Japheth Mursi, Ph.D.

AI Research Lead | NLP & Multi-Agent Systems for Social Impact
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Research Focus: Natural Language Processing (NLP), Reinforcement Learning, Agent-Based Modeling (ABM), and Explainable AI (XAI) for Policy-Informed Solutions in Financial Inclusion, Public Health, and Digital Trust.

Professional Profile

Accomplished AI researcher and educator with a Ph.D. in Information Systems, specializing in developing applied machine learning solutions for socio-economic challenges in emerging economies. Proven expertise in leading interdisciplinary projects that leverage NLP, Large Language Models (LLMs), and Agent-Based Modelling to address real-world problems in financial fraud, misinformation, and public health. Award-winning researcher with a strong record of securing grants, building research capacity, and translating technical innovation into actionable policy insights, directly supporting the UN Sustainable Development Goals (SDGs).

Education

Ph.D. in Information Systems & Technology | University of KwaZulu-Natal, South Africa | 2023

> - **Dissertation:** Personality Prediction on social media using Fuzzy Logic and Machine Learning Classifiers
> - *Core: NLP, Reinforcement Learning, ABM, Social Network Analysis*

M.Sc. in Information Technology | Strathmore University, Kenya | 2015

B.Com. in Management Information Systems | Daystar University, Kenya | 2012

Research Leadership & Experience

Coordinator | Daystar Institute of Data Science, AI and Cybersecurity (DIDAC) | 2025 – Present

i. Founded a university research institute dedicated to advancing applied AI and cybersecurity solutions for African contexts.
ii. Lead strategic vision for research on NLP, multi-agent systems, and reinforcement learning, with emphasis on local language data and policy implications.
iii. Secured funding and built partnerships with academia, industry, and international collaborators to support interdisciplinary research initiatives.
iv. Designed and launched capacity-building programs, training early-career researchers and students in AI for social impact.

Co-Founder & Research Lead | IwazoLab, Nairobi | 2023 – 2023

i. Directed development of **Finlingo**, an AI-powered conversational platform using NLP and reinforcement learning for adaptive financial literacy and scam detection.
ii. Led behavioral analytics research and customer preference studies to culturally adapt digital literacy interventions.
iii. Oversaw integration of large language models (LLMs) into educational and fraud-prevention applications.

Research Lead | SIMElab Africa, USIU-Africa | 2022 – 2024

i. Directed a multidisciplinary team of 21 researchers on projects in AI, social media analytics, and digital health.
ii. Spearheaded development of **Habari Harbour**, a social media listening platform using network analysis to combat misinformation, offering actionable insights to policymakers.
iii. Led **Uzazi AIoT**, an AI-powered maternal health tracking system integrating IoT technologies and agent-based modelling concepts for public health interventions.
iv. Organized training workshops and mentored junior researchers, strengthening regional capacity in computational social science and applied AI.

Key Research Achievements & Awards

Best Poster Award | Deep Learning Indaba | Kigali, Rwanda | Sept 2025

➢ Awarded for: *"Kenyan Swahili-English Code-Mixed SMS Scam Dataset: A Multilingual Resource for Fraud Detection in East Africa"*.

➢ Recognized for creating a novel, publicly available dataset addressing a critical gap in NLP for low-resource, multilingual contexts.

Lead Author (Publication Under Review) | IEEE ICTMOD 2025

➢ **AI Against Smishing in Kenya: Culturally Adapted SMS Scam Detection for Digital Trust.**

➢ Achieved **83.8% accuracy** in scam detection using XGBoost and Logistic Regression.

➢ Applied **Explainable AI (XAI/SHAP)** to identify key predictive features (urgency, code-switching), enhancing transparency and providing insights for telecom and financial policy.

KENET Travel Grant | 2024

Selected Publications

1. **Mursi, J. K.**, et al. (2025). AI Against Smishing in Kenya: Culturally Adapted SMS Scam Detection for Digital Trust. *IEEE ICTMOD* [Under Review].

2. **Mursi, J. K.**, & Nach, H. (2024). Finlingo: A Conversational AI for Enhancing Financial Literacy Education in Africa. *Proc. IEEE ICTMOD*.

3. Nach, H., & **Mursi, J.** (2024). Financial Inclusion Through Frugal Innovation: Cases from Emerging Economies. *Edward Elgar Publishing* [In Press].

4. **Mursi, J. K.**, Subramaniam, P. R., & Govender, I. (2023). Exploring the Influence of Preprocessing Techniques in Obtaining Labelled Data from Twitter. *IEEE Explore.*

5. Wamuyu, P. K., & **Mursi, J.** (2020). Customer Profiling from Social Media Engagement using LDA and Sentiment Analysis. *Kabarak University Conference Proceedings.*

Teaching Experience

Assistant Professor – Data Science | Daystar University | Feb 2025 – Present

i. each and supervise projects in Reinforcement Learning, Agent-Based Modelling, and NLP.
ii. Designed and delivered undergraduate and graduate courses, including Reinforcement Learning for Data Science (Undergraduate) **and** Data Governance & Ethics (Master's level), alongside Database Systems, Business Analytics, and Social Media Analytics.
iii. Integrated policy and governance case studies into technical teaching, showing how AI intersects with financial inclusion, fraud detection, and misinformation management.
iv. Supervised 25+ student projects, mentoring them in applying NLP, reinforcement learning, and social network analysis to real-world socio-economic challenges.
v. Developed Daystar's new **M.Sc. in Applied Data Science Curriculum**, embedding global AI ethics, GDPR/data protection, and SDG-aligned perspectives.

Adjunct Faculty | United States International University-Africa | Jan 2022 – Dec 2024

i. Taught core data science and information systems courses (Machine Learning, Database Systems, and Business Analytics) to diverse student cohorts.
ii. Developed innovative teaching methodologies, blending project-based learning and emerging AI tools.
iii. Collaborated with colleagues across disciplines to enhance curriculum relevance for both technical and social impact dimensions.
iv. Received consistently high student satisfaction ratings (95%), reflecting strong engagement and mentorship in applied data science.

Policy & Ethics Engagement

Facilitator, AI in Research and Academia Workshop | Qhala & Daystar University | 2025

i. **Led Session 3: AI and Research Ethics**, focusing on bias, accountability, and responsible AI in African contexts.-
https://drive.google.com/file/d/1vh5543eeVr0s3xXbFi1TLnV95WuShVkM/view?usp=sharing

ii. Guided discussions on institutional AI policies, referencing frameworks such as UNESCO's recommendations, and highlighting the urgent need for universities to establish governance structures.
iii. Contributed to African dataset policy discussions at Deep Learning Indaba 2025, addressing challenges of bias, underrepresentation of African languages and contexts, and the need to build inclusive, representative AI models.
iv. Advocated for **African data sovereignty**, stressing the importance of protecting sensitive and indigenous knowledge from exploitation while ensuring equitable participation in global AI research.

Ongoing Projects

- **Kenyan Swahili-English Code-Mixed SMS Scam Dataset (2025–)**
    - Developed a multilingual dataset for fraud detection in East Africa.
    - Collaboration with Carnegie Mellon University Africa to deploy models in Kenya.
    - Establishing a honeynet infrastructure to study and counter SMS scammers.
    - Started comparative research with (e.g., MOZ-Smishing dataset team in Mozambique) for cross-country fraud analysis.
- **Habari Harbour (2024–2024)**
    - Social media listening platform for misinformation monitoring, offering insights to policymakers and civil society.
- **Finlingo (2023– 2023)**
    - Conversational AI platform to enhance financial literacy and scam awareness, leveraging NLP + reinforcement learning.
- **Uzazi AIoT (2023–2024)**
    - IoT-enabled maternal health platform, combining AI-driven monitoring and decision support for public health.

Service & Leadership

Academic Leadership

- University Council Member | KAG East University (2023 – 2026)
- Program Assessment Committee Member for data science curriculum evaluation
- Peer Reviewer for various international journals and conferences

Community Engagement

- Lead Mentor | NiweBora Leadership Programme (2021 – Present)
- K-Teens Teacher & Media Ministry Volunteer | ICC Kitengela (2022 – Present)

Technical Skills

- **Programming:** Python (TensorFlow, PyTorch, Scikit-learn), R, SQL

- **AI/ML:** Natural Language Processing (NLP), Large Language Models (LLMs), Reinforcement Learning, Explainable AI (XAI/SHAP), Agent-Based Modeling (ABM)
- **Databases:** MySQL, PostgreSQL, MongoDB
- **Cloud & Analytics:** AWS, Google Cloud, Azure, Apache Spark, Tableau, Power BI

Alignment with UN & SDGs

- Developed AI platforms targeting SDG 1 (No Poverty), SDG 3 (Good Health), SDG 4 (Quality Education), SDG 9 (Innovation), and SDG 16 (Peace, Justice & Strong Institutions).

- Advocate for African data sovereignty and inclusive AI governance (Deep Learning Indaba 2025).

- Proven record in translating AI research into actionable policy insights for financial inclusion, misinformation countering, and healthcare.

References

1. Dr. Patrick Kanyi Wamuyu Dean, School of Graduate Studies United States International University-Africa email: kanyiwamuyu@gmail.com| Cell: +254722309076 Relationship: Direct Supervisor & Collaborator
2. Prof. Prabhakar Subramaniam Rontala Associate Professor, Information Systems and Technology University of KwaZulu-Natal, South Africa email: prabhakarr@ukzn.ac.za| cell: +27312607704 Relationship: Ph.D. Supervisor
3. Rev. William Odero Senior Pastor, ICC-Kitengela email: william.odero@gmail.com| cell: +254723733003 Relationship: Character Reference & Community Leadership