

# Muhammad ALIYU

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## PHD RESEARCHER | ENTREPRENEURIAL ECOSYSTEMS & REGIONAL INNOVATION

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Doctoral student at KU Leuven and Utrecht University, funded by the KU Leuven Research Council and supervised by **Prof. René Belderbos, Asst. Prof. Liudmila Alekseeva and Prof. Erik Stam**. My research will examine how inter-regional flows of knowledge (co-invention), people (founder mobility), and capital (cross-border investment) create **connected entrepreneurial ecosystems**. Prior to my PhD, I completed an MSc in IT-Entrepreneurship at Carnegie Mellon University and led an enterprise AI transformation project that delivered 70–99% efficiency gains across 4 institutional workflows. 8 publications, including peer-reviewed articles, case studies, and preprints under review.

## EDUCATION

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### KU Leuven & Utrecht University

Leuven, Belgium

*PhD, Economics and Business: Entrepreneurship & Innovation*

Jan 2026 — Present

- Supervisors: Prof. René Belderbos & Asst. Prof. Liudmila Alekseeva (KU Leuven) and Prof. Erik Stam (Utrecht University)
- Funded by the KU Leuven Research Council | Expected completion: 2029

### Carnegie Mellon University

Kigali, Rwanda / Pittsburgh, USA

*MSc, Information Technology: IT-Entrepreneurship*

Jul 2023 — May 2025

- Research on African Entrepreneurship Ecosystems | Supervised by Prof. E. Stam, Prof. J. Barros, Prof. J. Thornburg

### Valar Institute

Remote

*MBA, Leadership & Management*

Apr 2023 — Apr 2024

- **Capstone:** Expansion strategy consulting for ‘The Last Taboo’ (financial modelling, market analysis, operational scaling)

### Federal University of Technology Minna

Nigeria

*B.Tech, Computer Science*

Jul 2015 — Sep 2021

- **Thesis:** “Innovative Courseware Content Conversion for E-Learning Platforms”

## PUBLICATIONS

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### Peer-Reviewed & Published

- **M. Aliyu** and J. Barros, “GenAI Inside: A Practical Methodology for Embedding AI Across Enterprise Workflows,” *IEEE International Conference on Artificial Intelligence × Business (AIXB)*, Laguna Hills, CA, USA, Oct. 1–3, 2025.
- **Aliyu, M.**, Mudasiru, R., & Abdulraheem, T. (2025). “Everything You Do Reflects On Us”: Student Leaders Serving as Informal International Diplomats. *Case Studies in International Education*, 6(2).
- **Aliyu, M.**, Adegbayi, T. T., Olajide, A. G., Ike, C., & Adesanwo, S. A. (2025). Building Global Knowledge Bridges: A Student-Led Library Initiative in Nigeria. *Case Studies in International Education*, 6(2).
- **Aliyu, M.**, Samuel, M., & Mariam, A. (2025). Empowering Student Entrepreneurs: An International Collaborative Network. *Case Studies in International Education*, 6(1).
- Underdue Murph, Y., Sulleman, M., & **Aliyu, M.** (2024). Graduate Engineering Students Navigate Cultural Differences to Design Mobile Prenatal Care App for Rural Africa. *Case Studies in International Education*, 5(1).
- **Aliyu, M.**, Issah, S., Abdulrahman, A., Bakare, Z. O., & Aibinu, M. A. (2021). Learning Management System – Review on the Adoption of Collaborative Tools for Learning. *West African Journal of Open and Flexible Learning*, 9(2), 129–140.
- Aibinu, A. M., Yusuf, H. U., Olatunji, D. E., **Aliyu, M.**, et al. (2021). Orientation and its Significance on Skill Development. *5th International Conference on Future Networks & Distributed Systems (ICFNDS)*, 293–298.

### Preprints & Working Papers

- **Aliyu, M.** & Barros, J. (2025). GenAI Inside: A Practical Methodology for Embedding AI Across Enterprise Workflows. *Accepted Paper / Presented in Conference*
- Esibe, R. N., **Aliyu, M.**, Thornburg, J., Barros, J., & Stam, E. (2025). Generative AI Methodology for Uncovering Entrepreneurial Journeys in Africa. *SSRN* [preprint]. Under review.

## RESEARCH EXPERIENCE

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### Research Associate & Project Manager

Jun 2025 — Dec 2025

Mobile Edge AI Lab, Carnegie Mellon University *Kigali, Rwanda GenAI in African Policy, Development and Entrepreneurship Unit*

- Co-design and validation of the “GenAI Inside” methodology, a six-step framework for embedding generative AI into enterprise workflows, validated across 4 institutional use cases (visa letters, admissions emails, alumni tracking, faculty tracking) with efficiency gains of 70–99% and measurable ROI (co-authored paper under review).
- Architected and led the deployment of AI workflow automation pipelines using n8n, Python, RAG (LangChain + OpenAI API), and React/TypeScript, processing **400** visa letters (<3 hrs vs. 3–4 weeks baseline), **800** admissions emails (**85%** time reduction), **878** alumni records (**93.1%** coverage in 2 days vs. 2–3 months), and **200** faculty profiles (**99%** faster).
- Conducted comparative ecosystem analysis across 4 African markets (Egypt, Nigeria, Kenya, South Africa), synthesising academic literature and policy documents to identify structural factors behind the underperformance of VC-backed startup models.
- Built and deployed a conversational RAG system (“African AI & ICT Strategies Chatbot”) enabling real-time querying of national AI/ICT policy documents from 3 countries (Kenya, Nigeria, Rwanda).
- Led a 4-person intern team delivering AI-powered operational solutions for CMU-Africa, completing **4** high-impact automation initiatives within 6 weeks from a pipeline of **60+** identified opportunities.

### Graduate Research Assistant

Jun 2024 — May 2025

Mobile Edge AI Lab, Carnegie Mellon University

*Kigali, Rwanda*

- Co-authored a methodological paper on RAG-based analysis of entrepreneurial journeys across 6 African-owned unicorns; preprint published on SSRN (Abstract #5184838).
- Co-developed a multimodal RAG pipeline (OpenAI API) ingesting data from YouTube transcripts, podcast episodes, and industry reports for systematic founder journey analysis.
- Developed systematic inclusion/exclusion criteria for biographical data analysis across 8 African-owned unicorns, establishing a replicable methodology for qualitative-computational research.

### Research Fellow & Project Manager

Nov 2019 — Apr 2022

Advanced Engineering Innovation Research Group (AEIRG), FUT Minna

*Nigeria*

- Led a 4-person multidisciplinary team on the Intelligent Mining Surveillance System (IMSS) project; results presented at the 2020 AI4CE Symposium (Silver Medal).
- Co-managed operations and part implementation of a **£155,465** Royal Academy of Engineering grant (AI for Clean Energy), coordinating cross-functional teams and producing 200+ LMS and communication assets across a 2.5-year programme.

## TEACHING EXPERIENCE

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### AI Governance Facilitator

Apr 2025 — Oct 2025

European Network for AI Safety (ENAS)

- Facilitated two cohorts of a 12-week AI Governance program (BlueDot Impact curriculum) for international professionals covering policy development, risk mitigation, and responsible AI deployment; **95%** participant satisfaction.

### Graduate Teaching Assistant, Foundations of Entrepreneurship

Aug 2024 — Dec 2024

Carnegie Mellon University Africa

*Kigali, Rwanda*

- Independently delivered 3 lectures and designed tutorial materials for CMU-Africa’s core entrepreneurship course under Prof. Jesse Thornburg, supporting students through office hours and business model development.
- Co-organised a guest masterclass with serial founder Majd Alaily (3x founder, ex-Google), connecting students with real-world entrepreneurship insights in emerging markets.

## GRANTS, FELLOWSHIPS & AWARDS

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- **KU Leuven Research Council Doctoral Fellowship**, KU Leuven, Belgium (2025–2029)
- **Royal Academy of Engineering Research Grant** (Project Manager role), AI for Clean Energy, £155,465 (2019–2022)
- **Kaduna State Government Research Grant**, STEM e-Literacy Platform (2021)
- **3rd Place, Global Challenge (Education)**, CMU-Africa Innovation Summit (2024)
- **Silver Medal**, DOME Research Exhibition, AI4CE (2021)

## SERVICE & LEADERSHIP

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- **Founding President, Africa Innovators Society**, CMU-Africa (2023–2024). Founded CMU-Africa's first entrepreneurship society; **300+** students across 7 universities; **\$45K+** in sponsorships; **15+** student ventures supported.
- **Founder, Ignite Hub Africa (formerly, Ignite Research Academy)** (2021–2024). Pan-African platform for research capacity development; **460+** members; **3,000+** resources shared; **10+** graduate school prep webinars.
- **Innovation Scout, The FutureList** (2024). Connected early-stage startups in Rwanda with resources and investor networks.
- **Savvy Fellowship Fellow** (2024–Present) | **ForbesBLK Member** (2024–Present)
- **Local Organizer**, African Entrepreneurship Ecosystem Summit | **Mentor**, Africa to Silicon Valley

## TECHNICAL & RESEARCH SKILLS

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- **Research Methods:** Econometrics (panel data, causal inference), patent data analysis (PATSTAT), network analysis, co-invention mapping, mixed methods, RAG/LLM evaluation
- **Programming & Data:** Python (Pandas, NumPy, Scikit-Learn, Matplotlib, Seaborn), SQL (MySQL, MongoDB), Git, LaTeX/Typst
- **AI/ML & Orchestration:** OpenAI API, Gemini API, Claude API, LangChain, RAG pipelines, n8n, Mastra, LM Studio, HuggingFace
- **Analytics & Visualization:** Power BI, Tableau, Microsoft Excel, Airtable
- **Languages:** English (fluent), Nupe (native), Hausa (working), Yoruba (working), French (Beginner)

## PROFESSIONAL AFFILIATIONS

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- [Econometric Society](#)
- [KU Leuven Urban Studies Institute \(LUSI\)](#)
- Association for Computing Machinery (ACM)
- International Communication Association (ICA)
- Nigeria Computer Society (NCS)
- European Network for AI Safety (ENAIS)
- ForbesBLK