathways, including steam reforming and water–gas shift reactions. However, these mechanistic approaches often struggle to represent the nonlinear, heterogeneous, and time-varying nature of underground gasification processes. Geological variability coupled multiphase heat and mass transfer, and evolving cavity geometry further limit the predictive accuracy of traditional models. While machine learning techniques have been successfully applied in surface gasification systems and broader hydrogen production technologies, their systematic application to hydrogen-focused optimisation in UCG remains underdeveloped. This study addresses that limitation by developing and comparing multiple artificial intelligence-based modelling approaches aimed specifically at improving hydrogen prediction under dynamic underground conditions. The research evaluates a range of supervised machine learning algorithms for predicting hydrogen concentration in UCG-produced syngas. Key operational variables including temperature, pressure, steam-to-oxygen ratio, injection rate, moisture content, ash composition, and coal characteristics are selected based on their established influence on hydrogen formation reactions. The modelling approaches implemented include Multiple Linear Regression, Support Vector Regression, Artificial Neural Networks, Decision Tree Regression, Random Forest Regression, and Gaussian Process Regression. Model performance is assessed using validation metrics such as Root Mean Square Error, Mean Absolute Error, and residual analysis to determine predictive robustness across varying operating conditions. Emphasis is placed on nonlinear and probabilistic models capable of capturing complex parameter interactions and representing uncertainty within subsurface systems. Comparative results indicate that nonlinear machine learning models outperform conventional linear regression techniques in predicting hydrogen concentration. Among the evaluated approaches, Gaussian Process Regression demonstrates superior predictive capability, achieving validation RMSE values of approximately 10.2. The model effectively captures nonlinear interactions between temperature and steam-to-oxygen ratio, which are shown to be dominant drivers of hydrogen yield. Furthermore, the probabilistic structure of Gaussian Process Regression provides confidence intervals, enabling quantification of predictive uncertainty under varying underground conditions. Feature importance analysis consistently highlights temperature and oxidant ratios as the most influential parameters controlling hydrogen formation. The findings demonstrate that artificial intelligence-based modelling offers a powerful alternative to purely mechanistic approaches for hydrogen-focused optimisation in UCG systems. By capturing nonlinear dynamics and parameter interactions that traditional models cannot adequately represent, AI-driven frameworks provide improved predictive accuracy and enhanced decision support. Future research will focus on expanding datasets, incorporating hybrid mechanistic–machine learning models for improved interpretability, and extending comparative modelling to multi-objective optimisation frameworks aimed at maximising hydrogen yield while maintaining process stability.

Submission 63

Spatial Approximate Bayesian Bootstrap Imputation: Balancing Accuracy and Computation

Authors: Miguel Torres and Adam Sykulski
Affiliation(s): University of the Witwatersrand, South Africa; Imperial College London, United Kingdom
Scientific theme: Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations (Track 1, WSS 1)
Keywords: Spatial statistics; missing data; computational efficiency; multiple imputation; kriging
Presentation: Session 1.1; Wednesday 24 June; 09:45–10:05; Track 1; Venue: WSS 1

Abstract

Missing data is a prevalent issue for modelling geostatistical data, but there is no balanced imputation method. The methods used to address missing data in geostatistics are either fast but imprecise,

or complex and precise but computationally expensive. A balanced method is therefore needed to fill the gap between these approaches. This paper proposes a novel Spatial Approximate Bayesian Bootstrap (SABB) within the multiple imputation framework. The method adapts the Approximate Bayesian Bootstrap using a parametric spatial bootstrap and adjusted weights. SABB is compared with complete case analysis, predictive mean matching, and kriging with multiple imputation. Machine learning approaches using Gaussian processes were also considered, but were either too slow or presented implementation difficulties. The methods were compared in line with the literature, considering both accuracy and computational performance, including computation time and memory usage. The SABB method was found to be competitive in accuracy while achieving faster computation than more advanced methods. The method was further illustrated using the Meuse river dataset, where it improved upon complete case analysis. Prediction errors were smoother and smaller under the SABB method.

Submission 217

Marikovia: Data-Efficient Physics-Informed Learning for Informal Economy Health in Gauteng

Authors: Owethu Mlambo
Affiliation(s): Eduvos, South Africa
Scientific theme: Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations (Track 1, WSS 1)
Keywords: Physics-informed learning; informal economy; social capital; urban informality; insider epistemology; low-resource machine learning; South Africa; agent-based modelling; Gauteng
Presentation: Session 2.3; Wednesday 24 June; 12:00–12:20; Track 1; Venue: WSS 1

Abstract
Informal economies remain under-modelled in many African contexts because high-frequency formal transaction data are sparse or unavailable. This paper presents Marikovia, a data-efficient, physics-informed learning framework that estimates ward-level economic health from compact, high-signal indicators. The model defines economic energy as $E_e = V^a G_s^b / F^c$, where V captures economic velocity, G_s represents social gravity, and F captures structural friction. Using GCRO QoLS 2023–2024 microdata aggregated to 531 Gauteng wards, the model achieves $r = 0.863$ against an independent quality-of-life index, representing a $4.7\times$ improvement over baseline, with strong out-of-sample generalisation ($r_{\text{test}} = 0.848 \pm 0.063$). Stratified calibration reveals divergent parameter profiles, including social gravity dominance in primate urban Johannesburg, hyper-elastic social capital in secondary metros, and friction dominance in peri-urban areas. An agent-based micro-validation achieves $r = 0.914$ directional consistency and 100% state-classification agreement with the macro model. These findings demonstrate that insider epistemic knowledge, formalised as structural model constraints, can provide a decisive advantage in low-resource machine learning.

Submission 61

Assessing the Utility of Over-the-Counter Medication to Track Influenza Season Timing in a South African Population

Authors: Malebo Makunyane; Neville Sweijd; Jhandre Bredenkamp; Sibongile Walaza; Jonny Peter; Cheryl Cohen

Affiliation(s): University of Cape Town Lung Institute, South Africa; University of Cape Town, South Africa; Stellenbosch University, South Africa; Alliance for Collaboration on Climate and Earth Systems Science, South Africa; Clicks Retailers, Clicks Group Limited, South Africa; National Institute for Communicable Diseases of the National Health Laboratory Service, South Africa; University of the Witwatersrand, South Africa

Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics (Track 2, WSS 2)
Keywords: Influenza; surveillance; over-the-counter medication sales; time series analysis; forecasting; early warning systems; South Africa
Presentation: Session 2.3; Wednesday 24 June; 12:00–12:20; Track 2; Venue: WSS 2

Abstract

In low- and middle-income countries, laboratory-based influenza surveillance often has limited timeliness and spatial coverage. Alternative data streams, such as over-the-counter (OTC) medication sales, may provide earlier signals of population-level respiratory illness. This study evaluates whether OTC respiratory medication sales track seasonal influenza activity and provide early warning of influenza dynamics in South Africa using statistical and machine learning approaches. Daily OTC medication sales data from a national pharmaceutical chain were aggregated to weekly counts and analysed at national and provincial levels, focusing on Gauteng, KwaZulu-Natal, and the Western Cape. Weekly laboratory-confirmed influenza data were obtained from sentinel surveillance programmes for 2012–2019 and 2022–2023. Seasonal characteristics were quantified using the Moving Epidemic Method (MEM). Lead–lag relationships were assessed using cross-correlation functions. Short-term forecasting, from 1–5 weeks ahead, was performed using generalised linear models, Random Forest models, and OTC-only models incorporating autoregressive influenza terms, and was compared with a naive persistence baseline. Model performance was evaluated using root mean squared error (RMSE) for point prediction and area under the receiver operating characteristic curve (AUC) for detection of high-activity weeks. OTC respiratory medication sales consistently preceded increases in influenza detections at national and provincial levels. Sales-defined seasons began and peaked earlier than laboratory-confirmed influenza seasons in 70% of national seasons and 67–89% across provinces. Cross-correlation analysis indicated that OTC sales led influenza detections by 2–3 weeks, with peak correlations ranging from 0.86 to 0.93. OTC-informed models demonstrated strong short-horizon predictive performance, achieving AUC ≥ 0.90 at 1–2 weeks ahead. At the national level, AUC remained ≥ 0.90 through 3 weeks and > 0.85 at 5 weeks ahead. OTC medication sales provide a scalable and timely proxy for monitoring influenza dynamics and can support early detection of changes in community respiratory health. Integrating such data streams with routine surveillance systems may strengthen public health monitoring and forecasting capacity in resource-constrained settings.

Submission 7

Opportunities for Open Data Initiatives in Africa: Case Studies and Best Practices

Authors: Mary Mupemhi and Tariro R. Guta
Affiliation(s): Women's University in Africa

Scientific theme: Theme 4: Research Data Management, Open Data, Institutional Analytics, and Educational AI (Track 4, WSS 5)
Keywords: Africa, Civic engagement , Governance, Innovation, Open data
Presentation: Session 1.1; Wednesday 24 June; 09:45–10:05; Track 4; Venue: WSS 5

Abstract

Open data initiatives in Africa are rapidly gaining popularity as essential mechanisms for enhancing transparency, fostering innovation, and encouraging civic engagement. The continent faces significant challenges in governance, public health, and economic development, making the potential benefits of open data particularly pertinent. However, despite growing interest, the full scope of opportunities and challenges associated with open data initiatives remains underexplored. The successful implementation of open data initiatives requires a thorough understanding and strategic planning, particularly in the African context, where varying factors can impact outcomes. This study aims to evaluate the impact of open data initiatives on governance, public health, and economic development within diverse African contexts. By examining successful case studies and identifying best practices, the research seeks to provide insights into how open data can be effectively leveraged to address specific regional challenges. A comparative qualitative analysis was employed, focusing on multiple case studies from selected African countries known for their implementation of open data platforms. The methodologies involved are multifaceted, including interviews with key stakeholders such as policymakers, data practitioners, and community representatives. These interviews aimed to capture diverse perspectives on the objectives, challenges, and outcomes of open data initiatives. In addition, a thematic analysis of existing literature on open data practices in Africa was conducted to identify common drivers and barriers to successful implementation. This multi-method approach enables a comprehensive understanding of the open data ecosystem in the African context. However, the research also highlights critical barriers that hinder the widespread adoption of open data initiatives across the continent. Technological limitations are a significant challenge, with many regions lacking the necessary infrastructure to support open data platforms. Additionally, concerns about data privacy and protection impede both the willingness of organizations to share data and the public's trust in these initiatives. There is also a notable gap in public awareness regarding the benefits and uses of open data, which can limit community engagement and participation. This research contributes to the understanding of how open data initiatives can be tailored to fit the unique needs and contexts of African countries. As a result of drawing on successful examples and outlining best practices, this study aims to serve as a resource for policymakers, data practitioners, and stakeholders interested in harnessing the power of open data to drive social and economic advancement across the continent.

Submission 13

Using Machine Learning to Predict the Adsorption of Antibiotic Drugs onto Functionalised Lignocellulosic Materials Derived from Sawdust

Authors: Ibrahim Chikowe; Muhammad D. Bala
Affiliation(s): Kamuzu University of Health Sciences, Malawi; Korea University, Republic of Korea; University of KwaZulu-Natal, South Africa
Scientific theme: Theme 1: Statistical, Mathematical, and Computational Foundations of Data Science and AI
Keywords: Predictive modelling, Aqueous adsorption, Machine learning (ML), Principal component analysis (PCA), LASSO regression, STATA software, Antibiotic adsorption, Lignocellulosic materials, Nanometal-biopolymer composites, Adsorption efficiency and capacity
Presentation: Session 3.2; Thursday 25 June; 10:05–10:25; Track 1; Venue: WSS 1

Abstract

Predictive modelling has gained popularity in aqueous adsorption studies, and numerous studies have utilised both experimental and literature data. Various machine learning approaches and algorithms have been employed, each demonstrating varying efficiency across datasets, primarily utilising advanced machine learning models and software. In this study, principal component analysis (PCA) and regression (PCA-regression), and LASSO regression machine learning (ML)

approaches were used in the STATA software for predicting the adsorption of antibiotic drugs onto lignocellulosic materials and their nanometal-biopolymer composites (MBCs). The dataset comprised 70 variables and 24 observations and underwent preprocessing steps, including normalisation, PCA for dimensionality reduction, and outlier detection. The predictive accuracy of two machine learning models was also assessed. The two models identified the predictors of adsorption efficiency and capacity, namely surface charge, crystalline nature, and surface area. The model's performance was evaluated using 10-fold cross-validation, coefficient of determination (R2), root mean square error (RMSE) and mean absolute error (MAE). The PCA-regression model showed the best performance based on its highest R2 of 0.9977, followed by the LASSO's highest R2 of 0.52. These results demonstrate the robustness of the adsorption predictive models in identifying key factors that enhance adsorption performance, namely surface charge, crystallinity, and surface area, which can be 1 improved to advance adsorption efficiency and capacity. The ML approach validated the experimental results and uncovered crystallinity as an additional performance determinant overlooked by conventional analysis. 2

Submission 17

Decadal Tropospheric Ozone Trends Assessment in Two Major Cities in South Africa: Implications for African Data Infrastructure from Data Scarcity to Collaborations

Authors: Raeesa Moolla; Clinton Nyathi
Affiliation(s): University of the Witwatersrand, South Africa
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics (Track 2, WSS 2)
Keywords: Trophospheric Ozone, TOAR, Atmospheric Data, Seasonal Analysis, Trend Analysis, Multi-platform Data
Presentation: Session 1.1; Wednesday 24 June; 09:45–10:05; Track 2; Venue: WSS 2

Abstract

Tropospheric ozone (O_3) is a secondary pollutant with major effects on climate, human health, and environmental health, and its distribution and trends are shaped by complex interactions between chemical precursors, meteorological conditions, and anthropogenic emissions (Archibald et al., 2020; Gaudel et al., 2018). This study presents a decadal (2013–2023) assessment of tropospheric O_3 trends and seasonal variability over Cape Town and Johannesburg using an integrated multi-platform atmospheric data framework that leverages multi-platform observations; however, long-term observational analyses remain limited across Africa due to a lack of monitoring stations and data gaps (Thompson et al., 2017; Archibald et al., 2020; Bourgeois et al., 2020; Nickless et al., 2020; Langerman et al., 2023). To bypass this situation, multi-platform datasets were used, including MERRA-2 reanalysis, SHADOZ ozonesondes, EBAS surface observations, IAGOS aircraft profiles, and SOFT-IO source attribution, with time-series decomposition, trend analysis, and statistical correlation with meteorological variables (temperature, wind speed, and pressure) applied to characterise temporal dynamics and drivers of variability (Schultz et al., 2017; Thompson et al., 2017; Witte et al., 2018; Cooper et al., 2020; Chang et al., 2022; Langerman et al., 2023). Results reveal contrasting dynamics of urban tropospheric ozone: Johannesburg exhibits a stronger increasing trend in tropospheric concentrations (+1.04 ppb yr^{-1}), associated with urban emissions, biomass burning, and frequent atmospheric stagnation, whereas Cape Town shows a moderate increase (+0.62 ppb yr^{-1}), with variability strongly influenced by coastal meteorology, stratosphere–troposphere exchange, and wildfire activity. In both cities, carbon monoxide peaks during winter–spring correlate with enhanced ozone formation, which highlights the importance of combustion-related precursors, and temperature showed the strongest positive correlation with ozone ($r = 0.62$–0.75), while wind speed shows a negative association, reflecting dispersion effects. The analysis also demonstrates observational

vulnerabilities, including data losses linked to load shedding and, most importantly, reduced aircraft and ozonesonde operations during the COVID-19 period (Bauwens et al., 2020; Langerman et al., 2023), illustrating systemic challenges facing environmental data collection and continuity in Africa. By integrating heterogeneous atmospheric datasets across vertical layers, this work provides Southern Hemisphere evidence for the Tropospheric Ozone Assessment Report (TOAR) framework (Chang et al., 2019; Thompson et al., 2021), demonstrates the value of multi-source data fusion for environmental assessments, and supports targeted precursor mitigation in urban South Africa while highlighting the need for resilient, energy-secure monitoring networks, low-cost solar-enabled monitoring stations, and open environmental data infrastructure to enable data-driven air quality policy across Africa. Side notes: towns are shown in the linear regression trend analysis; long-term ozone increases of +1.04 ppb yr^{-1} in Johannesburg and +0.62 ppb yr^{-1} in Cape Town; temperature–ozone correlation in both cities, $r = 0.62$–0.75 (strong positive), representing the Pearson correlation coefficient; wind speed–ozone correlation shows a negative relationship in both cities; all relationships are represented by Pearson correlation and linear regression; CO–ozone [...].

Submission 26

Pandemic penalties and profitable misery: A decomposition and machine learning analysis of COVID-19 impacts inequalities in Gauteng, South Africa

Authors: Pedzisai Ndagurwa and Shamsunisaa Miles-Timotheus
Affiliation(s): University of the Witwatersrand
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics (Track 2, WSS 2)
Keywords: Machine learning, Decomposition analysis, Geographically weighted random forest, Quality of life, Inequality, COVID-19
Presentation: Session 1.2; Wednesday 24 June; 10:05–10:25; Track 2; Venue: WSS 2

Abstract
The COVID-19 pandemic demonstrated that global health emergencies amplify existing socio-spatial inequalities. However, few studies have systematically examined the determinants of inequality in COVID-19 outcomes in ways that reveal actionable socio-spatial patterns with policy relevance. This study contributes to filling this gap by analysing the drivers of socio-spatial disparities in quality of life (QoL) impacts of COVID-19 in Gauteng, South Africa, using data from the 2017/18 and 2020/21 Gauteng City-Region Observatory (GCRO) QoL surveys. Drawing on Kitagawa–Oaxaca–Blinder (KOB) threefold decomposition and Geographically Weighted Random Forest (GWRF) modelling, the study shows that the province's average QoL index declined from 64 to 61. The KOB results indicate that 39.9% of the decline was due to shifts in population composition (endowments) largely stemming from reduced satisfaction with provincial and local government, while 47.1% is attributable to changes in coefficients (returns to characteristics), and 13% to interaction effects. The GWRF analysis uncovers substantial spatial non-stationarity, revealing that the influence of factors such as migration status, population group, and perceptions of safety differ markedly across wards. The findings underscore that the spatially heterogenous QoL outcomes are shaped by complex, place-specific constellations, implying that policy responses must be spatially targeted and locally differentiated rather than uniform.

Submission 32

Hybrid unsupervised Interpretable Forecast Error Analysis for Grid Risk Prioritisation in Low-Resource Environments

Authors: Makomane Dorothea Lawretta Sekhoto, Akihiro Fujii and Naoya Tanaka
Affiliation(s): National Transmission Company South Africa
Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure (Track 3, WSS 4)
Keywords: Grid stability, Anomaly detection, Operational Clusters
Presentation: Session 1.2; Wednesday 24 June; 10:05–10:25; Track 3; Venue: WSS 4

Abstract
African power systems are under growing pressure from rising electricity demand, fluctuating renewable generation, and day-to-day operational constraints. Keeping the grid stable requires spotting unusual behavior early and understanding the conditions that cause it. Existing clustering-based anomaly detection frameworks focus on preprocessing or fault detection. However, few studies integrate density-based regime discovery with ensemble forecasting to prioritize operational risk under renewable variability. This study proposes a hybrid unsupervised–supervised pipeline that enables regime-aware forecasting for grid stress identification in low-resource systems. The study leverages openly available operational data from the South African power system to analyse grid performance using derived indicators such as demand stress, renewable ratio, outage ratio, dispatch ratio, and demand stress. Different operational clusters are identified, and stress-related anomalies are detected using a hybrid unsupervised learning approach that combines Density-Based Spatial Clustering of Applications with Noise (DBSCAN) clustering and eXtreme Gradient Boosting (XGBoost)-based forecasting. The findings demonstrate that clusters that reflect unstable grid conditions are strongly correlated with times of high dispatch ratios and increased renewable variability. In power environments with limited resources, the suggested framework shows a low-cost, scalable, and interpretable method for proactive grid monitoring.

Submission 46

AI-Driven Optimization of Informal Transport Networks Using Spatial Data Infrastructure: A Case Study of South African Minibus Taxi Systems

Authors: Limpho Letele
Affiliation(s): University of East London
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics (Track 2, WSS 2)
Keywords: Artificial Intelligence, Spatial Data Infrastructure, Informal Transport Systems, Urban Mobility Optimization, Geospatial Data Analytics, Minibus Taxi Networks, Machine Learning
Presentation: Session 1.3; Wednesday 24 June; 10:25–10:45; Track 2; Venue: WSS 2

Abstract
Informal transport systems play a critical role in urban mobility across Sub-Saharan Africa. In South Africa, minibus taxis account for the majority of commuter trips but remain poorly integrated into formal transport planning systems. Despite their importance, existing research has largely focused on mapping and descriptive analysis of informal transport networks rather than predictive optimization using artificial intelligence. Additionally one of the key challenges limiting effective coordination of transport systems is the absence of well-developed Spatial Data Infrastructures (SDIs) to support data sharing, governance, and digital integration across institutions. This study investigates how Artificial Intelligence (AI) can be leveraged within government-supported Spatial Data Infrastructure frameworks to optimize informal transport networks and improve urban mobility outcomes. The research integrates geospatial datasets including road network information from OpenStreetMap, population distribution

data from WorldPop, and route structures derived from the Digital Matatu dataset. These datasets are combined within an SDI-enabled analytical environment to model spatial mobility dynamics and passenger demand patterns. Machine learning techniques including gradient boosting and spatial clustering are applied to predict demand hotspots and detect inefficiencies within existing transport routes. Graph-based network analysis is then used to simulate route optimization strategies that could improve network efficiency and commuter accessibility. The study further examines the role of government-led SDI initiatives in enabling data interoperability, institutional collaboration, and scalable digital transport planning. The findings highlight how integrating AI-driven analytics with national spatial data infrastructures can support more coordinated and data-driven transport governance in rapidly growing cities. The research contributes to the development of intelligent mobility systems aligned with SDG 11 and SDG 9.

Submission 60

Improving Feature Representations for Few-Shot Classification of Neglected Tropical Diseases on Dark Skin Tones

Authors: Felix Obete; Ian Raymond Osolo; Michael-Ahile Terhemba
Affiliation(s): Uganda Christian University, Uganda
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics (Track 2, WSS 2)
Keywords: Few-Shot Classification, Domain Adaptation, Supervised Contrastive Learning, Neglected Tropical Skin Diseases, Dark Skin Tones
Presentation: Session 2.1; Wednesday 24 June; 11:20–11:40; Track 2; Venue: WSS 2

Abstract

Transfer learning mitigates the challenge of limited labeled data in deep learning by using knowledge from pretrained models and fine-tuning them for new tasks. However, in scenarios of extreme data scarcity, such as rare medical conditions, few-shot classification becomes essential. This approach relies heavily on the quality of feature representations learned by a pre-trained model. A key challenge is enabling these models to produce discriminative and transferable representations of target domains that differ significantly from the source domain. In this study, we investigate strategies to improve feature representations from pre-trained models for few-shot classification of Neglected Tropical Skin Diseases (NTDs) on dark skin tones. We propose a sequential framework that first applies supervised domain adaptation to align representations with dermatology images of darker Fitzpatrick skin types (IV–VI), followed by supervised contrastive learning(SupCon) to improve inter-class separability and representation robustness under data scarcity. Using densenet161 and vit b 16, identified as the most effective dermatology feature extractors on Fitzpatrick17k and SD-198 datasets, we evaluate the impact of the framework on fewshot classification performance. The results show consistent improvements across training stages. Densenet161 improved from 53.33% to 63.33% accuracy in 5-way 5-shot setting after domain adaptation and 62.00% to 70.00% in 3-way 2-shot setting after SupCon. Similarly, vit b 16 improved from 53.33% to 73.33% in 5-way 5-shot setting and 62.50% to 72.50% in 3-way 5-shot setting after SupCon. These findings show that combining domain adaptation with supervised contrastive learning improves representation quality and enables more reliable few-shot recognition of NTDs in dark skin tones.

Submission 65

Forecasting Exchange Rate Using LSTM and VARX

Authors: R. Nemudzivhadi
Affiliation(s): North-West University, South Africa
Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure (Track 3, WSS 4)
Keywords: Long Short-Term Memory (LSTM) neural network, Vector Autoregression model with exogenous variables (VARX), Exchange rate - ZAR/USD, normalisation and stationarity test Root mean square error (RMSE), Mean Absolute Error (MAE), Mean Absolute Percentage Error (MAPE), hybrid Model
Presentation: Session 2.4; Wednesday 24 June; 12:20–12:40; Track 3; Venue: WSS 4

Abstract
This study compares the performance of the Long Short-Term Memory (LSTM) neural network and the Vector Autoregressive model with exogenous variables (VARX) in order to investigate the use of complex time series modelling techniques to forecast the South African Rand (ZAR) exchange rate against the USD. The aim of the study is to compare the two models, i.e., VARX and LSTM, their accuracy, model's interpretability and adaptability in forecasting the exchange rate. To achieve this, two independent variables were introduced: Prime Lending rate and Treasury bills 95-day rate to gain a better understanding of their influence on the exchange rate. Data pre-processing methodologies were introduced before modelling the data, which included normalisation and stationarity tests. The data was then split into train and test. The accuracy of forecasting for both models was compared using statistical techniques: Root Mean Squared Error (RMSE), Mean Absolute Error (MAE) and Mean Absolute Percentage Error (MAPE). Based on these metrics, the results show that LSTM outperformed VARX, thus correctly capturing non-linear patterns and complex market volatilities. On the other hand, VARX has been shown to have improved interpretability, demonstrating the impact of monetary policy variables on exchange rate volatility. The study concludes that although LSTM outperforms VARX, VARX is still important for understanding how micro and macroeconomic factors impact the exchange rate. In order to improve the accuracy of predicting exchange rates, future research should focus on introducing hybrid approaches that would integrate the benefits of the two models within the study.

Submission 81

Refining Wastewater Surveillance through Regression Kriging for Spatial Prediction of COVID-19 Incidence

Authors: Odey Mofokeng; Raeesa Manjoo-Docrat; Inger Fabris-Rotelli; Pravesh Debba; Jenny Holloway; Nontembeko Dudeni-Tlhone; Jabulani Jele; Wouter le Roux; Lisa Schaefer; Rene Stander; David Rose.
Affiliation(s): University of the Witwatersrand
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Keywords: Regression Kriging, wastewater surveillance,; COVID-19, spatial prediction, geostatistics, early warning
Presentation: Session 3.3; Thursday 25 June; 10:25–10:45; Track 1; Venue: WSS 1

Abstract
Wastewater-based epidemiology (WBE) has emerged as a valuable complement to clinical surveillance for infectious disease monitoring, yet integrating environmental and clinical data across mismatched spatial scales remains a methodological challenge. This study develops a Regression Kriging (RK) framework that combines multivariate linear regression with geostatistical interpolation of residuals to predict weekly COVID-19 incidence at the subplace level in the Ekurhuleni Metropolitan

Municipality, South Africa, with a four-week early warning horizon. A spatial disaggregation framework was implemented to reconcile differences between COVID-19 case data (six health sub-districts), wastewater gene concentrations (eight treatment plants), and vulnerability covariates (640 subplaces). Population-weighted areal interpolation was used to disaggregate case data, while a hierarchical three-stage mapping approach linked subplaces to treatment plants. Variable selection using LASSO regularisation, variance inflation factor screening, and domain knowledge produced six predictors with low multicollinearity. The RK model achieved a mean R-squared of 0.759 under week-by-week spatial 10-fold cross-validation, outperforming a RegressionOnly model (R-squared = 0.683) and demonstrating substantial gains from residual interpolation. Performance improved across successive pandemic waves, and residual Moran's I of 0.672 confirmed strong spatial dependence captured by the Kriging component. A gene threshold-based early warning approach failed to detect any wave onsets (sensitivity = 0), confirming that the predictive value of wastewater signals emerges through multivariate spatial modelling rather than simple threshold alarms.

Submission 84

Responsible AI and Data Governance in Africa: Readiness of Public–Sector Systems in Fragile Context

Authors: Abdulkadir Mohamed Gedi
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Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure (Track 3, WSS 4)
Keywords: Responsible AI, data governance, AI readiness,; Africa, fragile contexts, public sector
Presentation: Session 3.1; Thursday 25 June; 09:45–10:05; Track 3; Venue: WSS 4

Abstract

Across Africa, public administrations are increasingly turning to artificial intelligence (AI) to enhance public service delivery. However, readiness remains uneven across the continent. A UNESCO survey of 32 African countries found that 71% consider personal data protection and data governance to be urgent priorities, while 19 countries report significant gaps in legal frameworks and human-resource capacity for AI governance. Only six countries indicated that they possess adequate capacity to address the ethical implications of AI. Similarly, the 2025 Government AI Readiness Index highlights that high-performing governments are characterised by clear national AI strategies, well-defined accountability structures and robust ethical frameworks. In contrast, countries lacking these foundational elements experience fragmented implementation efforts despite growing technical potential. Data foundations represent another major divide: interoperable systems, secure digital infrastructure and high-quality datasets remain unevenly distributed across African states. These limitations constrain AI deployment and increase risks related to bias, data quality and accountability. This paper assesses the readiness of public-sector systems across Africa – particularly in fragile contexts – to implement responsible AI. Drawing on cross-country indices, policy analysis and comparative case studies, the study evaluates legal and regulatory environments, institutional capacity, data governance maturity and ethical oversight mechanisms. Building on the Broadband Commission's 4P data-governance framework (Purpose, Principles, People and Practices), the paper proposes a multidimensional readiness model to identify systemic strengths and persistent gaps. Preliminary findings suggest that while political commitment and emerging continental frameworks provide a promising foundation, effective implementation requires sustained investment in human capital, interoperable data infrastructure, regulatory capacity and rights-based governance mechanisms. The paper concludes with policy recommendations emphasising context-sensitive capacity building, open-data and interoperability reforms and inclusive multi-stakeholder engagement to ensure AI systems contribute to equitable, transparent and accountable public governance across Africa.

Submission 88

Predictive Synthesis-Properties Mapping Of Hydrothermally Developed Tio2-Go Nanocomposite For Seawater Electrolysis

Authors: Zainab Ibraheem, Maurice Onyango, Mokgadi Bopape, Ishmael Ramatsa
Affiliation(s): Tshwane University of Technology
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Keywords: Hydrothermal Synthesis, Seawater Electrolysis, Bifunctional Electrocatalyst, Machine Learning and Green Technology
Presentation: Session 4.2; Thursday 25 June; 11:40–12:00; Track 2; Venue: WSS 2

Abstract

This study focuses on the development and optimisation of a titanium(IV) oxide (TiO_2 anatase)–graphene oxide (GO) nanocomposite as an efficient and stable electrocatalyst for seawater electrolysis. The research addresses the limitations of conventional noble metal catalysts, such as high cost and limited durability, by employing a cost-effective, data-driven approach to design and synthesis. The TiO_2–GO nanocomposite will be synthesised via a hydrothermal method, where key parameters, including the TiO_2:GO ratio, reaction temperature, and reaction duration, will be systematically varied. Physicochemical characterisations, including scanning electron microscopy (SEM) and energy-dispersive spectroscopy (EDS) for morphology and elemental composition, X-ray diffraction (XRD) for crystallinity and phase structure, Fourier transform infrared spectroscopy (FTIR) for functional group identification, and Brunauer–Emmett–Teller (BET) analysis for surface area and porosity, will be performed to evaluate material properties. Experimental data will then be analysed using statistical and machine learning techniques, including Random Forest, Gradient Boosting, and Support Vector Machine models, to establish quantitative structure–activity relationships (QSAR) and identify optimal synthesis conditions. The expected outcome is a TiO_2–GO nanocomposite exhibiting enhanced catalytic activity, stability, and surface properties suitable for seawater electrolysis applications. Beyond improving catalyst design, this research demonstrates a sustainable, data-driven framework for material optimisation, contributing to the advancement of green hydrogen production and supporting South Africa's Hydrogen Society Roadmap toward a low-carbon energy future.

Submission 91

An Attention-Weighted Random Forest Regressor for Dynamic Tree Contribution Modelling in Context-Aware Ensemble Learning

Authors: Martins Arasomwan
Affiliation(s): Sol Plaatje University
Scientific theme: Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations (Track 1, WSS 1)
Keywords: Machine Learning, Deep Learning, Artificial Intelligence, Data Science, Attention, Random Forest, Regressor, Context-Aware, Ensemble Learning
Presentation: Session 1.2; Wednesday 24 June; 10:05–10:25; Track 1; Venue: WSS 1

Abstract

Ensemble learning methods such as Random Forests (RF) are strong in many applications due to

their robustness and variance-reduction capability. However, a key limitation of RF lies in the reliance on uniform averaging, where each decision tree contributes equally to the final prediction irrespective of the input data. This assumption can be suboptimal when dealing with heterogeneous data sets that have different areas of the feature space that require different tree knowledge. To address this gap, a novel hybrid model called Attention-Weighted Random Forest Regressor (AWRFR) is proposed to fuse transformer-based attention technology with ensemble aggregation methods. The model views decision trees as tokens whose predictions are assigned dynamic weights through an attention function that is designed to learn to connect with specific input features. This ability is exploited by the model to determine which trees to use based on their relevance to the input features, thereby creating context-based ensemble behaviour. AWRFR is evaluated on a set of standard regression datasets and its efficiency is compared against basic RF and other ensemble variants. The experimental results demonstrate that the proposed model consistently improves predictive accuracy, particularly in datasets with high feature diversity and complex feature relationships. Additionally, analysis of attention distributions provides insights into the model's interpretability by revealing which trees are most influential under varying conditions. The proposed solution bridges the gap between traditional ensemble techniques and modern deep learning architectures by providing a prediction method that can adapt to different contexts while retaining a flexible and scalable architecture. Future work will develop and explore extensions to classification settings and optimization techniques for reducing computational costs.

Submission 93

Data Science and Machine Learning for Healthcare Demand Forecasting in Angola

Authors: Yuri Pedro, Jean-Pierre Caliste and Imaculada Quinda.
Affiliation(s): Universidade Agostinho Neto
Scientific theme: Theme 3: Health, Bioinformatics, Geospatial, Environmental, Climate, Agricultural, and Urban Analytics
Keywords: Data Science, Demand Forecasting, Machine Learning, Public Health in; Angola
Presentation:

Abstract
Healthcare systems often face significant strain due to limited resources and increasing demand, leading to prolonged waiting times and inefficient use of hospital beds and staff. In settings with strong seasonal patterns such as Angola, where endemic diseases are influenced by climatic conditions purely reactive management approaches are no longer sufficient. This study proposes a data-driven architecture designed to forecast patient demand and support the dynamic allocation of hospital resources. The methodology includes the development of a data engineering pipeline to process historical admission records, enriched with external variables such as weather data and seasonal trends. Machine learning techniques for time series analysis are employed, combining statistical models and recurrent neural networks to anticipate peaks in healthcare demand. The expected outcome is a shift toward more proactive hospital management, enabling better decision-making in workforce planning, bed allocation, and supply management. The study highlights the feasibility of integrating data-driven solutions into healthcare systems, particularly in resource-constrained environments, improving operational efficiency and enhancing the overall quality of patient care.

Submission 99

A Hybrid Hidden Markov Model and XGBoost Approach to

Volatility Modelling of the JSE Top 40 Index

Authors: Madege Fhulufhedzani Justice; Ravele Thakhani; Sigauke Caston
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Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure (Track 3, WSS 4)
Keywords: Extreme Gradient Boosting; Forecasting; Hidden Markov Model.; 1
Presentation: Session 2.2; Wednesday 24 June; 11:40–12:00; Track 3; Venue: WSS 4

Abstract

Modelling and forecasting stock market volatility is one of the outstanding problems faced by financial analysts and economics professionals in the practice of investment, and risk modelling and forecasting of option prices. In this work, we propose a hybrid modelling system that combines a Hidden Markov Model (HMM) and Extreme Gradient Boosting (XGBoost) to analyse and forecast volatility of the JSE Top 40 Index, and to examine the impact of different state-level markets using log-return series. In the first step, we use HMM to identify various market regimes for both short and long historical regimes and expose the various regime oscillations and time-varying dynamics that characterise financial return series, where and in which the volatility is observed in different states is predicted, so that we can account for the complex relations in the different states. This model can be built on the strengths of both methods: the HMM can model unobserved state dynamics in the system's behaviour, whereas XGBoost is known to handle non-linear fluctuations. In the view of the current study, the methodology is still in development, as are the expected advantages of hybrid modeling. An integration of regime identification before machine learning analytics could be achieved to generate estimates. The study adds to the existing literature on hybrid volatility modelling and provides a practical framework for investigating financial market volatility in emerging markets.

Submission 100

Multi-Horizon Volatility Forecasting of the JSE ALSI Using a Hybrid APARCH–LSTM Framework

Authors: Mulweli Netangula
Affiliation(s): South African Financial Markets Using News; Sentiment and Macroeconomic Indicators
Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure (Track 3, WSS 4)
Keywords: Volatility forecasting, deep learning, news sentiment, macroe-; conomic indicators, multi-horizon prediction, Johannesburg Stock Exchange; 2
Presentation: Session 1.1; Wednesday 24 June; 09:45–10:05; Track 3; Venue: WSS 4

Abstract

Accurate forecasting of stock market volatility is critical for risk management, portfolio optimization, and informed decision-making. Traditional volatility models, such as GARCH, often struggle to capture nonlinear market dynamics and fail to incorporate the influence of market sentiment and macroeconomic conditions. This study proposes a novel deep learning-based fusion framework that integrates financial news sentiment and local macroeconomic indicators to enhance volatility forecasts for the Johannesburg Stock Exchange across multiple time horizons (daily, weekly, and monthly). News sentiment is extracted using natural language processing techniques, while macroeconomic variables include interest rates, inflation, and exchange rate movements. Market data are sourced from

Yahoo Finance and Alpha Vantage, while macroeconomic indicators are obtained from the World Bank and the International Monetary Fund. News sentiment is extracted from South African financial news using natural language processing techniques. The framework employs Long Short-Term Memory (LSTM) networks to model temporal dependencies across daily, weekly, and monthly horizons. Model development and empirical evaluation are currently in progress. The proposed framework offers a holistic understanding of market dynamics by capturing both sentiment-driven and macroeconomic influences, contributing to improved predictive performance in emerging market contexts. 1

Submission 101

Enhancing Short-Term Wind Energy Forecasting with XGBoost and Conformal Prediction for Robust Uncertainty Quantification

Authors: Nthangeni Rabelani Innocent; Caston Sigauke; Thakhani Ravele
Affiliation(s): University of Witwatersrand, South Africa
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics (Track 2, WSS 2)
Keywords: conformal prediction, model calibration, probabilistic forecasting, quantile; regression averaging and wind energy.; 1
Presentation: Session 2.2; Wednesday 24 June; 11:40–12:00; Track 2; Venue: WSS 2

Abstract

This study presents probabilistic wind energy forecasting using quantile regression averaging combined with a conformal prediction modelling framework. The study uses data from Eskom, South Africa's power utility company. The data is from April 2019 to November 2023. A partial linear additive quantile regression (PLQR) averaging method is used to combine forecasts from two competing forecasting models: eXtreme Gradient Boosting (XGBoost) and Principal Component Regression (PCR). To compare the predictive abilities of the models, two data splits are used: 80%, 10% and 10% for the first set, and 85%, 10% and 5% for the second set. Empirical results suggest that the combined predictions from PLAQR perform better than the individual models, significantly improving calibration and accuracy. The proposed combination has the smallest root mean square error (RMSE) and the highest probability of change in direction (POCID). The combination captures nonlinearities and produces well-calibrated probabilistic results. Probability integral transform histograms validate this. This performance gain reflected the importance of data volume. This is reinforced by the fact that the PLAQR model, which combines the benefits of tree-based approaches and linear models, is a robust modelling approach for reliable renewable energy forecasting. Future research directions should consider more varied ensembles.

Submission 102

A Comparative Analysis of Traditional Machine Learning and Deep Learning Techniques for Money Laundering Detection

Authors: Ronewa Nephiphidi; Ndivhuwo Ndou
Affiliation(s): University of Venda, MSc e-Science; University of Venda
Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure (Track 3, WSS 4)

Keywords: Machine Learning, Deep Learning, Graph Neural Networks, LSTM, XGBoost, SVM, Autoen-; coders, Financial Crime; 1
Presentation: Session 2.3; Wednesday 24 June; 12:00–12:20; Track 3; Venue: WSS 4

Abstract
Money laundering remains a critical challenge to global financial systems, particularly in developing economies such as South Africa, where illicit financial flows undermine economic stability and regulatory effectiveness. The growing complexity, volume, and interconnected nature of financial transactions limit the effectiveness of conventional detection approaches, necessitating more advanced data-driven solutions. This study aims to compare the effectiveness of traditional machine learning and deep learning techniques in detecting money laundering activities within financial transaction data. The study utilises the IBM Transactions for Anti-Money Laundering (AML) dataset, a synthetic yet realistic dataset designed for financial crime detection research. Multiple models are implemented, including Support Vector Machines (SVM) and XGBoost as traditional approaches, alongside Long Short-Term Memory (LSTM) networks and Graph Neural Networks (GNN) as deep learning techniques. In addition, Autoencoders and K-Means clustering are incorporated to enhance anomaly detection and pattern discovery. The methodology involves data preprocessing, feature engineering, and model training, with performance evaluated using accuracy, precision, recall, and F1-score. It is anticipated that deep learning models, particularly LSTM and GNN, will demonstrate superior performance in detecting complex and evolving money laundering patterns compared to traditional machine learning approaches. These models are expected to effectively capture temporal dependencies and relational structures within transactional data, while traditional models may perform well on structured classification tasks but struggle with more complex laundering behaviours. The study is expected to provide valuable insights into the comparative strengths of different machine learning approaches for anti-money laundering applications and contribute to the development of more effective, scalable, and intelligent financial crime detection systems.

Submission 113

Computational Food Identity: A Multidimensional Data Model for Algorithmic Food Certification

Authors: Jean Franck Galliano
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Scientific theme: Theme 4: Research Data Management, Open Data, Institutional Analytics, and Educational AI (Track 4, WSS 5)
Keywords: Food Data Science, Computational Food Identity, Multidimensional Data Models, Tensor Representation, Algorithmic Certification, Food Knowledge Graph
Presentation: Session 1.2; Wednesday 24 June; 10:05–10:25; Track 4; Venue: WSS 5

Abstract
Food certification systems such as geographical indications and quality labels rely on fragmented administrative processes and monodimensional representations of food products, limiting their integration into modern data-driven infrastructures. This paper introduces a data science framework for representing food products as multidimensional computational entities. We propose the concept of Computational Food Identity, implemented through a multidimensional representation integrating geographic, biological, cultural, environmental, social, and legal attributes. The proposed representation, referred to as the Multidimensional Food Digital Twin (MFDT), transforms heterogeneous food data into structured feature vectors encoded as tensor representations. Based on these representations, we introduce a computational certification mechanism in which dimension-specific scoring functions generate algorithmic micro-certifications associated with different

attributes of the product. The framework also supports the construction of a food knowledge graph linking products, producers, territories, and ecosystems, enabling relational analysis and potential graph-based machine learning applications. A prototype implementation illustrates how heterogeneous food data can be encoded within the MFDT representation and used to generate multidimensional certifications informed by a mixed-method field study conducted in Grand-Bassam, Côte d'Ivoire, among small-scale women attiéké producers to assess the feasibility and potential impact of a smartphone-based application for direct multidimensional data collection.

Submission 116

AI for Scientific Integrity: Evaluating LLMs in Automated Critical Appraisal of Biomedical Research

Authors: Kaela Kokkas, Robert Breiman, Bruce Bassett, Hairong Wang, Richard Klein, Mohammad Zaid Moonsamy and Emmanuel Sekyi
Affiliation(s): University of the Witwatersrand
Scientific theme: Theme 2: African Language Technologies, Natural Language Processing, Speech, and Multimodal AI
Keywords: Large Language Models (LLMs), Scientific Critical Appraisal, AI-Assisted Peer Review, Biomedical Text Analysis
Presentation: Hall: WSS 2, Date: Thursday 25 June, Time: 09:20-09:40

Abstract

Background: Ensuring the accuracy, consistency, and integrity of scientific literature in biomedicine is critical, yet identifying subtleties such as statistical errors, internal contradictions, and inappropriate citations remains time-consuming and cognitively demanding for authors, reviewers, and researchers. Large Language Models (LLMs) offer a potential solution, however, there is limited empirical evidence assessing their ability to reliably detect nuanced errors within complex scientific texts under realistic, multi-task conditions requiring context-switching and detection of "needle-in-a-haystack" inconsistencies. Methods: We benchmark LLMs (Gemini 2.5 Pro, Gemini 2.5 Flash, GPT-5, and GPT-5 Nano) on automated critical appraisal of biomedical literature across 3 domains: internal consistency, statistical reasoning, and citation relevance. The validation dataset was created by manual evaluation of 13 biomedical research papers, on the topic of Mouse Mammary Tumour Virus-Like Virus and breast cancer, looking for internal contradictions, errors in statistical analysis and results presentation, and relevance of citations. Results: Performance was heterogeneous across models and tasks. Assessment of internal consistency of full-texts presented the most significant challenge, with LLMs providing some fabricated contradictions and failing to identify most human-annotated contradictions. Isolation of contradictory sections improved detection rates markedly, indicating that context window limitations, rather than lack of capability, were a primary constraint. Across statistical appraisal tasks, models inconsistently identified human-annotated errors but detected issues missed by human evaluation. GPT-5 identified irrelevant citations in one paper that were missed by the human evaluator. Conclusion: These findings highlight both the promise and risks of deploying generalist LLMs for AI-assisted scientific critical appraisal. While they show potential to augment peer review and post-publication auditing, their susceptibility to hallucination and sensitivity to long-context inputs necessitate cautious integration. Poor performance in full-text settings underscores the need for methodological advances to mitigate context window limitations. This work contributes to responsible AI in data science and has implications for strengthening research quality in health and other data-driven domains.

Submission 122

Teaching Machines to Respect Physics: A Framework for Integrating Scientific Machine Learning into Undergraduate CFD Education

Authors: Muaaz Bhamjee and Ken J. Craig
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Scientific theme: Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations (Track 1, WSS 1)
Keywords: Physics-Informed Neural Networks, Scientific Machine Learning, Engineering Education, Computational Fluid Dynamics, ECSA Graduate Attributes, Surrogate Modelling
Presentation: Session 1.3; Wednesday 24 June; 10:25–10:45; Track 1; Venue: WSS 1

Abstract

Numerical simulation, and computational fluid dynamics (CFD) in particular, has become ubiquitous in engineering practice, underpinning design, optimisation, research and development across virtually every engineering discipline. The broad adoption of these tools reflects both the maturity of the underlying mathematical methods and the depth of physical understanding they encode. Engineering curricula have responded accordingly, integrating computational methods into the core education of undergraduate engineers. In the South African context, this imperative is formalised through the Engineering Council of South Africa (ECSA) Graduate Attribute 5, which requires graduating engineers to demonstrate the ability to use, select, and where necessary create modern engineering and information technology tools. To meet these requirements, the fourth-year Computational Fluid Dynamics module at a residential university in Gauteng, South Africa has undergone significant pedagogical development, blending lecture-based theoretical instruction with structured project-based learning. The aim is twofold: to provide students with practical, contextually grounded experiences that demand genuine application of computational theory, spanning internal flow and heat transfer in a Formula 1 sidepod, external flow over an aerofoil, and transient heat conduction in a Weber grill; and to build the depth of competency needed to critically evaluate, select, and apply computational tools based on their recognised limitations.

Submission 123

Parameter Recovery Properties of the Linear Mixed Model for Longitudinal Child Growth Analysis: A Monte Carlo Simulation Study in the PROMOTE Cohort

Authors: Mthobisi Mxolisi Zondi, Henry Godwell Mwambi, Fanta Sileshi Melesse, Nonhlanhla Yende-Zuma
Affiliation(s): University of KwaZulu Natal
Scientific theme: Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations (Track 1, WSS 1)
Keywords: linear mixed models, Monte Carlo simulation, growth mixture modelling
Presentation: Session 4.2; Thursday 25 June; 11:40–12:00; Track 1; Venue: WSS 1

Abstract

Background: HIV-exposed uninfected (HEU) children are an increasing population across sub-Saharan

Africa, yet their long-term growth trajectories remain poorly understood. Few observational studies have included contemporaneous HIV-unexposed uninfected (HUU) comparison groups, making it difficult to determine how early-life HIV exposure, in the absence of infection, influences growth outcomes relative to unexposed peers. This knowledge gap limits our understanding of the developmental risks and needs specific to HEU children. Methods: A Monte Carlo simulation (R = 1000 replications) generated synthetic HUU growth data (N = 1472) calibrated to published sub-Saharan Africa parameter estimates. A linear mixed model with fractional polynomial time terms was evaluated for parameter recovery across varying sample sizes, variance structures, and worst case scenarios. Growth mixture modelling was applied to simulated HIV-unexposed, uninfected data to assess its ability to recover known latent trajectory classes. Results: The linear mixed model demonstrated robust parameter recovery: bias remained below 0.05 for fixed effects, coverage exceeded 0.93, and convergence exceeded 0.90 under standard conditions. Growth mixture modelling accurately recovered the predefined trajectory subgroups from simulated HIV-unexposed, uninfected data, confirming the model's capacity to identify latent growth patterns in the absence of empirical reference data. Conclusion: Simulation derived HIV unexposed uninfected data provide a valid empirical reference for evaluating HIV exposed uninfected growth trajectories in longitudinal studies. The validated linear mixed model and growth mixture modelling approach establish a methodologically rigorous framework for long-term growth analysis in HIV-exposed uninfected populations compared to HIV-unexposed uninfected populations across sub-Saharan Africa.

Submission 124

Guided Weakly Supervised Machine Learning for Resonance Searches in High Energy Physics

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Scientific theme: Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations (Track 1, WSS 1)
Keywords: Machine Learning, Weak Supervision, Graph Neural Networks, Rare Signal Detection, Representation Learning
Presentation: Session 2.1; Wednesday 24 June; 11:20–11:40; Track 1; Venue: WSS 1

Abstract

Detecting rare signals in large, high-dimensional datasets is a fundamental challenge in machine learning, particularly when instance-level labels are scarce or unavailable. This problem arises naturally in scientific domains such as highenergy physics, where searches for new resonances at hadron colliders often rely on fully supervised methods and are optimized for high signal-to-background regimes. Such approaches may miss subtle signals in less explored regions of the data. In this work, we investigate a guided weak supervision framework for resonant signal detection in proton–proton collision data at the Large Hadron Collider (LHC). Instead of relying on event-level labels, we adopt a weak supervision paradigm, where a model is trained to distinguish between samples with different signal proportions. Weak labels are constructed using domain-informed selections that define signal-enriched and background-dominated regions. To model variable-sized structure of collision events, we employ a Graph Neural Network (GNN), representing each event as a graph of interacting objects. Our results demonstrate that combining weak supervision with graph-based representation learning improves sensitivity to low-signal regions, highlighting the potential of this approach for uncovering subtle patterns in weakly labeled, structured data.

Submission 144

Global Bias in Multimodal AI: A Cross-Architecture Evaluation of Vision-Language Models

Authors: Abass Oguntade, Ibukun Oduntan, Iremide Oyelaja, Chisom Chibuike, Tosin Adekunle
Affiliation(s): Stellenbosch University; ML Collective
Scientific theme: Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations (Track 1, WSS 1)
Keywords: Vision-Language Models, Zero-Shot Classification, Geographic Bias, Socioeconomic Bias, Multimodal Learning, Fairness and Equity, Benchmarking, Cross-Cultural Generalization
Presentation: Session 4.1; Thursday 25 June; 11:20–11:40; Track 1; Venue: WSS 1

Abstract

Multimodal AI models are increasingly deployed globally. They often inherit Western and high-income biases from web-scale training data. To assess whether these biases are architecture-specific or consistent across model paradigms, we evaluate three vision-language models representing distinct approaches: CLIP (contrastive), Qwen2-VL (open-source generative), and Gemini (closed-source generative), in a zero-shot setting on Dollar Street. This dataset spans 63 countries across Africa, the Americas, Asia, and Europe and contains images of households with wide income variation. We use a balanced 977-image subset preserving geographic and socioeconomic distributions. The task is constrained image classification without fine-tuning. CLIP predictions use cosine similarity between image and text embeddings. Qwen2-VL and Gemini rely on structured prompting with deterministic outputs. We standardize evaluation and define an error taxonomy covering misclassification, hallucination, abstention, and prediction collapse. Qwen2-VL achieves the highest accuracy at 92.94% ± 1.75, followed by Gemini at 89.15% ± 1.95 and CLIP at 87.31% ± 2.16. All models show strong disparities across Africa, Asia, Europe, and the Americas. Performance is highest in Europe and lowest in Africa and Asia. Regional gaps reach 14.37 percentage points. Income-based gaps reach 28.77 percentage points. Intersectional analysis shows equity gaps exceeding 35 percentage points for low-income populations in Asia. Models perform well on universal objects but fail on culturally specific categories, including portraits. These results reveal persistent geographic and socioeconomic bias in state-of-the-art multimodal systems. They highlight the need for inclusive training data and evaluation frameworks for responsible global AI deployment.

Submission 151

Data Governance in the Digital Age: Assessing Organisational Readiness in Tanzania's Public Sector

Authors: Edger Rutatola, Tupokigwe Isagah, Bahati Ilembo, Irene Isibika, James Marandu, Hoja Shibala, Rajabu Mgonja, Lunodzo Mwinuka, Almasi Maguya and Koenraad Stroeken
Affiliation(s): Mzumbe University
Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure
Keywords: data governance, organisational readiness,; Tanzania public sector, data-driven solutions, Technology-; Organisation-Environment (TOE) framework, fair use of data
Presentation: Session 2.1; Wednesday 24 June; 11:20–11:40; Track 3; Venue: WSS 4

Abstract
Governing data in the digital era is imperative to promote ethical and responsible use of personal data by organisations. Using data from existing information systems, organisations can make informed decisions that may contribute to sustainable development. Such a process requires quality and well-represented data to make fair and reliable decisions. Achieving this demands robust data governance at the national and institutional level to ensure data quality and fair use. However, such a data governance approach remains a challenge. Looking into the Tanzanian context, there is limited research on what is needed for the public sector to govern data effectively. This study bridges the gap by exploring available organisationallevel data governance initiatives that support fair and ethical data accessibility and use for responsible data-driven solutions in Tanzania. Guided by a quantitative research design, we used a questionnaire to explore data governance initiatives available at the organisational level in the Tanzanian public sector. A total of fifty-one (51) respondents, constituting statisticians, ICT personnel, and planning officers from government ministries, departments, and agencies (MDAs), responded to the survey. The findings reveal that organisational readiness for data governance remains fragmented and at an early stage of development. Most institutions rely on international or national-level frameworks with limited internal strategies to govern their data. While some operational practices, such as data handling procedures and documentation are in place, gaps still exist in policy enforcement, institutional collaboration, role definition, and capacitybuilding initiatives. We recommend the development of contextspecific governance frameworks, the enhancement of institutional structures and coordination mechanisms, and the investment in continuous capacity building to support fair access and use of data for responsible data-driven public sector transformation.

Submission 160

Applying behavioural science to AI chatbot design: A usability testing methodology for WhatsApp-based healthcare

Authors: Kitso Setswe, Caroline Govathson, Ross Greener, Sophie Pascoe, Brendan Maughan-Brown, Lezanie Coetzee, Letitia Rambally-Greener, Ndumiso Madubela, Shawn Malone, Shawna Cooper and Candice Chetty-Makkan
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Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics (Track 2, WSS 2)
Keywords: Usability testing, Responsible AI design, Digital health tools
Presentation: Session 2.4; Wednesday 24 June; 12:20–12:40; Track 2; Venue: WSS 2

Abstract
Adherence and re-initiation remain persistent challenges, particularly in resource-constrained settings where access to personalised support is limited. Coach Mpilo is a WhatsApp-based AI chatbot developed to support HIV and TB wellness in South Africa. This study presents Indlela's methodological approach to usability testing of Coach Mpilo, applying behavioural science principles to iteratively refine its functionality, tone, and behavioural features. Methods: A mixed-methods usability testing approach leveraging behavioural science principles was conducted across two iterative rounds in Gauteng and KwaZulu-Natal with recruitment through Indlela's B-Hub, community-based participant database designed to facilitate recruitment for behavioural and implementation research studies. Round 1 identified friction points pre-implementation through in-depth interviews (IDIs), task-based interactions with the chatbot and focus group discussions (FGDs). Round 2 tested refinements post-implementation and targeted behavioural features (reminders, nudges, video content). Both rounds integrated qualitative insights with quantitative metrics including the validated System Usability

Scale (SUS), Acceptability of Intervention Measure and Intervention Appropriateness Measure (AIM/IAM). Findings: Across two rounds of usability testing (n=30 in Round 1; n=57 in Round 2), the Coach Mpilo chatbot demonstrated consistently high usability, acceptability, and appropriateness. Quantitative results showed stable, "excellent" SUS scores (Round 1: 86%; Round 2: 84.2%) and strong AIM and IAM scores (Round 1: 62-83% "Strongly Agree" across IAM/AIM items; Round 2: 93-100 % across IAM/AIM items). While quantitative measures confirmed strong usability and acceptability, qualitative methods identified nuanced user preferences around local language options, message length, privacy, and tone. A non-judgemental space was consistently reported as a key enabler of trust and engagement. Together, these findings demonstrate that community-informed, iterative design can meaningfully enhance both the technical and relational dimensions of AI health tools.

Submission 167

Machine learning and deep learning approaches to stock market prediction: Zimbabwe stock exchange (1994-2025)

Authors: Zibusiso Dube, Constantine Mupondo
Affiliation(s): National University of Science and Technology
Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure (Track 3, WSS 4)
Keywords: Stock price forecasting, Zimbabwe stock exchange, Financial econometrics, Convolutional Neural network, Arima, Random forest, LSTM, Time series analysis, Machine learning, Deep learning, Regime analysis
Presentation: Session 3.3; Thursday 25 June; 10:25–10:45; Track 3; Venue: WSS 4

Abstract

Stock price forecasting in emerging markets with histories of severe macroeconomic disruption presents a fundamentally different challenge to that encountered in developed or large emerging economies. This study provides the first systematic comparison of econometric and machine learning forecasting models applied to the Zimbabwe Stock Exchange (ZSE) across four distinct currency regimes spanning 1994 to 2025 namely: the Zimbabwe Dollar era, the USD dollarisation period, the RTGS/ZWL era, and the gold-backed ZiG regime, covering 7,997 daily observations across twenty listed equities. Using USD-converted closing prices as the primary analytical input, four forecasting models are evaluated: the Autoregressive Integrated Moving Average (ARIMA) model as the econometric baseline, and three machine and deep learning models, Random Forest (RF), Long Short-Term Memory (LSTM) networks, and one-dimensional Convolutional Neural Networks (CNN). Model performance is assessed using a multi-dimensional framework encompassing Root Mean Square Error (RMSE), Mean Absolute Error (MAE), and Mean Absolute Percentage Error (MAPE) as descriptive accuracy metrics; the Diebold–Mariano test for formal pairwise forecast comparison; the Pesaran–Timmermann test for directional predictability; and a one-way ANOVA to test the effect of currency regime transitions on forecast loss. The ZSE's unique regime structure constitutes a natural experiment that allows model robustness to be evaluated under radically different macroeconomic environments, including hyperinflationary collapse, monetary stabilisation, and currency redenomination. Findings are expected to contribute empirical evidence on the relative merits of traditional and data-driven forecasting approaches in a structurally volatile African frontier market, extending the global ML/DL forecasting literature to a critically understudied yet analytically rich context.

Submission 171

One Province, Two Cities, Three Realities: What a New Urban Surveillance Platform Reveals About Household Vulnerability in Gauteng

Authors: Eulender Mbetse and Sikelela Madonsela
Affiliation(s): University of the Witwatersrand
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics (Track 2, WSS 2)
Keywords: urban surveillance, household vulnerability, HDSS, Gauteng, informal settlements, energy insecurity, climate exposure
Presentation: Session 3.3; Thursday 25 June; 10:25–10:45; Track 4; Venue: WSS 5

Abstract
Africa is urbanising at a pace that its data systems have not kept up with. We know the big; picture — cities are growing, informality is expanding, and millions of households are; navigating...

Submission 172

Advancing Fairness in Medical Imaging with CycleGAN-Based Synthetic Augmentation

Authors: Neville Modise, Pravesh Ranchod
Affiliation(s): School of Computer Science and Applied Mathematics; University of the Witwatersrand, Johannesburg, South Africa; Deep learning systems for melanoma detection have achieved remarkable diagnostic; particularly those with darker skin tones (Fitzpatrick types V-VI), exacerbating existing
Scientific theme: Theme 3: Health, Bioinformatics, Geospatial, Environmental, Climate, Agricultural, and Urban Analytics
Keywords: Keywords to be verified
Presentation: Session 5.1; Wednesday 24 June; 09:45–10:05; Track 5; Venue: WSS 3

Abstract
healthcare disparities. This paper presents a two-stage approach using Cycle-Consistent Generative Adversarial Networks (CycleGAN) to generate synthetic dark-skin melanoma images, and EfficientNet-B4 to classify melanoma lesions across diverse skin tones. Light-skin lesion images from the ISIC dataset were translated into dark-skin counterparts via unpaired image-to- image translation. Generated images were evaluated using the Structural Similarity Index Measure (SSIM = 0.72, on a scale of 0 to 1, indicating strong structural fidelity) and incorporated into a melanoma classification pipeline. Across four experimental configurations, synthetic augmentation improved accuracy (0.955 to 0.967), F1-score (0.895 to 0.952), and ROC AUC (0.988 to 0.994), with the most substantial gains in cross-domain testing on the Diverse Dermatology Images (DDI) dataset, which spans all six Fitzpatrick skin types. The findings demonstrate that GAN-based augmentation is a viable, scalable, and privacy-preserving strategy for bias mitigation in dermatology AI, offering a reproducible pathway to closing cross-domain performance gaps without requiring new clinical data collection.

Submission 176

Co-developing PAMHoYA Discovery: A South African Mental Health Data Discovery Framework Authors

Authors: Augustine Khumalo; Silas Formunyuy Verkijika; Trust Gangaidzo; Audrey Moyo; Lovemore Sigwadhi; Nataly; Woollett; Vundli Ramokolo; Angel Maredi; Linda Mazibuko; Jason Bantjes; Donnela Besada; David Everatt; Bettina Moltrecht; Innocent Maposa; Dashini Govindasamy

Affiliation(s): Division of Epidemiology; Health Sciences; Mental Health Alcohol Substance Use; Decision Science PRICELESS SA, A Division of Wits Health; Africa; Conference track: Applied Data Science in Health, Finance, Climate, Energy, etc

Scientific theme: Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations

Keywords: Discovery, NLP, Multilingual

Presentation: Session 2.4; Wednesday 24 June; 12:20–12:40; Track 4; Venue: WSS 5

Abstract

Mental health is a major and growing public health challenge, particularly among adolescents and young people who represent a large proportion of the population in many low- and middle-income countries, including South Africa. Poor mental health during this developmental stage has long-term life-course consequences, yet policy and service planning are constrained by fragmented, small-scale, and difficult-to-reuse data. PAMHoYA aims to improve access to, integration of, and reuse of South African mental health data by developing a discovery-focused platform to identify, organise, and harmonise metadata from mental health datasets. We developed the PAMHoYA Discovery prototype as an applied data science platform to improve the identification and reuse of South African mental health datasets, following the Design Science Research (DSR) framework. To support dataset discovery and metadata harmonisation, natural language processing (NLP) was used to standardise and compare free-text metadata fields, including titles, descriptions, constructs, and instrument labels. The workflow used multilingual transformer-based embeddings to capture semantic similarity across metadata, including cross-language questionnaire matching, with multiple models evaluated for stability and consistency. Preprocessing was limited to metadata cleaning and normalisation. The primary output was a structured discovery layer that enables users to search mental health datasets by source, geography, construct, instrument, and access pathway. Application of the NLP pipeline improved the semantic matching of mental health metadata by converting dataset and instrument descriptions into multilingual sentence embeddings across local languages and ranking candidate matches using cosine similarity. For the operational platform, the `sentence-transformers/paraphrase-multilingual-MiniLM-L12-v2` was selected as the default model. For item-level local-to-English mappings, AfroXLMR showed the highest and most consistent similarity ($\approx$0.84–0.90) across mental health instruments (e.g., PHQ-9, GAD-7, CES-D-10), followed by mE5-Large, while other models declined in lower-resource languages and MPNet performed poorly. Within PAMHoYA, similarity-based outputs are used to support discovery and metadata harmonisation by returning ranked matches and mean cosine similarity scores. These results indicate that the NLP approach is useful for multilingual metadata retrieval, although full task-specific validation using SAPRIN and NIDS datasets remains ongoing. PAMHoYA Discovery provides a scalable, NLP-enhanced metadata harmonisation framework to facilitate the discovery and reuse of mental health datasets in South Africa, addressing critical barriers in data fragmentation and interoperability. Future work will focus on full task-specific validation and platform expansion to additional low- and middle-income country contexts.

Submission 177

Quantifying Popularity Bias and User-Centric Fairness in Recommender Systems: A Cross-Domain Empirical Study

Authors: Cebo Mkhwanazi, Mandlenkosi V. Gwetu, Sunday O. Oladejo
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Scientific theme: Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations (Track 1, WSS 1)
Keywords: Recommender Systems, Popularity Bias, Collab-; orative Filtering, Content-Based Filtering, Fairness, User-Centric; Evaluation, Empirical Evaluation
Presentation: Session 2.4; Wednesday 24 June; 12:20–12:40; Track 1; Venue: WSS 1

Abstract
Recommender systems frequently suffer from popularity and exposure biases, leading to a concentration of recommendations on a small subset of mainstream items and disparate accuracy across user groups. This empirical study focuses on two complementary views: macro-level exposure inequality (how often items appear in top-K recommendations) and user-centric fairness (whether users with niche tastes pay a "niche tax" in RMSE or NDCG@10 relative to mainstream users). Six recommendation architectures (collaborative filtering: SVD, ALS, k-NN; content-based filtering: TF-IDF, logistic regression; and a hybrid/ID-based random forest) were evaluated on three public benchmarks (MovieLens 1M, Last.fm 2K, Book-Crossing) and one e-commerce review corpus (Takealot). Matrix factorization models (ALS, SVD) behave as strong popularity amplifiers, with extreme Gini coefficients (e.g., $\sim$0.9998 for ALS on Takealot) and very low catalog coverage, while content-based models spread exposure more evenly but often achieve weaker ranking accuracy in sparse settings. User-centric analysis shows a consistent accuracy gap for niche users under neighborhood-based models (k-NN), with dataset- and model-dependent signs for ΔRMSE. We argue that deployment decisions should audit both aggregate exposure metrics and segment-level accuracy, using ranking-oriented metrics when content models lack calibrated rating heads. A companion manuscript studies simulated feedback loops and retraining dynamics separately.

Submission 178

Simulated Feedback Loops in Recommender Systems: Diversity, Popularity, and Content vs.

Authors: Collaborative Retraining; Cebo Mkhwanazi, Mandlenkosi V. Gwetu, Sunday O. Oladejo
Affiliation(s): Department of Industrial Engineering, Faculty of Engineering, Stellenbosch University
Scientific theme: Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations (Track 1, WSS 1)
Keywords: Recommender Systems, Feedback Loops, Pop-; ularity Bias, Diversity, Simulation, Collaborative Filtering,; Content-Based Filtering, Exposure Bias
Presentation: Session 2.5; Wednesday 24 June; 12:40–13:00; Track 1; Venue: WSS 1

Abstract
When recommendations drive new clicks and logged data are fed back into training, recommender systems can enter feedback loops that amplify popularity bias and reduce catalog diversity, or, under

some models, partially mitigate those effects. This paper reports a five-round simulation in which top-K recommendations stochastically generate new interactions according to a relevance–popularity click model, followed by retraining. We compare a collaborative filter (SVD) against a content-based model (TF-IDF) on the same cross-domain benchmarks used in a companion study: MovieLens 1M, Last.fm 2K, Book-Crossing, and Takealot. The results show that "diversity decay" is not universal: SVD can increase average recommended popularity (ARP) and reduce aggregate diversity (e.g., ML-1M ARP 893→1997 in our run), while TF-IDF can maintain or increase diversity on several datasets, suggesting that content signals can temper pure collaborative feedback dynamics. These findings motivate auditing not only static recommendation lists but also the trajectory of diversity and popularity under repeated deployment. Tracking these dynamic trajectories is a vital step toward developing robust bias mitigation strategies that function effectively in real-world, sequential environments.

Submission 179

Analysing the African Air Transport Network Structure

Authors: Stefan Britz; Sebnem Er; David Snaddon
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Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics (Track 2, WSS 2)
Keywords: African Air Transport Network, Network Analysis, Small-world networks
Presentation: Session 3.2; Thursday 25 June; 10:05–10:25; Track 2; Venue: WSS 2

Abstract

The African Air Transport Network (AATN) plays a critical role in enabling connectivity across a geographically diverse and infrastructurally fragmented continent. This study analyses the AATN topology using scheduled passenger route data for 2025, with the aim of characterising the network's structure and identifying key airports and routes. While similar research exists for major air transport networks in other regions, this is the first analysis of African air transport routes. Standard network analysis measures and techniques – such as the degree distribution, centrality measures, community detection, and K-core decomposition – are applied to the route network, which is weighted by seat capacity. The degree distribution is heavy-tailed, consistent with a hub-and-spoke structure in which a small number of airports dominate connectivity. Centrality measures identify key hubs, notably Addis Ababa, and high-capacity routes such as the Johannesburg-Cape Town-Durban corridor as dominant components of the network. Community detection via the Louvain algorithm reveals clusters that broadly align with African subregions, whilst K-core decomposition identifies a densely interconnected core distributed across the continent, with notable concentration in West Africa. The network exhibits small-world characteristics, with relatively high clustering and short path lengths alongside reliance on major hubs. These results provide a basis for subsequent analysis of the AATN evolution and resilience.

Submission 180

Turning Routine Health Data into Decision Intelligence: Automating the District Health Barometer (DHB)

Authors: Ntombifuthi Blose; Matome Mokganya; Emanuel Dominic; Noluthando Ndlovu
Affiliation(s): Health Systems Trust
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics (Track 2, WSS 2)

Keywords: District Health Barometer, Data pipeline automation, Health systems intelligence, Cloud-based analytics
Presentation: Session 2.5; Wednesday 24 June; 12:40–13:00; Track 2; Venue: WSS 2

Abstract
The District Health Barometer (DHB) is a national benchmarking tool used to track health system performance across South Africa's 52 districts. However, producing the DHB has historically been a highly manual and time-consuming process. It relied on pulling data from multiple sources (DHIS, BAS, and PERSAL), followed by extensive spreadsheet-based cleaning, merging, and alignment. Tasks such as fuzzy matching are done manually in Excel and can take weeks, create delays and increasing the risk of human error. To address this, we reworked the entire process into a cloud-based, automated data pipeline. Using Python, Docker, and Google Cloud Platform, we built a system that continuously ingests DHIS data via API, while finance and HR datasets are automatically cleaned, merged, and standardised using reproducible workflows. Fuzzy matching, which was previously manual, is now handled programmatically, making the process much faster and more consistent. All datasets are stored and combined in BigQuery, where they form a single, unified data layer that feeds both the annual DHB publication and an interactive dashboard. This setup allows for near real-time updates, built-in validation, and the flexibility to scale across indicators and districts without reworking the system. The impact has been significant. Processes that used to take weeks are now completed in minutes, with far less manual intervention and improved data quality. More importantly, this work shifts the DHB from a static reporting exercise to a more dynamic decision-support tool. Overall, this project shows how practical data science, through automation, cloud tools, and good data engineering, can strengthen routine health information systems. By embedding these approaches into existing workflows, we move from delayed reporting to more timely, data-driven decision-making, while also creating a foundation for more advanced analytics in the future.

Submission 185

1beat: Revolutionising Clinical Data Management in Resource-Limited Settings – A Public Sector Hospital Case Study

Authors: Rozett Phillips, Ziyaad Dangor, Jerome Loveland and Kendal Makgamathe
Affiliation(s): GIBS Business School
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics (Track 2, WSS 2)
Keywords: Clinical Workflow, Azure Cloud, Digital Health Data, Dignity by Design, Electronic Medical Record, FHIR Standard, Mobile-first solutions, Public Sector, Resource-Limited Settings
Presentation: Session 3.3; Thursday 25 June; 10:25–10:45; Track 2; Venue: WSS 2

Abstract
African healthcare faces a "data vacuum." While Africa carries 25% of the global disease burden, it contributes less than 2% of the data used to train medical AI. This 98% exclusion creates a clinical blind spot, leaving diagnostic tools and therapeutic modalities unrepresentative of African ancestry. Conventional proprietary Electronic Medical Record systems remain too costly and rigid to bridge this gap. First implemented at Chris Hani Baragwanath Academic Hospital (BARA), 1beat is a mobile-first, Azure cloud-based clinician-led digital record software application and system purpose-built for limited resource settings like the South African public health sector. Developed through a public-private academic partnership between the University of the Witwatersrand, Surgeons for Little Lives, Business Science Corporation and Private Sector Sponsors, it utilises Google Remote Procedure Calls (gRPC) to ensure high performance on low-bandwidth networks at one-third the cost of proprietary systems.

A backend utilising Fast Healthcare Interoperability Resources standards (FHIR) ensures high-fidelity data is research-ready and globally compatible, while bedside-developed workflows ensure the system mirrors actual patient care. Since 2023, 1beat has been deployed across pediatric surgery units at BARA, Charlotte Maxeke Academic and Nelson Mandela Children's Hospitals as well as Paediatrics and Neonatology at Bara. It has created 40,000 new patient records and digitised 30,000 admission and treatment data. Clinical Insight and Public Health Impact- Identified a 20% mortality rate in paediatric hot water burns, triggering resource reprioritisation and public health awareness campaign alerts. Efficiency- Automated lab integrations and digital handovers save clinicians an estimated 10,000 hours annually. Coordination- 90% of staff report improved team synchronisation. With a vision to roll-out this solution to as many Public Sector Paediatrics, Neonatology and Paediatrics Surgery units as possible in South Africa and beyond, 1beat represents a moonshot to end data poverty in the Global South. It demonstrates that sovereign African health intelligence is possible. It moves beyond "data poverty" to build cost-effective foundational digital infrastructure and software that makes African health data research-ready, globally compatible, and most importantly, clinically representative of the continent's children allowing healthcare professionals to save more lives.

Submission 191

Normalising Flow Enhanced GARCH Models: A Two-Stage Framework for Flexible Innovation Modelling in Financial Time Series

Authors: Abdullah Hassan; Farai Mlambo; Wilson Tsakane Mongwe

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Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure (Track 3, WSS 4)

Keywords: Normalising flows; GARCH; volatility forecasting; financial time series; heavy tails; financial econometrics; innovation distributions

Presentation: Session 4.1; Thursday 25 June; 11:20–11:40; Track 3; Venue: WSS 4

Abstract

We introduce the Normalising Flow GARCH (NF-GARCH), a two-stage hybrid framework that enhances traditional GARCH models by replacing restrictive parametric innovation distributions with learned densities via normalising flows. The approach preserves the interpretability of standard variance dynamics while addressing the common issue of innovation misspecification. In the first stage, standard GARCH variants, including sGARCH, TGARCH, and gjrGARCH, are estimated to extract standardised residuals. In the second stage, a Masked Autoregressive Flow learns the underlying residual distribution, with samples from the flow subsequently driving the GARCH recursion for out-of-sample forecasting. Evaluated on 13 daily financial series, comprising six foreign exchange pairs and seven equities, NF-GARCH demonstrates systematic and statistically significant improvements in forecast accuracy for skewed-t baselines. Wilcoxon signed-rank tests confirm superior performance specifically for gjrGARCH-sstd and sGARCH-sstd specifications. While the framework offers enhanced flexibility and generative realism, computational overhead is increased, and the log-variance specification of eGARCH exhibits instability when paired with flow-based innovations. The results suggest that NF-GARCH effectively captures empirical tail behaviour in univariate settings, while future research should explore conditional flow architectures and multivariate extensions to account for time-varying innovation shapes. For risk management, the gains are most relevant where skewed-t baselines are used and where closer residual realism supports scenario analysis, although effect sizes remain modest relative to model risk and implementation cost.

Submission 195

Parametric Data Loading: A Zero-Shot Transfer Learning Framework for Sparse Retail Time Series in Emerging Markets

Authors: Tawonga Chikovore
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Scientific theme: Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations (Track 1, WSS 1)
Keywords: transfer learning, synthetic domain adaptation,; retail forecasting, emerging markets, sparse time series, South; Africa, infrastructure friction, dual economy, zero-shot learning,; LightGBM
Presentation: Session 2.2; Wednesday 24 June; 11:40–12:00; Track 1; Venue: WSS 1

Abstract

The contemporary retail landscape of the Global South, with South Africa serving as a primary archetype, operates as a complex “Frontier Market” that fundamentally challenges the statistical assumptions inherent to Western-centric forecasting models. Emerging markets suffer from an ecosystem defined by sparse, incomplete retail data that is routinely compromised by infrastructure friction, severe socioeconomic volatility, and increasingly strict privacy legislation. These factors render modern predictive modelling exceptionally difficult and computationally unreliable. This research introduces Parametric Data Loading (PDL), a novel Synthetic Domain Adaptation (SDA) framework designed to circumvent the chronic scarcity of local data. The PDL methodology physically mutates data-rich source environments (such as high-frequency United States grocery data) using domainspecific mathematical parameters. By explicitly programming contextual variables—including seasonal phase inversion, dualeconomy liquidity pulses, continuous infrastructure friction, and deterministic macro-crises—the framework produces highprecision synthetic representations of the target environment. Empirical evaluation demonstrates statistically significant macro-level predictive improvement (+5.136%, $p = 0.007$) and cross-domain equivalency with native emerging-market data ($p = 0.908$), establishing PDL as a viable zero-shot synthetic domain adaptation instrument for AI-driven retail forecasting in resource-constrained frontier markets. Attempts to reconcile this macroeconomic success down to the atomic item level highlight current boundaries in static historical disaggregation, setting the stage for future research into dynamic, machine-learned reconciliation and Spatial-Temporal Graph Neural Networks.

Submission 203

Contextual mapping of the Wits AI policy development and training environment: Challenges and opportunities

Authors: Marike Kluyts, Caryn Mcnamara, Tanya Coetzee and Eleni Flack-Davison
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Scientific theme: Theme 4: Research Data Management, Open Data, Institutional Analytics, and Educational AI (Track 4, WSS 5)
Keywords: Arima, Random forest, LSTM, Time series analysis, Machine learning, Deep learning, Regime analysis
Presentation: Session 2.3; Wednesday 24 June; 12:00–12:20; Track 4; Venue: WSS 5

Abstract
Artificial Intelligence (AI) presents both opportunities and complex risks for higher education, reshaping practices of teaching, learning, and research while raising ethical, compliance, and governance concerns. Globally, universities are developing institutional AI governance structures to counteract the possible risks. Within the South African context, there is also developments at national level with policy directions that emphasise human-centred, ethical, and contextually responsive AI implementation. With this backdrop, the University of the Witwatersrand, Johannesburg (Wits) developed an AI framework that is operationalised through faculty-level guidelines, allowing for discipline-specific variations. However, the need for such differentiation introduces potential misalignments between centralised policy intentions and faculty-level implementation. This paper presents a contextual mapping of the development and interpretation of a Wits' publicly available AI Framework, alongside its translation into faculty-specific Guidelines. Drawing on qualitative document analysis the study employs a comparative framework to examine areas of alignment and divergence across institutional and faculty-level documents. This is complemented by a thematic analysis of how AI is framed within different disciplinary contexts, with attention to emerging tensions between institutional standardisation and disciplinary specificity. Preliminary findings indicate that while the Framework establishes a coherent set of principles related to ethical AI use, academic integrity, and responsible innovation, faculty-level Guidelines variably interpret and operationalise these principles. Differences emerge in how AI is positioned as well as in assumptions about authorship, learning, and acceptable use at all academic levels within the research ecosystem. These variations reflect underlying disciplinary epistemologies and priorities, highlighting the challenges of achieving policy coherence in a complex academic environment. The paper contributes to ongoing discussions on AI governance in higher education by demonstrating how institutional frameworks are negotiated in practice, and by identifying key tensions that shape their implementation. It offers insights for the development of more responsive and context-sensitive AI governance strategies that balance institutional coherence with disciplinary autonomy.

Submission 210

A Game-Theoretic Framework for Uplift Maximization in Two-Sided Marketplace Recommender Systems

Authors: Sunday Oladejo
Affiliation(s): Stellenbosch University
Scientific theme: Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations (Track 1, WSS 1)
Keywords: Two-sided marketplace, Game-theoretic, Bilevel optimization, Fairness-aware, Metaheuristics, Recommender System
Presentation: Session 3.1; Thursday 25 June; 09:45–10:05; Track 1; Venue: WSS 1

Abstract
This work addresses the problem of policy optimisation in a game-theoretic two-sided marketplace recommender system, where a platform must jointly determine ranking and subsidy decisions under stochastic demand, strategic provider responses, and operational fairness constraints. The key challenge lies in maximising platform uplift while accounting for provider competition, user heterogeneity, capacity limits, distance effects, and user-level disparity. To address this, we develop a bilevel framework in which user demand is modelled through a logit-based random utility formulation and provider discounts are determined endogenously via Nash equilibrium. The resulting non-convex, equilibrium-embedded problem is solved using Genetic Algorithms and Particle Swarm Optimisation. The main contribution is a structurally grounded optimisation framework that integrates game-theoretic provider behaviour, marketplace recommendation, and fairness-aware platform policy design.

Submission 211

Integrating Alternative Data and Machine Learning for Financial Forecasting: Evidence from South African REITs

Authors: Vukani Majozi
Affiliation(s): University of the Witwatersrand
Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure (Track 3, WSS 4)
Keywords: Alternative Data, Google Trends, Return Forecasting, Machine Learning, REITs
Presentation: Session 4.2; Thursday 25 June; 11:40–12:00; Track 3; Venue: WSS 4

Abstract

Forecasting Real Estate Investment Trust (REIT) returns remains a challenge, particularly in emerging markets where traditional financial indicators may not fully capture market dynamics. This study investigates whether alternative data, specifically Google Trends search activity, improves REIT return forecasting. Using a panel dataset of the top 10 South African REITs listed on the JSE Limited from 2016 to 2026, the analysis combines firm-level financial variables, macroeconomic controls, and lagged search intensity measures as proxies for investor attention. The study employs both panel econometric models and machine learning techniques, including Random Forest and XGBoost, to compare forecasting performance across models with and without alternative data inputs. Results indicate that incorporating Google Trends data significantly improves out-of-sample predictive accuracy, particularly for larger and more visible REITs. These findings highlight the importance of behavioural signals in real estate finance and demonstrate the value of integrating alternative data into forecasting frameworks. The study contributes to the growing literature on data-driven investment strategies and provides practical insights for investors, asset managers, and policymakers in emerging REIT markets.

Submission 214

Mapping Dispute Drivers in Public Infrastructure Projects: A Machine Learning Analysis of Uganda's Auditor General Reports from 2017 to 2025

Authors: Charles Gavamukulya, Aurobindo Ogra, Clinton Aigbavboa
Affiliation(s): University of Johannesburg
Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure
Keywords: text mining, auditor general reports, construction disputes, natural language processing, support vector machines, factor analysis
Presentation: Session 4.1; Thursday 25 June; 11:20–11:40; Track 4; Venue: WSS 5

Abstract

This study investigates the drivers of infrastructure disputes in Uganda's public infrastructure sector by employing text mining techniques on reports from the Office of the Auditor General (OAG) covering the financial years 2017/2018 to 2024/2025. Despite the comprehensive audit oversight provided by the OAG, the sector continues to face persistent cost overruns and disputes. Existing research in Uganda predominantly relies on project-specific case studies and subjective surveys, which are susceptible to cognitive bias and lack the scalability needed for analyzing large volumes of audit data. As a result, audit reports remain underutilized as tools for proactive risk management.

To bridge this gap, the study develops a text mining framework to extract, classify, and analyze systemic dispute drivers from OAG reports over an eight-year period. Natural language processing techniques, including Support Vector Machines (SVM), Factor Analysis (FA), and Hierarchical Topic Modelling, are applied to a corpus of 1,233 infrastructure-related sentences from 72 sub-audit reports. Text representation is achieved using Term Frequency–Inverse Document Frequency (TF-IDF), with SVM classification benchmarked against alternative classification methods. The SVM model demonstrates strong predictive performance, achieving 91.86% accuracy and an F1-score of 91.45%. A 13-category dispute driver taxonomy is developed, revealing that administrative inefficiencies, procurement irregularities, and delays account for over 60% of disputes. Network analysis of key actors further identifies fragmented governance structures, with statutory bodies as dominant actors and planning units as high-risk nodes. The findings indicate that disputes are primarily driven by systemic governance failures rather than isolated project factors. The study repositions audit reports as scalable sources of dispute intelligence, supporting predictive risk monitoring and targeted institutional reform.

Submission 219

Predicting M&A Success: A Machine Learning Approach

Authors: Lerato Mapela; Chimwemwe Chipeta; Moinak Maiti
Affiliation(s): University of the Witwatersrand
Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure (Track 3, WSS 4)
Keywords: Mergers and Acquisitions, Machine Learning, Classification Models, Predictive Modelling.
Presentation: Session 3.2; Thursday 25 June; 10:05–10:25; Track 3; Venue: WSS 4

Abstract
The study examines the prediction of mergers and acquisitions (M&A) success using a data-driven approach, addressing the persistent challenge of accurately forecasting deal outcomes. Despite extensive empirical research, existing models often produce inconsistent results, particularly in emerging markets where institutional and informational constraints are more pronounced. The paper develops a predictive framework that integrates firm-specific, deal-specific, and macroeconomic variables within a machine learning setting. Classification algorithms are employed to model the probability of M&A success, allowing for the identification of key predictors and the evaluation of model performance relative to traditional approaches. The analysis draws on a sample of South African M&A transactions, providing a unique context to assess how predictive models perform in an emerging market environment. The study emphasises both predictive accuracy and interpretability, contributing to the growing literature that combines finance with data science techniques. The findings are expected to offer practical insights for investors, corporate managers, and policymakers by improving the ability to assess the likelihood of successful acquisitions, while also advancing methodological approaches to M&A outcome prediction.

Submission 220

Causally Scaffolded Deep Learning for Sequential Clinical Decision Support in Sub-Saharan Africa

Authors: Albert Whata
Affiliation(s): University of Pretoria, South Africa

Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Keywords: Deep learning; causal inference; LSTM; Temporal Convolutional Network; Transformer; inverse probability weighting; doubly robust estimation; dynamic treatment regimes; agentic AI; HIV; sepsis; African health systems
Presentation: Session 4.1; Thursday 25 June; 11:20–11:40; Track 2; Venue: WSS 2

Abstract

Every day, clinicians across sub-Saharan Africa face hundreds of treatment decisions under conditions of limited resources, incomplete patient information, and insufficient staffing. Artificial intelligence systems trained on historical health records could meaningfully support these decisions. However, training such systems on observational data introduces a serious challenge: because sicker patients historically received more aggressive treatment, a naively trained model may learn to associate aggressive treatment with poor outcomes and may therefore recommend withholding it. If uncorrected, this confounding bias can make AI guidance potentially harmful rather than helpful. This paper proposes the Causally Scaffolded Deep Learning (CS-DL) framework to address this challenge. The framework combines three components. First, it uses deep sequence models, including LSTM networks, Temporal Convolutional Networks, and causally masked Transformers, to capture how patient health evolves over time. Second, it applies causal inference methods, specifically inverse probability of treatment weighting and doubly robust estimation, to correct for biases introduced by historical treatment decisions. Third, it uses a dynamic treatment regime architecture to translate corrected model outputs into concrete, updatable treatment recommendations. The framework will be evaluated in two settings: HIV treatment adherence support and sepsis management in a South African intensive care unit. The study expects the CS-DL framework to improve patient outcomes relative to historical clinical practice in both settings. It also anticipates that standard deep learning models without causal correction may perform worse as model complexity increases, highlighting the importance of integrating causal reasoning into clinical AI systems for African health contexts.

Submission 225

Open Neuroinformatics Platforms and Data Governance Ecosystems in Africa: Towards Equitable, Ethical, and Sustainable Brain Data Science

Authors: Thamsanqa Hombana
Affiliation(s): University of the Witwatersrand, Johannesburg, South Africa

Scientific theme: Theme 4: Research Data Management, Open Data, Institutional Analytics, and Educational AI (Track 4, WSS 5)
Keywords: neuroinformatics; data governance; open science; FAIR data; Africa; Ubuntu ethics;; capacity building; brain data; POPIA; federated data models
Presentation: Session 2.2; Wednesday 24 June; 11:40–12:00; Track 4; Venue: WSS 5

Abstract

Introduction: The emergence of neuroinformatics as a data-intensive discipline presents significant opportunities for advancing brain science in Africa. However, the continent remains critically underrepresented in global neuroscience datasets, and existing data governance frameworks inadequately address African socio-cultural, ethical, and infrastructural realities. This article reviews the current landscape of open neuroinformatics platforms and data governance ecosystems in Africa, identifying systemic gaps and proposing contextually tailored frameworks. Materials and Methods: A structured narrative review was conducted, synthesising peer-reviewed literature, grey literature, and policy documents sourced from Scopus and related academic databases. Thematic analysis was applied across the domains of open science governance, FAIR data principles, capacity building,

ethical frameworks, and federated data architectures within the African neuroinformatics context. Results: Findings reveal a fragmented governance landscape marked by tensions between open science imperatives and data protection legislation, such as South Africa's POPIA. African brain data suffers from limited Findability, Accessibility, Interoperability, and Reusability (FAIR), compounded by infrastructure deficits and insufficient training capacity. Existing platforms such as Brain-CODE and G-Node offer transferable models, but their adoption requires adaptation to African communal consent philosophies grounded in Ubuntu ethics. Federated and decentralised governance architectures are identified as viable pathways for balancing data sovereignty with cross-border collaboration. Discussion and Conclusions: Building sustainable neuroinformatics ecosystems in Africa demands a multipronged strategy integrating open science advocacy, human-centric data governance, capacity development, and culturally inclusive ethical frameworks. Policy alignment at the continental level, guided by the African Union's data governance frameworks, is essential. This study contributes a contextually grounded roadmap for equitable and ethical brain data science across Africa.

Submission 70

From Access to Burden: A Diagnostic Framework for Trust in Service Delivery Systems

Authors: Kabiri Bule
Affiliation(s): University of the Witwatersrand, Johannesburg
Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure (Track 3, WSS 4)
Keywords: Governance, Trust, Service delivery, Diagnostic analytics, Urban systems, South Africa, Policy analytics
Presentation: Session 1.3; Wednesday 24 June; 10:25–10:45; Track 3; Venue: WSS 4

Abstract

Access to basic services is often treated as evidence of effective governance. In practice, that conclusion is premature. Services may be present, yet still be experienced as unreliable, costly, frustrating, or difficult to navigate. This paper starts from that simple problem: systems can look functional on paper while being lived very differently on the ground. I have developed a four-signal diagnostic framework that separates governance into access, experience, burden, and trust. Using Gauteng City-Region Observatory Quality of Life Survey 7 (2023/24) data, I construct interpretable indices for each signal and examine how they align across households. The results show a clear misalignment. Access is generally high, but trust remains low. Configuration analysis further shows that many households are located in high-access conditions marked by high burden and low trust, a pattern the paper describes as burdensome presence. Regression results show that burden is the strongest predictor of trust, stronger than both access and disruption, and robust to demographic controls. The paper makes two contributions. Methodologically, it shows the value of moving from single indicators to structured, multi-signal diagnostics and from averages to configuration-based analysis. Substantively, it shows that governance legitimacy cannot be inferred from provision alone; it is also shaped by the cost, pressure, and administrative terms through which services are encountered in everyday life.

Submission 111

A Comparative Evaluation of Sequential and Tree-Based Machine Learning Models for Anti-Money Laundering Detection Using the SAML-D Synthetic Dataset

Authors: Humbulani Colbert Nekhumbe; Rimer Suvendi; Mpho Gift Gololo
Affiliation(s): Department of Electrical and Electronic Engineering Science; University of Johannesburg; Johannesburg, South Africa; 2nd; 3rd
Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure (Track 3, WSS 4)
Keywords: Anti-Money Laundering; Machine Learning;; Sequential Modelling; Gated Recurrent Unit; XGBoost; Decision; Tree; SAML-D; Class Imbalance; Transaction Monitoring
Presentation: Session 2.5; Wednesday 24 June; 12:40–13:00; Track 3; Venue: WSS 4

Abstract
Anti-money laundering (AML) monitoring increasingly requires models that can detect suspicious behaviour under severe class imbalance while preserving the temporal structure of financial activity. This paper presents a comparative modelling study using the SAML-D synthetic AML dataset. Two transaction-level tree-based models, a Decision Tree and XGBoost, are compared with an account-level Gated Recurrent Unit (GRU) model that learns from ordered receiver-account transaction histories. The methodology documents the original SAML-D fields and the engineered temporal, currency, amountchange, and account-behaviour features used in the modelling pipelines. Tree-based models are trained on static transactionlevel feature vectors using undersampling and cost-sensitive learning, while the GRU model is trained on padded accountlevel sequences with masking, robust scaling, one-hot encoding, account-level sampling, and validation-based threshold selection. Results show that XGBoost improves on the Decision Tree in ROC-AUC, but both tree-based models remain weaker on the laundering class. The GRU model achieves the strongest suspicious-account detection, with ROC-AUC of 0.987, precision of 0.90, recall of 0.88, and F1-score of 0.89. The findings support the use of sequential account-level modelling when laundering behaviour is expressed through transaction histories rather than isolated records.

Submission 120

Whose IP is it anyway? An ethical look at prompt engineering in algorithm development.

Authors: Taariq Surtee
Affiliation(s): University of the Witwatersrand, Johannesburg
Scientific theme: Theme 4: Research Data Management, Open Data, Institutional Analytics, and Educational AI
Keywords: Artificial Intelligence (AI) in Data Science, Prompt Engineering, Ethical AI Use, Research Integrity, AI Hallucination, Intellectual Property, AI-Assisted Research, Responsible AI, Knowledge Generation, Productivity vs Creativity, AI Accessibility, Pracademic Research
Presentation: Session 3.2; Thursday 25 June; 10:05–10:25; Track 4; Venue: WSS 5

Abstract
Artificial Intelligence (AI) is arguably one of the most disruptive technologies to date, impacting almost every aspect of modern life from assisting with mundane administrative tasks to complex calculations. It is accessible worldwide and can translate into almost any language, interpreting and developing audio, images and video. In research, depending on how users interact with AI, it can extract and optimise code, convert code into another language, develop new code, and, based on user prompts, offer ideas to increase productivity. However, it can also give researchers ideas they have not thought of, and therein lies the problem we discuss in this presentation. This presentation takes a pracademic approach, intending to enhance our understanding of the use of Artificial Intelligence in Data Science. Focusing on how users prompt Large Language Models and suggest ethical and

responsible acknowledgement of AI use in research. The outcome presents an innovative application that reaches beyond a current model built in Microsoft Excel. The journey takes the audience from simple prompts used to extract the algorithm to prompts that ask for AI-generated ideas. Throughout the journey, the AI outputs are reviewed for novelty, and the presenter poses ethical questions to the audience that researchers who intend to use AI should consider when publishing. Along the way, subtopics such as AI assumption and hallucination, productivity vs idea generation and creation, and AI (version) accessibility are also examined. The journey concludes with a deeper understanding of the varying degrees of ownership of intellectual property developed using AI.

Submission 143

Staff Capacity and the Utilisation of Information Systems for Evidence-Based Decision Making in Tanzania's Public Sector

Authors: Bahati Ilembo
Affiliation(s): Mzumbe University
Scientific theme: Theme 4: Research Data Management, Open Data, Institutional Analytics, and Educational AI (Track 4, WSS 5)
Keywords: digital literacy, public sector, staff capacity,; information systems
Presentation: Session 1.3; Wednesday 24 June; 10:25–10:45; Track 4; Venue: WSS 5

Abstract

Strengthening data-driven decision-making remains a critical priority for public sector performance in any country, including Tanzania. This study examined staff capacity and the utilization of information systems for evidence-based decision making in the public sector. The findings reveal that the workforce is predominantly young, well-educated, and relatively early in their careers, with the majority possessing Bachelor's degrees and less than five years of work experience. While this profile suggests strong potential for digital adaptability, limited experience may constrain effective engagement with decision making processes. Results show that digital competency among staff is generally at a moderate level, with strong proficiency in basic tools such as spreadsheets and management information systems, but limited use of advanced tools, including statistical software, data visualization platforms, and database management systems. The relationship between working experience and digital literacy is found to be non-linear, with early-career employees demonstrating relatively strong competencies, while mid- and late-career groups exhibit inconsistencies and gaps, particularly in technical skills. Institutional and leadership factors play a critical role in shaping data use, with supportive leadership and enabling systems fostering a culture of evidence-based decision-making. However, capacity constraints are largely driven by structural barriers, including limited training opportunities, inadequate ICT infrastructure, and heavy workloads. Although training is generally perceived as relevant, gaps remain in its depth and practical applicability. Overall, the study concludes that while foundational digital skills exist, enhancing advanced, integrated competencies and addressing institutional constraints are essential for strengthening the effective use of information systems in evidence-based decision-making.

Submission 161

A Theoretical Framework for Smart Agriculture Systems Using AI and Data Science for Climate Resilience and adaptation for Smallholder Farmers in Zimbabwe

Authors: Leonard Shambira
Affiliation(s): Great Zimbabwe University
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics (Track 2, WSS 2)
Keywords: Smart Agriculture, Artificial Intelligence, Data Science, Small Holder Farmers
Presentation: Session 3.1; Thursday 25 June; 09:45–10:05; Track 2; Venue: WSS 2

Abstract

Abstract Smallholder farming is the backbone of rural livelihoods and food security in Zimbabwe, yet climate change poses great challenges, where erratic rainfall, rising temperatures and land degradation undermine agricultural productivity. This framework is grounded in the systems-thinking approach which combine climate data analytics, machine learning models, Internet of Things (IoT) sensors and indigenous knowledge systems to support adaptive decision-making. The framework emphasizes the need for real-time data collection, predictive modelling for weather and crop performance as well as appropriate advisory services appropriate for local agro-ecological conditions. This study proposes a framework for Smart Agriculture Systems that are anchored in Artificial Intelligence (AI) and Data Science to enhance climate resilience and adaptation among smallholder farmers. The framework integrates data-driven technologies to enhance informed and appropriate decision making. The framework is structured around components that include climate data acquisition, predictive analytics, decision support systems and adaptive farm management practices. The framework emphasizes the adoption of AI models to forecast weather patterns, optimize planting schedules, monitor crop health and improve resource usage. The framework also incorporates socio-economic, institutional and infrastructural dimensions that have an influence on the adoption and scalability of smart agriculture technologies in rural settings. The study aims to strengthen farmers' capacity to anticipate, respond to and recover from climate related shocks. The study has a major contribution to the advancement of climate-smart agriculture by developing a scalable and appropriate framework that has the potential to support sustainable food systems, enhances resilience and promoting adaptive agricultural systems in Zimbabwe.

Submission 162

Developing an Explainable and Responsible AI-Based Credit Scoring Framework for Financial Inclusion in Zimbabwe

Authors: Leonard Shambira
Affiliation(s): Great Zimbabwe University
Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure (Track 3, WSS 4)
Keywords: Explainable, AI Credit Scoring, Financial Inclusion, Machine Learning
Presentation: Session 3.1; Thursday 25 June; 09:45–10:05; Track 3; Venue: WSS 4

Abstract

Abstract Financial inclusion is a challenge in Zimbabwe because the majority of the population operate in the informal sector, are smallholder farmers, operate micro-enterprises and are in the low-income bracket which limits their access to formal credit. Traditional credit scoring systems, rely on formal banking histories, collateral and stable income documentation. These systems exclude economically active but data invisible populations operating in the informal sector. Artificial intelligence (AI) driven credit scoring models have the mechanisms to expand access to finance through the use of alternative data sources. The adoption of AI models in fragile and unequal socio-economic contexts face challenges on opacity, algorithmic bias and fairness, accountability and consumer protection. This study incorporates an explainable and responsible AI based credit scoring model for the Zimbabwean financial inclusion landscape. The rational is that while AI offers substantial

potential in improving credit risk assessment for financially underserved populations, its legitimacy and sustainability depend on the integration of explainability and ethical safeguards into model design and deployment. The research explores the use of interpretable machine learning techniques and post hoc explanation methods such as logistic regression, decision trees, SHAP (Shapley Additive Explanations), and LIME (Local Interpretable Model-agnostic Explanations) to enhance transparency, justify lending decisions and detect discriminatory outcomes. The study argues that an explainable and responsible AI credit scoring framework has the potential to improve trust in digital lending systems, reduce exclusion errors and support equitable credit access to the underserved populations in Zimbabwe. The study contributes to the knowledge about the intersection of financial technology, ethical AI governance and inclusive development.

Submission 226

Understanding municipal concerns using Large Language Models and Spatial Analysis: Evidence from Integrated Development Planning e-participation data

Authors: Michelle Madiba
Affiliation(s): University of the Witwatersrand, South Africa
Scientific theme: Theme 4: Research Data Management, Open Data, Institutional Analytics, and Educational AI
Keywords: Large Language Models; Geospatial Analysis; Integrated Development Plan; E-participation; Interdisciplinary Data Science
Presentation: Session 3.1; Thursday 25 June; 09:45–10:05; Track 4; Venue: WSS 5

Abstract

Existing public participation mechanisms in South African local government decision-making are widely regarded as ineffective and symbolic, particularly in their influence on the Integrated Development Plan (IDP) priorities. The limited impact of public participation integration into the IDP has been found to contribute to the country's increasing violent public service-delivery protests. Although the adoption of e-participation for broader access to public participation has increased, resource and capacity constraint municipalities often rely on labour-intensive manual thematic analysis and tabular summaries of public inputs. These approaches inadequately translate public concerns into IDP priorities and frequently overlook location identifiers embedded in local government e-participation data. As a result, municipalities become unable to extract spatially contextual insights that can compare and measure public concerns across space for informed spatial planning within the IDP. This is an exploratory study that employs a mixed methods approach to propose a spatial methodological framework that integrates Large Language Models for sentiment analysis and topic modelling with geospatial analysis techniques to examine the spatial dependence of public concerns and sentiments. This framework aims to convert the geotagged, unstructured and qualitative e-participation data into quantitatively measurable and statistically meaningful location-based patterns of public concern and sentiment that enable spatial comparison that can meaningfully inform IDP priorities. The study area is the City of Johannesburg Metropolitan Municipality, and this research aims to demonstrate how statistically significant spatial patterns of public themes and sentiments can be extracted and assessed thereby highlighting the framework's potential to translate publicly defined IDP priorities using e-participation data. The findings contribute to democratic decision-making in South African local government by strengthening e-participation integration to IDP decision-making and improving citizen to government engagement.

Submission 187

Testing the Necessity of Rationality in Macroeconomic Dynamics through a Monte Carlo Comparison of Real Business Cycle Models and the Bak–Chen–Scheinkman–Woodford Self-Organized Criticality Framework

Authors: Lehlohonolo Moloi and Edward Nkadimeng
Affiliation(s): University of the Witwatersrand
Scientific theme: Theme 3: Business, Finance, Governance, Cybersecurity, and Digital Public Infrastructure
Keywords: Econophysics; Monte Carlo simulation; Rationality; RBC theory; BCSW model; Self-organized Criticality; Complex systems
Presentation: Session 4.2; Thursday 25 June; 11:40–12:00; Track 4; Venue: WSS 5

Abstract

This study investigates the role of agent rationality in generating macroeconomic fluctuations by comparing two computational frameworks, namely a rational-agent system inspired by Real Business Cycle (RBC) theory and a non-rational, interaction-driven system based on the Bak–Chen–Scheinkman–Woodford (BCSW) model. Using Monte Carlo simulation, the RBC model represents agents optimising behaviour under exogenous stochastic shocks, while the BCSW model consists of firms arranged on a lattice whose production dynamics are governed by local inventory thresholds and interactions. Time series of aggregate output are generated for both systems and analysed using statistical measures including distribution shape, volatility, and the frequency of extreme events. The RBC model produces stable, near-Gaussian fluctuations consistent with aggregation under the law of large numbers. In contrast, the BCSW model exhibits cascading production dynamics that generate fat-tailed distributions and large endogenous fluctuations without reliance on external shocks. These results demonstrate that key empirical features of economic systems can emerge from non-rational agent interactions structured through local rules. The findings support the econophysics perspective that macroeconomic complexity may arise from interaction-driven dynamics rather than fully rational decision-making, providing a robust framework for both modelling and pedagogy.

38. POSTER PRESENTATIONS

African Data Science Conference 2026

Poster contributions presented across the four ADSC 2026 scientific themes

Submission 197

Machine Learning Enhanced Surveillance of HIV–TB Co-infection Using Routine Tuberculosis Laboratory Data in Nigeria

Authors: Hassan Adam Murtala; Ibrahim Yusuf Ibrahim; Kasimu Mamuda; Aisha Adam Abdullahi; Dalhatu Abdullahi Aminu; Abubakar Muhammed Song; Yazeed Garba Bala; Abba Kasim Ibrahim; Mikhailu Suleman; Isiyaku Ahmadu; Muhammad Adamu Abbas; Abubakar Labaran Yusuf; Jordi B. Torrelles; Eknath Naik; Hamisu Mohammed Salihu

Affiliation(s): Kano Independent Research Centre Trust, Nigeria; National Institute of Public Health and Infectious Diseases, Nigeria; Kano State Center for Disease Control and Prevention, Nigeria; Kano State Ministry of Health, Nigeria; The Ohio State University, United States; University of South Florida, United States

Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics

Keywords: Tuberculosis; HIV; co-infection; machine learning; geospatial analysis; Nigeria; surveillance

Presentation: Hall: Poster Area, Date: Wednesday 24 June, Time: 16:00-17:00

Abstract

Background: HIV–TB co-infection acts as a synergistic and lethal combination that significantly increases mortality risk in high-burden settings, particularly within sub-Saharan Africa. However, limited data exist on the geospatial distribution and patient-level predictors of HIV–TB co-infection in Nigeria, constraining active surveillance and HIV–TB collaborative care. The study analysed laboratory records of 7,662 patients from a national TB reference laboratory register. Geospatial analysis, including state-level choropleth mapping, Global Moran's I, and LISA hotspot detection, covered 17 Nigerian states. Four machine learning algorithms—logistic regression, random forest, XGBoost, and support vector machine—were trained on ROSE-balanced data with 10-fold cross-validation to predict HIV co-infection. The modelling dataset included 4,592 patients, of whom 345 were HIV-positive. Performance was evaluated on an independent test set of 1,359 patients, including 97 HIV-positive cases, using AUC. Overall, HIV–TB prevalence was 7.5%, ranging from 0% to 32.5%. Global Moran's $I = 0.257$, with $p = 0.061$. Age was the strongest predictor, followed by geographical location and male sex. Age was associated with higher odds of co-infection $(\mathrm{OR} = 1.01; 95\%\,\mathrm{CI} : 1.003 - -1.016; p < 0.01)$. Patients referred for follow-up testing had lower odds of co-infection than those presenting for initial diagnosis $(\mathrm{OR} = 0.77; 95\%\,\mathrm{CI} : 0.64 - -0.92; p < 0.01)$. XGBoost achieved the highest AUC of 0.749, followed by support vector machine at 0.720, random forest at 0.701, and logistic regression at 0.695. HIV–TB co-infection in Nigeria shows marked geographic heterogeneity, with acceptable but not clinically sufficient discrimination for predicting co-infection. The findings can help identify hidden hotspots, optimise resource allocation, and enhance case detection rates in a country with one of the highest TB/HIV burdens in Africa.

Submission 192

The Impact of Spatial Connectivity Structures on Model Fit, Inference, and Data Integration in Spatial Epidemiology and Wastewater-Based Epidemiology: A Systematic Review

Authors: Claris Siyamayambo & Inger Fabris-Rotelli
Affiliation(s): Department of Statistics, Faculty of Natural and Agricultural Sciences, University of; Pretoria, South Africa
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Keywords: Spatial connectivity structures; spatial weights matrix; CAR/BYM; spatial; epidemiology; wastewater-based epidemiology; misaligned data; model fit; inference;; behaviour-informed connectivity
Presentation: Hall: Poster Area, Date: Wednesday 24 June, Time: 16:00-17:00

Abstract

Background: Spatial connectivity structures, how geographic units are defined as neighbors via contiguity, distance, k-nearest neighbors, or network-informed weights, are foundational to classical spatial models (SAR, GWR, CAR/BYM). Evidence across spatial epidemiology, public health, and wastewater-based epidemiology (WBE) demonstrates that connectivity choices materially influence model fit, parameter estimation, and epidemiological inference. This is particularly consequential when integrating incomplete, misaligned, or disjoint data from clinical, survey, and wastewater sources. Methods: We synthesized evidence from peer-reviewed literature (2000–2026) applying CAR/BYM, SAR, GWR, and SPDE-based models in spatial epidemiology and WBE. We extracted findings on: (i) connectivity structure types and their effects on model fit (DIC, WAIC, AIC, RMSE); (ii) influence on parameter estimation and inference (coefficients, standard errors, spatial effects); (iii) handling of misaligned data (e.g., hospitalwastewater catchment misalignment); and (iv) the role of behaviour-informed connectivity from survey data. Preliminary Key Findings: Connectivity choice affects model fit: Across multiple studies, DIC and WAIC consistently favor spatial models with structured random effects over nonspatial alternatives. Changing the connectivity structure (e.g., from contiguity to distancebased or mobility-informed weights) alters AIC by meaningful margins, with BYM/BYM2 and Leroux CAR often outperforming intrinsic CAR depending on data characteristics. SPDE-based and Leroux priors show dataset-dependent improvements in fit and predictive performance. Parameter estimation and inference are sensitive to connectivity: The chosen neighborhood graph governs smoothing, identifiability of spatial effects, and precision of estimates for reproduction number (Rt) and case ascertainment rate (CAR). Misspecified connectivity can bias parameter estimates and alter significance of covariate effects. Spatial models that incorporate structured random effects improve uncertainty quantification and inference stability. Misaligned and disjoint data require connectivity-aware methods: Hospital-wastewater catchment misalignment is a concrete challenge where sewer-network-defined catchments rarely align with health jurisdiction boundaries. Connectivity structures that reflect sewer topology and population mobility improve integration of clinical and wastewater data. GIS-based catchment delineation and coupled epidemiological-hydraulic models provide principled approaches to reconcile misalignment.

Submission 74

Stacked Ensemble Machine Learning Models for Predicting Post-Endoscopic Retrograde Cholangiopancreatography Pancreatitis in South Africa

Authors: Adeboye Azeez; Sergio Vieira; Colin Noel
Affiliation(s): University of the Free State, South Africa
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Keywords: Machine learning; stacked ensemble; Random Forest; XGBoost; clinical prediction models; decision curve analysis; ROC analysis
Presentation: Hall: Poster Area, Date: Wednesday 24 June, Time: 16:00-17:00

Abstract

Background: Post-endoscopic retrograde cholangiopancreatography (ERCP) pancreatitis (PEP) remains a significant complication with variable incidence and clinical impact. Early identification of high-risk patients is essential to guide preventive strategies. This study developed and evaluated stacked ensemble machine learning models to predict PEP using simulated and real-world clinical datasets from a tertiary academic hospital in South Africa. Methods: A Random Forest (RF) model was implemented as a base learner, and its predicted probabilities were incorporated into two meta-models: Logistic Regression (RFLR) and Extreme Gradient Boosting (RFXGBoost). Two stacked ensemble models were developed: Random Forest-Logistic Regression (RFLR) and Random ForestXGBoost (RFXGBoost). Class imbalance was addressed using the synthetic minority oversampling technique (SMOTE). Model performance was evaluated using external validation datasets with metrics including accuracy, sensitivity, specificity, AUC, calibration (Brier score), and decision curve analysis. Costeffectiveness and risk stratification were also assessed. Results: Across both simulated and clinical datasets, the RFXGBoost model demonstrated improved predictive performance, achieving higher accuracy (0.897), better calibration (Brier score = 0.184), and stronger discrimination (AUC = 0.802; 95% CI: 0.656–0.947) compared with RFLR. Decision curve analysis indicated greater net clinical benefit across a range of threshold probabilities. The model also showed positive cost-effectiveness, with optimal thresholds balancing intervention and prevention. Risk stratification analysis revealed clear separation of patients into lowand high-risk groups, with true PEP cases concentrated in higher-risk categories. Conclusions: The RFXGBoost model showed superior predictive performance and clinical utility, supporting its use for improved PEP risk stratification and targeted preventive decision-making.

Submission 108

A Virtual Museum Prototype for Archaeological Heritage in Benguela Province

Authors: Jose Francisco de Oliveira, Jean-Pierre Caliste and Imaculada Quinda
Affiliation(s): Universidade Agostinho Neto (Angola)
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Keywords: Virtual museum, Archaeological heritage, Virtual reality, 3D visualization,; Machine Learning
Presentation: Hall: Poster Area, Date: Wednesday 24 June, Time: 16:00-17:00

Abstract

This work presents the development of a virtual museum prototype for the archaeological heritage of Benguela province, designed to run directly on Hanset VR headsets. The system allows users to explore artifacts and historical contexts in an immersive and interactive manner, providing educational experiences that simulate a physical museum visit. To manage and organize digital content, an efficient data structure was created, storing detailed information for each artifact, including descriptions, dates, and 3D images. Furthermore, data science techniques, including Machine Learning, are applied to analyze user behavior within the prototype, providing insights into interaction patterns and enabling

future optimizations of the experience. The approach integrates software engineering, 3D visualization, and data analysis, demonstrating how digital technologies can be combined to preserve, value, and promote local cultural heritage. The results indicate that the prototype not only fosters immersion and experiential learning, but also provides an innovative platform for archaeological research, education, and cultural promotion, potentially serving as a model for the development of virtual museums in other contexts.

Submission 129

Optimising Socially Responsive Grid-Connected Hybrid Renewable Energy Systems: What Algorithm Behaviour Reveals

Authors: Dhruti Dheda
Affiliation(s): Wits University
Scientific theme: Theme 4: Business, Financial, Economic, Organisational, Governance, Cybersecurity, and Intelligent Infrastructure Analytics
Keywords: Keywords to be verified
Presentation: Hall: Poster Area, Date: Wednesday 24 June, Time: 16:00-17:00

Abstract

The integration of social indicators into energy system optimisation is increasingly important as countries pursue more equitable and community-aligned renewable energy pathways. Although recent work has shown that social metrics such as Job Creation (JC) can be embedded within multi-objective optimisation (MOO) models for grid-connected hybrid renewable energy systems(GC-HRESs), less attention has been given to how algorithm behaviour itself evolves when these additional objectives are introduced. This study examines the behaviour of two metaheuristic algorithms, Multi-Objective Particle Swarm Optimisation (MOPSO) and Non-Dominated Sorting Genetic Algorithm II (NSGA-II), as they navigate a design space defined by technical, economic, environmental, and social criteria. The work reflects on convergence tendencies, solution diversity, and shifting trade-off dynamics observed when social objectives are incorporated into the MOO. Particular attention is given to how employment factors and diversity preservation mechanisms influence the types of solutions preferred by each algorithm. The analysis highlights clear behavioural contrasts between MOPSO and NSGA-II and outlines their implications for future optimisation frameworks capable of integrating broader social indicators beyond JC.

Submission 117

A quantitative analysis of factors influencing COVID-19 vaccine hesitancy in South Africa

Authors: Lina Mohlala
Affiliation(s): University of Witwatersrand
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Keywords: Regression analysis, Institutional trust, Afrobarometer
Presentation: Hall: Poster Area, Date: Wednesday 24 June, Time: 16:00-17:00

Abstract

This study investigates the sociodemographic and behavioural determinants of COVID-19 vaccine hesitancy in South Africa. Using nationally representative data from Afrobarometer (2021) and NIDS-CRAM (2021), regression analysis was used to assess willingness to vaccinate during the early vaccine rollout. The results show that vaccine acceptance increased over time, although variation persisted across population groups. Age was the most reliable demographic predictor, with older participants exhibiting a greater willingness to vaccinate. Behavioural factors added important explanatory power beyond demographic characteristics, particularly trust in government assurances of vaccine safety. Belief that prayer is more effective than vaccination was negatively associated with willingness to vaccinate, while self-reported knowledge showed mixed effects. Institutional trust had a greater influence than differences in education and urban-rural residence. These findings highlight trust as a key driver of vaccine attitudes and indicate that it is necessary to implement trust-sensitive, community-engaged strategies to strengthen vaccine confidence and support effective public health interventions in South Africa.

Submission 118

Evaluating the acceptability, usability and clinical appropriateness of Your Path, an AI-powered tool facilitating relevant access to HIV services post-HIV self-testing in South Africa

Authors: Nomsa B. Mahlalela; Onthatile Maboa; Caroline Govathson; Laura Rossouw; Lawrence Long; Ross Greener; Sarah Morris; Shawna Cooper; Sasha Frade; Sophie Pascoe; Candice; Chetty-Makkan

Affiliation(s): Department of Global Health, Boston University School of Public Health, Boston, MA, USA; Audere Africa, Johannesburg, Gauteng, South Africa

Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics

Keywords: Artificial intelligence, HIV self-testing, AI-powered tool

Presentation: Hall: Poster Area, Date: Wednesday 24 June, Time: 16:00-17:00

Abstract

Audere, Seattle, WA, USA Theme: Closing the gaps – advancing equitable health systems and policies Introduction HIV self-testing (HIVST) increases access to HIV testing, but its impact depends on effective linkage to prevention or treatment services. Uncertainty about next steps could limit linkage to care. Your Path, an AI-powered conversational companion, was developed to guide clients after HIVST and facilitate linkage to appropriate HIV services. Objectives To evaluate the usability, acceptability, clinical appropriateness, and potential influence of Your Path on intentions to seek HIV services. Methods An exploratory mixed-methods study (Nov–Dec 2024) recruited 100 community members (CMs) and 25 healthcare providers (HCPs) from Indlela's Behavioural Hub in Gauteng, South Africa. CMs completed a baseline survey on service-seeking intentions, used Your Path during a simulated HIVST session where they were randomly assigned a mock HIV-negative or HIV-positive test result, then completed a follow-up survey measuring intentions, usability (SUS, system usability scale), and acceptability. A sub-sample of 25 CMs completed in-depth interviews. HCPs reviewed chat transcripts for clinical appropriateness. Results CMs were predominantly female (59.0%), median age 28.8 years. After using Your Path, most (91.0%) reported increased intention to access HIV services. Usability was high (mean SUS score 81.6, SD 17.5); and acceptability was strong (83.7% finding it easy to use, 94.9% willing to use it again). However, some (15.3%) noted that the tool did not always provide consistent responses, and a third (33.6%) anticipated needing initial assistance to fully understand the tool. CMs valued its private, non-judgmental tone. HCPs

Submission 196

Integration Of Sentinel-1 And Sentinel-2 For An Enhanced Land Use And Cover Mapping In Mountainous Regions

Authors: Morena John Mapuru; Phumlani Zwane; Abuelgasim Musa; Mohamed A. M. Abd; Elbasit
Affiliation(s): Department of Physical and Earth Sciences, Sol Plaatje University, Kimberley 8301, South; Africa
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Keywords: Synthetic Aperture Radar, Land Use and Cover, Random Forest, CART
Presentation: Hall: Poster Area, Date: Wednesday 24 June, Time: 16:00-17:00

Abstract

Accurate Land Use/Land Cover (LULC) mapping in mountainous environments remains challenging due to spectral similarity among surface classes, seasonal vegetation variability, and weather and terrain-induced distortions. This study evaluated the effectiveness of multisensor data fusion for LULC classification in QwaQwa, South Africa, using multispectral imagery from Sentinel-2 and Synthetic Aperture Radar (SAR) data from Sentinel-1. Summer and winter classifications were performed using Random Forest (RF) and Classification and Regression Trees (CART) algorithms to assess seasonal robustness and algorithm performance. Spectral analysis revealed strong class separability in the red-edge, near-infrared (NIR), and shortwave infrared (SWIR) regions during summer, while winter conditions introduced increased confusion between grassland and bare land due to vegetation senescence. The fused Sentinel-1 and Sentinel-2 RF model achieved the highest performance, with overall accuracies of 95% (summer) and 93% (winter), outperforming CART in both seasons. SAR-derived variables, particularly VH polarization and mean backscatter, significantly improved discrimination of built-up areas, roads, and woody vegetation by incorporating structural information insensitive to seasonal optical variability. Despite minor misclassification in fragmented and transitional zones, the integration of optical and radar data enhanced classification stability, spatial coherence, and seasonal consistency. The findings demonstrate that multi-sensor fusion combined with ensemble machine learning provides a robust and transferable framework for operational LULC mapping in complex mountainous landscapes, supporting environmental monitoring, urban planning, and sustainable resource management.

Submission 223

Modelling Tourist Arrivals to South Africa in the Presence of a Structural Break: COVID-19

Authors: Musara Chipumuro
Affiliation(s): Great Zimbabwe University
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Keywords: Tourist arrivals, SARIMAX, Intervention analysis, SADC, COVID-19
Presentation: Hall: Poster Area, Date: Wednesday 24 June, Time: 16:00-17:00

Abstract

This study examines the impact of the COVID-19 pandemic on monthly tourist arrivals to South Africa (SA) from the Southern African Development Community (SADC) region using a Box-Tiao intervention

modelling framework. As existing studies largely provide descriptive evidence of tourism declines, limited attention has been given to quantifying the persistence of pandemic-induced shocks within a rigorous time series framework, particularly in the context of intra-African tourism flows. Monthly data from January 2009 to December 2023 is used in developing a Seasonal Autoregressive Integrated Moving Average model with exogenous variables (SARIMAX) that incorporates a pulse intervention to capture the abrupt shock associated with the onset of COVID-19. A baseline SARIMA model is first established and subsequently extended to include the intervention effect and identify outliers. Model performance is evaluated using the Akaike Information Criterion (AIC), Mean Absolute Percentage Error (MAPE), Mean Absolute Error (MAE) and Root Mean Square Error (RMSE). The results of this study indicate that the intervention model substantially outperforms the baseline specification, with AIC improving from -278.92 to -418.36, alongside consistent reductions in forecast error metrics. The estimated intervention effect reveals a sharp decline in tourist arrivals at the onset of the pandemic, followed by a slow and highly persistent recovery process, as evidenced by a decay parameter $\omega_2 = 0.9662$. These findings highlight the prolonged disruption caused by COVID-19 on regional tourism flows and underscore the importance of intervention modelling for capturing structural breaks and improving forecasting accuracy. The results of this study highlight the need for resilient and adaptive tourism strategies in the face of external shocks.

Submission 23

Multicenter EMR-Based Prediction of Extubation Failure Using Time Series Measurements and Clinical Notes

Authors: Eyob Mulugeta; Merga Belina; Awgichew Kifle; Menore Tekeba; Bisrat Derebssa; Hanan Yusuf
Affiliation(s): Addis Ababa University, Ethiopia
Scientific theme: Theme 4: Research Data Management, Open Data, Institutional Analytics, and Educational AI
Keywords: Extubation Failure Prediction, Intensive Care Unit Data Analytics, Clinical Decision Support Systems, Multimodal Machine Learning, Time Series Modeling in Healthcare, Natural Language Processing for Clinical Notes
Presentation: Hall: Poster Area, Date: Wednesday 24 June, Time: 16:00-17:00

Abstract

Title Multicenter EMR-Based Prediction of Extubation Failure Using Time Series Measurements and Clinical Notes PR OP OS A L Background Extubation failure remains a major challenge in intensive care units. Studies show that to 20 percent of patients require reintubation within 48 to 72 hours after planned extubation. In Ethiopia, local evidence reports a failure rate of 12.33 percent among ICU patients. Extubation failure is associated with increased mortality, prolonged ICU stay, and higher healthcare costs. Current decision-making relies heavily on clinician judgment and structured protocols, which often fail to capture complex temporal physiological changes and bedside clinical observations documented in free-text notes. Problem Statement Existing predictive models largely rely on static or aggregated structured data and rarely integrate longitudinal time-series signals with unstructured clinical notes. In Ethiopia, no locally validated multicenter predictive model exists to support extubation decisionmaking. This creates a gap in evidence-based, data-driven ICU support tools. Objective The main objective of this study is to develop an explainable multicenter machine learning model that integrates structured static data, longitudinal ICU time-series data, and unstructured clinical notes to predict extubation failure among adult ICU patients. ES IS Methods This study adopts a retrospective multicenter observational design. Data will be extracted from electronic medical record systems of five tertiary hospitals in Addis Ababa, with an estimated cohort of approximately 5,399 adult ICU patients. TH Inclusion criteria include adult patients who received invasive mechanical ventilation for more than 12 hours and underwent planned extubation. Extubation failure will be defined as reintubation or death within 48 to 72 hours after extubation. Structured

data include demographic characteristics, laboratory values, ventilator parameters, vital signs, and medication administration records collected within a 72-hour pre-extubation window. Time-series data will be resampled into standardized two-hour intervals. Unstructured clinical notes documented within 48 hours prior to extubation will be processed using Natural Language Processing methods, including ClinicalBERT embeddings. Temporal deep learning models such as LSTM and Temporal Convolutional Networks will be developed and compared against non-temporal baseline models. Multimodal fusion techniques will integrate structured and textual features. Model performance will be evaluated using AUROC, precision, recall, F1 score, and calibration metrics. Explainability techniques such as SHAP will be applied to ensure interpretability. Ethical Considerations Ethical approval will be obtained from Addis Ababa University Institutional Review Board prior to data access. Additional approval will be sought from the Addis Ababa Health Bureau and participating hospitals. The study uses retrospective EMR data. No direct patient contact will occur. All data will be de-identified prior to analysis. Secure storage and restricted access protocols will be implemented to maintain confidentiality.

Submission 115

AI for Scientific Integrity: Evaluating LLMs in Automated Critical Appraisal of Biomedical Research

Authors: Kaela Kokkas
Affiliation(s): University of the Witwatersrand
Scientific theme: Theme 1: Statistical, Mathematical, Computational, NLP, Speech, and Multimodal AI Foundations
Keywords: Large Language Models (LLMs), Scientific Critical Appraisal, AI-Assisted Peer Review, Biomedical Text Analysis
Presentation: Hall: Poster Area, Date: Wednesday 24 June, Time: 16:00-17:00

Abstract

Background: Ensuring the accuracy, consistency, and integrity of scientific literature in biomedicine is critical, yet identifying subtleties such as statistical errors, internal contradictions, and inappropriate citations remains time-consuming and cognitively demanding for authors, reviewers, and researchers. Large Language Models (LLMs) offer a potential solution, however, there is limited empirical evidence assessing their ability to reliably detect nuanced errors within complex scientific texts under realistic, multi-task conditions requiring context-switching and detection of “needle-in-a-haystack” inconsistencies. Methods: We benchmark LLMs (Gemini 2.5 Pro, Gemini 2.5 Flash, GPT-5, and GPT-5 Nano) on automated critical appraisal of biomedical literature across 3 domains: internal consistency, statistical reasoning, and citation relevance. The validation dataset was created by manual evaluation of 13 biomedical research papers, on the topic of Mouse Mammary Tumour Virus-Like Virus and breast cancer, looking for internal contradictions, errors in statistical analysis and results presentation, and relevance of citations. Results: Performance was heterogeneous across models and tasks. Assessment of internal consistency of full-texts presented the most significant challenge, with LLMs providing some fabricated contradictions and failing to identify most human-annotated contradictions. Isolation of contradictory sections improved detection rates markedly, indicating that context window limitations, rather than lack of capability, were a primary constraint. Across statistical appraisal tasks, models inconsistently identified human-annotated errors but detected issues missed by human evaluation. GPT-5 identified irrelevant citations in one paper that were missed by the human evaluator. Conclusion: These findings highlight both the promise and risks of deploying generalist LLMs for AI-assisted scientific critical appraisal. While they show potential to augment peer review and post-publication auditing, their susceptibility to hallucination and sensitivity to long-context inputs necessitate cautious integration. Poor performance in full-text settings underscores the need for methodological advances to mitigate context window limitations. This work

contributes to responsible AI in data science and has implications for strengthening research quality in health and other data-driven domains.

Submission 209

A Machine Learning Approach for Predicting Patient Length of Stay in Zimbabwean Public Hospital

Authors: Maureen Dekete, Evangelista Tasiiwa Nyakujipa
Affiliation(s): Department of Operations Research and Statistics. National University of Science and; Technology
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Keywords: Machine Learning, Deep Learning, Length of Stay Prediction, Public Hospital
Presentation: Hall: Poster Area, Date: Wednesday 24 June, Time: 16:00-17:00

Abstract

Efficient hospital operations are fundamental to quality healthcare delivery, yet public hospitals across Africa face persistent challenges in bed management, resource allocation, and patient flow. In Zimbabwe, a public hospital in Bulawayo; a 1,000-bed tertiary referral centre serving the southern region, experiences chronic overcrowding and operational inefficiencies due to unpredictable patient Length of Stay (LoS). Traditional methods relying on clinical intuition and historical averages have proven inadequate in this resource-limited, high-volume setting. This study develops and validates an interpretable machine learning model to accurately predict inpatient LoS using routinely collected clinical, demographic, and administrative data, thereby providing a decision-support tool for hospital administrators and clinicians. A retrospective cohort study was conducted on adult inpatient admissions ($\geq$18 years) to Internal Medicine, General Surgery, and Orthopaedics at the hospital over a one-year period (January–December 2025). Following the CRISP-DM framework, data preprocessing included missing value imputation, outlier capping (99th percentile), data type conversion, and text standardisation. Machine learning models are to be trained and validated for the prediction of length of stay. The optimised machine learning model that achieve the highest predictive performance is to be considered. This study will demonstrates that locally developed, context-sensitive predictive models are feasible and can empower hospital managers to anticipate bed demand, reduce emergency department bottlenecks, improve discharge planning, and optimise scarce resources.

Submission 218

Adaptive Reinforcement Learning Ensemble Forecasting for High-Burden Disease in Africa

Authors: Christopher Mvelase and Gugulethu Ncube
Affiliation(s): Affiliation(s) to be confirmed
Scientific theme: Theme 2: Health, Bioinformatics, Geospatial, Climate, and Sustainable Development Analytics
Keywords: Country-level surveillance; High burden disease; Reinforcement learning; Decision support
Presentation: Hall: Poster Area, Date: Wednesday 24 June, Time: 16:00-17:00

Abstract

High-burden disease surveillance requires forecasting systems that are not only accurate, but

also adaptive, explainable, and operationally useful for public health decision-making. Despite growing data availability from national surveillance systems, existing tools often fail to account for the heterogeneity of disease dynamics, data quality challenges and the operational realities of resource-constrained health systems. We present a distribution-aware reinforcement learning ensemble forecasting framework that automatically selects the most suitable forecasting approach for each country–disease–indicator combination based on time-series characteristics and recent predictive performance. The framework begins by profiling each series through a context vector capturing data quality, statistical properties, temporal behaviour, and data type, including missingness, outliers, volatility, stationarity, autocorrelation, seasonality, changepoints, regime shifts, and classification as count-like, rate-like, or index-like. A diverse model zoo is then evaluated, spanning classical time-series methods such as moving averages, ARIMA, Prophet, and ETS; epidemic growth models including Logistic and Gompertz curves; and machine learning models with exogenous drivers such as XGBoost and Random Forest for climate and WASH-informed forecasting. Model selection is governed by an RL-lite contextual bandit that uses profiler features, metadata, and forecast horizon as inputs, and optimizes model choice or ensemble weight allocation through rolling backtest rewards penalized for poor calibration. To support transparency, the system stores human-readable selection rationales, such as linking strong seasonality to Prophet-based recommendations. Forecast outputs are fully reproducible and include point estimates, prediction intervals, horizon metadata, model identifiers, and run-level traceability. Beyond prediction, the framework generates decision-ready intelligence through risk scores, threshold exceedance probabilities, growth and acceleration indicators, changepoint alerts, robustness measures, and prioritized public health actions. Structured country-disease briefs in JSON, HTML, or PDF formats provide concise headline risks, forecast summaries, priority actions, and confidence statements. This approach offers a practical pathway for strengthening epidemic intelligence by combining adaptive forecasting, uncertainty-aware model selection, and actionable public health insight in high-burden settings. By grounding the system in African surveillance realities and enabling deployment through accessible output formats, this framework is positioned to directly support ministries of health and public health practitioners across the continent in making faster, better-informed decisions during disease outbreaks.

39. JOBURG SIGHTSEEING EXPERIENCE

African Data Science Conference 2026

Sponsored by Joburg Tourism Company

As part of the ADSC 2026 delegate experience, the conference will include a Johannesburg sightseeing component sponsored by **Joburg Tourism Company**. This initiative is intended to enrich the conference experience by allowing delegates to engage with the city beyond the formal academic programme. Johannesburg is a major African centre of knowledge, finance, innovation, culture, history, entrepreneurship, and urban transformation. The sightseeing experience will provide delegates with an opportunity to appreciate the broader social, historical, cultural, and economic context in which ADSC 2026 is hosted. It also reflects the conference theme, **African Data Science, for Africa**, by situating scientific exchange within one of the continent's most dynamic urban environments. The sightseeing component will be designed to support networking, informal engagement, and cultural orientation for delegates, particularly those visiting Johannesburg for the first time.

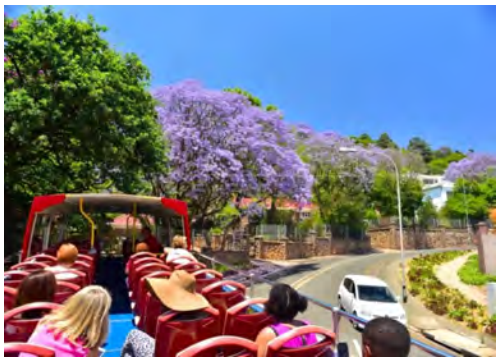
SIGHTSEEING PREVIEW

Bus and City Tour Experience



Johannesburg Sightseeing Bus

Delegate sightseeing experience sponsored by Joburg Tourism Company.



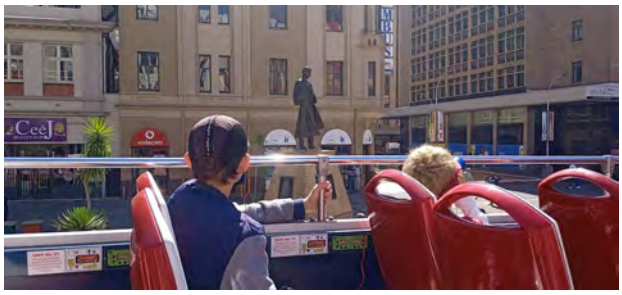
City Tour Transport

A guided city-orientation experience for ADSC 2026 delegates.



Johannesburg City Experience

An opportunity to connect with Johannesburg's history, culture, innovation, and urban life.



Delegate Tour Experience

Informal networking and cultural orientation beyond the formal conference programme.

DELEGATE EXPERIENCE

Johannesburg as a Conference City

Experience	Johannesburg sightseeing and delegate city-orientation experience.
Sponsor	Joburg Tourism Company.
Purpose	To provide ADSC 2026 delegates with an opportunity to experience Johannesburg as a centre of African knowledge, culture, innovation, history, business, and urban transformation.
Audience	Registered ADSC 2026 delegates, invited guests, partners, sponsors, and participating stakeholders, subject to final logistics and capacity.
Format	Guided sightseeing, cultural orientation, informal networking, and city-experience engagement. Final details will be communicated to registered delegates.

Indicative experience themes

- Johannesburg as a city of knowledge, research, innovation, finance, and entrepreneurship.
- The historical and cultural significance of Johannesburg in South Africa and the African continent.
- Urban transformation, digital infrastructure, mobility, and city-level development.
- Informal networking among delegates, partners, sponsors, and local stakeholders.
- Strengthening the connection between conference participation and place-based experience.

ADSC 2026 gratefully acknowledges Joburg Tourism Company for supporting the Johannesburg sightseeing experience.

40. SPONSORS, PARTNERS AND SUPPORTERS

African Data Science Conference 2026

With appreciation to our institutional partners, sponsors, collaborators, and supporters

ADSC 2026 gratefully acknowledges the generous support of its sponsors, partners, collaborators, and institutional supporters. Their contributions help make the conference possible and strengthen its role as a continental platform for advancing **African Data Science, for Africa**. Through financial support, institutional collaboration, technical expertise, workshop participation, research leadership, exhibition engagement, delegate support, and public-facing partnerships, these organisations contribute directly to the growth of African data science and artificial intelligence.

Their support enables ADSC 2026 to bring together researchers, postgraduate students, industry practitioners, policymakers, innovators, public-sector stakeholders, professional bodies, and institutional leaders in one shared space for scientific exchange, capacity development, and meaningful collaboration. It also supports critical conference activities, including keynote sessions, scientific presentations, pre-conference workshops, panel discussions, poster engagement, the Tech Exhibition, employability-focused dialogue, student participation, research visibility, and special delegate experiences.

We particularly recognise the importance of partnerships that connect universities, research institutes, industry, government, regulators, technology organisations, professional communities, and civic institutions. Such cross-sector collaboration is essential for building data science ecosystems that are not only technically excellent, but also socially responsible, ethically grounded, locally relevant, and responsive to African development priorities.

By supporting ADSC 2026, our sponsors and partners are investing in more than a conference. They are helping to build a community of practice committed to responsible AI, open research, postgraduate development, innovation, digital transformation, institutional capacity-building, and evidence-informed decision-making across the African continent. We are deeply grateful for their confidence, collaboration, and contribution to this shared vision.

ADSC Partners and Sponsors

41. ACKNOWLEDGEMENTS

With Appreciation from ADSC 2026

Recognising the individuals, institutions, and partners whose collective effort made this conference possible.

The African Data Science Conference 2026 is made possible through the contributions of many individuals, committees, institutions, sponsors, partners, reviewers, volunteers, and delegates. ADSC 2026 gratefully acknowledges all who have supported the development of this conference as a platform for African-centred data science, artificial intelligence, research exchange, innovation, and collaboration.

ADSC 2026 extends its sincere appreciation to all individuals, institutions, partners, and communities whose contributions have made this conference possible. We gratefully acknowledge the University of the Witwatersrand for hosting the conference and for providing an enabling institutional environment for African-centred research, innovation, postgraduate development, and interdisciplinary collaboration. We also thank Wits Enterprise for its administrative, registration, logistical, and operational support throughout the planning and delivery of the conference.

We express our deep gratitude to the Scientific Committee for safeguarding the academic integrity, scholarly direction, peer-review process, and intellectual quality of ADSC 2026. We are equally grateful to the Local Organising Committee for coordinating the many operational, logistical, stakeholder-engagement, and implementation details required to bring together a conference of this scale and ambition. We also acknowledge the Advisory Group for its strategic guidance, institutional insight, and commitment to strengthening the broader vision of **African Data Science, for Africa**.

The conference would not have been possible without the generous intellectual labour of scientific reviewers, programme contributors, session chairs, panel chairs, workshop facilitators, keynote speakers, panellists, authors, oral presenters, and poster presenters. Their expertise, time, and commitment have shaped a programme that is academically rigorous, practically relevant, interdisciplinary, and responsive to the needs and opportunities of the African data science ecosystem.

We also extend heartfelt appreciation to the student representatives, volunteers, technical support teams, administrative colleagues, and on-site support staff whose work contributes directly to the delegate experience. Their contribution ensures that sessions run smoothly, delegates are supported, and the conference environment remains welcoming, organised, and professional.

ADSC 2026 gratefully acknowledges its sponsors, partners, exhibitors, institutional supporters, industry collaborators, professional bodies, and public-sector stakeholders. Their support reflects a shared commitment to building strong connections between academia, industry, government, and society. Through their involvement, the conference is able to support research exchange, innovation, employability engagement, technology demonstration, and long-term collaboration across sectors.

We also acknowledge Joburg Tourism Company for supporting the Johannesburg delegate experience and for helping position the city as an important African centre of knowledge, innovation, culture, entrepreneurship, and urban transformation. Their contribution enriches the conference by connecting delegates not only to the academic programme, but also to the broader social, historical, and economic context of Johannesburg.

Finally, we thank all delegates for being part of ADSC 2026. Your participation, questions,

presentations, conversations, and collaborations give life to the conference. Together, we are building a continental platform for advancing data science, artificial intelligence, statistics, analytics, research data management, digital innovation, and responsible technology development in ways that are excellent, inclusive, ethical, and deeply connected to African realities.

ADSC 2026 is made possible by collective effort. We are grateful to everyone who has contributed to this shared vision of **African Data Science, for Africa**.

42. CONTACT AND HELPDESK

Delegate Support and Conference Communication

Reach the right person quickly — we are here to help before, during, and after the conference.

General enquiries	Contact adsc2026@easychair.com for general enquiries.
Registration and payment	Contact conferences.witsenterprise@wits.ac.za for general enquiries.
Programme enquiries	Contact farai.mlambo@wits.ac.za for programme enquiries.
Portal support	Contact charles.farirayi@wits.ac.za for portal support.
Workshop enquiries	Contact ndivhuwo.makondo@ibm.co.za for workshop enquiries.
Sponsorship and exhibition	Contact conferences.witsenterprise@wits.ac.za for sponsorship and exhibition enquiries.
On-site logistics	Contact taariq.surtee@wits.ac.za for on-site logistics.
Emergency contact	Contact (+27) 011 717 4444 or (+27) 011 717 6666

43. FINAL DISCLAIMER

Programme Updates and Delegate Planning

This programme is subject to revision. Delegates are encouraged to check official channels for updates.

This programme is provided as an official guide to support delegate planning for the African Data Science Conference 2026. It has been prepared to help delegates navigate the conference structure, understand the sequence of activities, identify sessions of interest, and engage meaningfully with the scientific, professional, social, and networking opportunities offered throughout ADSC 2026.

The programme remains a working document and is therefore subject to revision. Session titles, speakers, panellists, workshop details, paper allocations, poster arrangements, venues, rooms, timings, exhibition arrangements, catering locations, sightseeing logistics, Digital Dome arrangements, and special activities may be updated as planning is finalised. Any changes will be made with the aim of protecting programme quality, academic integrity, operational feasibility, delegate experience, and the smooth running of the conference.

Delegates are encouraged to consult this booklet together with the ADSC 2026 Delegate Portal, official conference announcements, email communication, venue signage, session-room notices, and help desk updates. The Delegate Portal will serve as an important source of current information, particularly for schedule updates, room allocations, delegate networking, announcements, and changes that may arise during the conference.

While every effort will be made to maintain the published structure of the programme, the organising committee reserves the right to make adjustments where necessary. Such adjustments may include changes to session order, speaker availability, room allocation, timing, format, or associated conference activities. Delegates are therefore advised to check the latest information regularly, arrive on time for sessions, and follow guidance from session chairs, venue staff, the help desk, and the organising team.

The programme is intended to support a productive, well-coordinated, inclusive, and intellectually engaging conference experience. ADSC 2026 appreciates the understanding and cooperation of all delegates as the conference team works to deliver a high-quality gathering under the theme **African Data Science, for Africa**.