

DENISH AZAMUKE

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BIO DATA

Date of Birth: 16/02/1998	Citizenship: Ugandan
Gender: Male	Work Email: adenish@utamu.ac.ug
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CURRENT POSITION

Senior Lecturer, School of Technology, Computing & Engineering, Universal Technology And Management University (UTAMU), Uganda, as of June 1, 2026.

RESEARCH INTERESTS

Machine Learning (ML) and Artificial Intelligence (AI), including deep learning, AI/ML-driven financial fraud detection, post-training of large language models (LLMs), differential privacy, and broader applications of AI/ML.

Highest Qualification: PhD in Computer Science, awarded at the 76th Graduation Ceremony of Makerere University on February 24, 2026.

EDUCATION

Makerere University (MAK) PhD in Computer Science 3-year Google PhD Fellowship recipient.	<i>2022 - 2026</i>
African Institute for Mathematical Sciences (AIMS) MSc in Mathematical Sciences 1-year AIMS Master's Scholarship recipient.	<i>2020 - 2021</i>
Makerere University (MAK) BSc in Computer Science 3-year Government of Uganda National Merit Sponsorship recipient.	<i>2016 - 2019</i>

TEACHING EXPERIENCE

Senior Lecturer, UTAMU	<i>June 2026 – Present</i>
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- As a Senior Lecturer, I teach graduate-level courses and lead research in computing and AI/ML, with a focus on applications that deliver societal benefit.

Part-Time Lecturer, UTAMU	<i>May 2026</i>
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- As a Part-Time Lecturer, I taught six (06) courses, including CIS 7100 Data Warehousing, M26.CSC 7101 - Information Security/CS 511 Information Security, M26.CAI 7200 - Big Data Analytics, M26.CIT 7104 - IT Strategic Planning & Management/IT 503 IT Strategic Planning & Management, M26.CSC 7102 - Machine Learning/CS 507 Machine Learning, and M26.CIS 7202 - Data Mining/IS 503 Data Mining at the graduate level.

Teaching Assistant, Department of Computer Science (MAK)	<i>2022 – 2026</i>
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- As a graduate fellow (doctoral researcher) in the Department of Computer Science since 2022, I have taught several computer science courses at the undergraduate level, including CSC 1204 Data Structures and Algorithms, CSC 1201 Probability and Statistics, CSC 1304 Practical Skills Development, and CSC 3207 Computer Security, as well as MCS 7208 Data Mining at the graduate level (MSc in Computer Science).

- I have also supervised postgraduate students to completion, particularly master’s students in the Computer Science program, on research projects. These projects are listed here: azamuke.com/supervision.

RESEARCH EXPERIENCE

Researcher, UTAMU

May 2026 – Present

- As of May 2026, I have prepared two grant proposals to initiate a new research agenda at UTAMU. The following are the details:

Grant Title and PI	Total Budget	Status
Interpretable Detection and Steering of Deceptive Behavior in Mobile Money LLM Assistants • Principal Investigator: Dr. Denish Azamuke	USD 300,000	Submitted on May 25, 2026
AI-Driven Multi-Currency Detection of Counterfeit Banknotes Across Eastern Africa • Principal Investigator: Dr. Denish Azamuke • Co-Investigator: Dr. Kassim Kalinaki	USD 100,000	Fully prepared, to be submitted in August 2026

Doctoral Researcher, Department of Computer Science (MAK)

2022 – 2026

- Investigated and developed **MoMTSim** [1], a multi-agent-based simulation platform calibrated to generate large volumes of mobile money transaction datasets for machine-learning-based fraud detection. Published in the *IEEE Access* journal. Open source: github.com/aiinfinancegroup/MoMTSim. Demo video: youtube.com/watch?v=MnAUVsZ1Xy8.
- Investigated and developed a **differentially private variant of the simulator**, **MoMTSimDP** [2], for generating mobile money transaction datasets with enhanced privacy guarantees. **MoMTSimDP** facilitates privacy-preserving simulations and the release of synthetic datasets for secure data sharing and analytics. Published in the *IEEE/ACM Symposium on Software Engineering in the Global South (SEiGS)*. Short explainer video: youtube.com/watch?v=9KvzfNYS7ZA.
- **Enhanced ML-based fraud detection using mobile money transaction datasets** [3], [4], [5], [6]. Published synthetic mobile money transaction datasets that statistically resemble source data in the *Elsevier Journal of Data in Brief* [5], and authored research articles on financial fraud detection using machine learning in *Springer Lecture Notes in Computer Science* [3], [4]. Visualized transaction patterns: demo video youtube.com/watch?v=4wd8D-Sfcwo.
- Led community outreach initiatives in Uganda, culminating in the design and implementation of a **counterfeit currency detection system** using deep convolutional neural networks, including **ResNet50V2**, **InceptionV3**, **Xception**, and **ResNet152V2** [7]. The system analyzes high-resolution banknote images to detect texture anomalies, watermark inconsistencies, and security thread defects. This effort aimed to build trust with local communities, especially women-led and small businesses, to support future research collaborations. Demo video: youtube.com/watch?v=yGUe81XDBbE.

ACADEMIC ACHIEVEMENTS

Google PhD Fellowship

2023 - 2026

- Three-year fellowship awarded to outstanding PhD students from around the world conducting exceptional research in Computer Science and related fields.

AIMS Master’s Scholarship

2020 - 2021

- One-year master’s scholarship awarded to selected students from across Africa.

Uganda Government National Merit University Admission

2016 - 2019

- Three-year academic merit-based sponsorship from the Government for selected students to pursue undergraduate studies at public universities in Uganda.

PEER-REVIEWED PUBLICATIONS (SCOPUS-INDEXED)

As the **lead author**, I have published seven (7) peer-reviewed research papers within the standard doctoral training period at Makerere University.

- [1] D. Azamuke, M. Katarahweire, and E. Bainomugisha, “MoMTSim: A Multi-Agent-Based Simulation Platform Calibrated for Mobile Money Transactions,” *IEEE Access*, 2024. DOI: [10.1109/ACCESS.2024.3439012](https://doi.org/10.1109/ACCESS.2024.3439012).
- [2] D. Azamuke, M. Katarahweire, and E. Bainomugisha, “MoMTSimDP: A Differentially Private Simulator for Mobile Money Transactions,” in *2025 IEEE/ACM Symposium on Software Engineering in the Global South (SEiGS)*, IEEE, 2025, pp. 53–58. DOI: [10.1109/SEiGS66664.2025.00018](https://doi.org/10.1109/SEiGS66664.2025.00018).
- [3] D. Azamuke, M. Katarahweire, J. Muleesi Businge, S. Kizza, C. Opio, and E. Bainomugisha, “Refining Detection Mechanism of Mobile Money Fraud Using MoMTSim Platform,” in *Pan African Conference on Artificial Intelligence*, Springer, 2023, pp. 62–82. DOI: [10.1007/978-3-031-57639-3_3](https://doi.org/10.1007/978-3-031-57639-3_3).
- [4] D. Azamuke, M. Katarahweire, and E. Bainomugisha, “Financial Fraud Detection Using Rich Mobile Money Transaction Datasets,” in *International Conference on e-Infrastructure and e-Services for Developing Countries*, Springer, 2023, pp. 190–208. DOI: [10.1007/978-3-031-81573-7_16](https://doi.org/10.1007/978-3-031-81573-7_16).
- [5] D. Azamuke, M. Katarahweire, and E. Bainomugisha, “A labeled synthetic mobile money transaction dataset,” *Data in Brief*, vol. 60, p. 111 534, 2025. DOI: [10.1016/j.dib.2025.111534](https://doi.org/10.1016/j.dib.2025.111534).
- [6] D. Azamuke, M. Katarahweire, and E. Bainomugisha, “Scenario-based Synthetic Dataset Generation for Mobile Money Transactions,” in *Proceedings of the Federated Africa and Middle East Conference on Software Engineering*, 2022, pp. 64–72. DOI: [10.1145/3531056.3542774](https://doi.org/10.1145/3531056.3542774).
- [7] D. Azamuke et al., “DeepFakesUG: Detecting Counterfeit Ugandan Banknotes Using Deep Learning,” in *Pan African Conference on Artificial Intelligence*, Springer, 2024, pp. 179–193. DOI: [10.1007/978-3-032-05063-2_7](https://doi.org/10.1007/978-3-032-05063-2_7).

SERVICE

Journal Reviewer

2026 - Present

- Reviewer for Elsevier Journal of Telematics and Informatics Reports.
- Reviewer for Elsevier Journal of Data in Brief.
- Reviewer for Elsevier Journal of SoftwareX.

REFEREES

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Chair, Department of Computer Science, Makerere University.

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