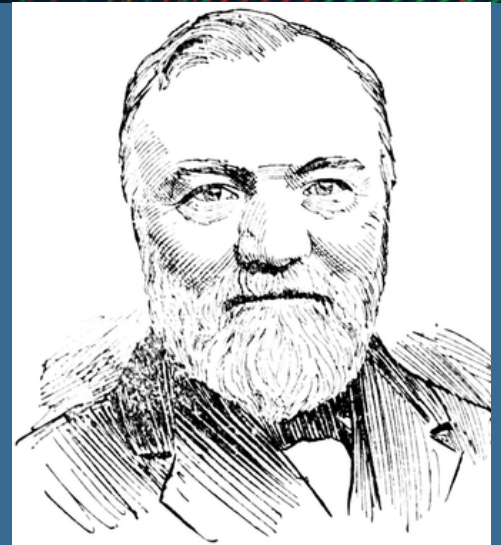**FALL 2025**

CMU RESEARCH CLUB

NEWSLETTER

Carnegie Mellon University Africa

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"My heart is in the work..."

- Andrew Carnegie, 1900

STUDENT RESEARCHER SPOTLIGHT

Name: Miracle James Olotuche (MSEAI'26)
Research Title: Unified Face Attack Detection for Facial Recognition Systems
Lab: Upanzi Network and Vision and Language Intelligence
Advisors: Prof. Assane Gueye and Prof. Moise Busogi
Email: moj@andrew.cmu.edu

As biometric systems power digital identity, authentication, and secure access, ensuring the security of facial-recognition systems is more critical than ever. Miracle James Olotuche is contributing to this effort through her research on Unified Face Attack Detection, tackling both physical attacks (like printed or video replicas) and digital attacks, including AI-generated deepfakes designed to fool recognition algorithms.

Working with Gabriel Zencha Ashungafac, Mukar Wepngong Eleanor, and Blessed Guda under the supervision of Prof. Assane Gueye and Prof. Moise Busogi, Miracle helped develop TSANet, a unified framework capable of detecting both physical and digital face attacks with high accuracy. The framework uses a ResNet-50 backbone with triplet margin loss to structure facial embeddings, combined with Soft Average Classification Error Rate loss to optimize detection based on probabilistic confidence scores rather than hard labels. This approach outperformed state-of-the-art models, even with severe class imbalances, enhancing digital security.

Beyond technical performance, the research emphasizes fairness and inclusivity, using datasets spanning multiple ethnic groups including African, East Asian, and Central Asian so the model generalizes across demographics. The team is now expanding from still-image detection to real-time video-based attack detection, moving closer to deployment-ready anti-spoofing solutions for everyday biometric systems.

Miracle's interest in computer vision was sparked by the Applied Computer Vision course, inspiring her to tackle real-world safety challenges.

Miracle's reflection on her experience:

"Moving from theory to real-world applications has been incredibly enlightening. Understanding the core concepts is essential, as it gives you the tools to solve real-world problems."

Miracle credits her advisors and collaborators for their mentorship and teamwork throughout the process.

STUDENT RESEARCHER SPOTLIGHT

Name: Marion Kipsang (MSEAI'26)
Research Title: AI-Informed Approaches to Contraceptive Access and Counselling in Rwanda
Lab: Spatial and Language Technologies Lab
Current Research: Language and Data-Driven AI for Health Equity
Advisor: Prof. Prasenjit Mitra
Email: mkipsang@andrew.cmu.edu

Marion Kipsang's research explores how artificial intelligence can improve access to contraception and reproductive counselling in Rwanda, particularly for adolescents, unmarried women, and rural populations. Despite national progress in family planning, barriers such as misinformation, stigma, privacy concerns, and stock-outs continue to limit reproductive choice.

In Professor Mitra's lab, Marion applies a Barrier–AI Opportunity Mapping framework to identify regions and service points facing recurring access challenges and to align these barriers with feasible AI-driven solutions. Through this work, two promising approaches were identified: predictive analytics to forecast contraceptive stock-outs and improve supply-chain reliability, and natural language processing (NLP) tools, including multilingual chatbots, to provide culturally sensitive, guideline-aligned contraceptive counselling.

Currently, Marion's research is focused on the development and evaluation of AI-supported contraceptive counselling tools.

Her work combines literature reviews, stakeholder interviews, survey data, and early prototyping with community-health workers (CHWs) under The Challenge Initiative (TCI). The goal is to make contraception more reliable, inclusive, and youth-friendly, supporting gender equity, education, and maternal health.

Marion's passion for healthcare innovation began in Prof. Carine's Malaria Lab, where she applied geospatial mapping to malaria data. That experience inspired her to use AI to address broader health challenges affecting women and families. She emphasizes cross-disciplinary collaboration, ethical engagement, and translating technical solutions into real-world public-health impact.

Marion's comment for other aspiring student researchers:

"Start with a real local problem. Talk to communities. Impactful AI isn't about the coolest algorithm; it's about context, trust, and sustainability."

Marion credits Prof. Mitra for mentorship and guidance in outreach, and appreciates Rwandan students at CMU-Africa for their insights on community engagement.

ALUMNI SPOTLIGHT

Gabrial Zencha, MSEAI'2024

Gabrial Zencha is a Research Associate at Carnegie Mellon University Africa, where he works in the Vision and Language Intelligence Group. His research spans Speech Recognition, Natural Language Processing, and Computer Vision, with a focus on robust and real-world AI systems. He earned his Master's degree in Engineering Artificial Intelligence from Carnegie Mellon University Africa in May 2024, following a Bachelor's degree from TED University in Ankara, Turkey. His work has appeared in leading venues and workshops associated with conferences such as ICLR, ICCV, and ACL-family conferences. Gabrial is scheduled to give an oral presentation at the International Joint Conference on Natural Language Processing and the Asia-Pacific Chapter of the Association for computational Linguistics (IJCNLP-AACL 2025), to be held December 20–24, 2025, where he has work accepted in both the main conference and the Findings track.

This December, the CMU-Africa Research Club sat with Gabrial to get his views on research

What problem space are you most excited about right now, and why?

I am excited about building robust, domain-aware perception systems for speech and vision, especially in low-resource, high-stakes settings. This includes face anti-spoofing, robust object detection, and African-accented low-resource automatic speech recognition. What unites both areas is robustness, designing systems that work reliably under changing conditions, unseen users, and real-world noise. It's compelling because it challenges assumptions about data balance, evaluation, and generalization.

How did CMU-Africa shape your approach?

CMU-Africa instilled technical rigor while emphasizing real-world constraints. Working on vision and speech tasks highlighted the importance of careful problem formulation, dataset design, and evaluation. The environment encourages questioning generalization across new cameras, accents, domains, or limited infrastructure. It also fosters interdisciplinary collaboration, training me to bridge research with deployment-focused thinking.

Advice for students and early-career researchers aiming to publish at top conferences:

Treat research as an iterative process. Start with a well-scoped, meaningful problem grounded in real failure cases. Make evaluation and robustness analysis central—solid baselines, cross-domain experiments, and stress tests are critical. Use workshops for feedback, discuss ideas with peers, and refine submissions before main conferences. Consistency matters: write regularly, read widely, and view rejection and failed approaches as learning opportunities to improve over time.

Gabrial at the ICCV Conference 2025 in Hawaii

Celebrating Professor Emily Aiken

Professor Emily Aiken is an Assistant Professor at the University of California, San Diego (UCSD). She holds a PhD and MS degree from UC Berkeley, and a BA from Harvard University, all in Computer Science. Her research bridges data science and development economics, using large-scale digital traces to inform the design and targeting of social protection and humanitarian aid programs.

In 2024–2025, Professor Aiken served as a Postdoctoral Scholar at CMU-Africa, where she taught **Mobile Big Data Analytics and Management** in Spring 2025. A central feature of the course was a collaborative, publication-oriented group research project. Under her mentorship, some students developed their coursework into peer-reviewed publications and international conference presentations, including the works listed below.

- Unmasking COVID-19 Vulnerability in Nigeria: Mapping Risks Beyond Urban Hotspots (**NeurIPS WiML Poster**)
- Optimizing Healthcare Facility Distribution in Rwanda: A Data-Driven Approach (**European Journal of Public Health**)
- Mapping Socioeconomic Air Quality Disparities in Rwanda Using Sentinel-5P TROPOMI Data in Google Earth Engine (**MIGARS 2025**)
- A Machine Learning Approach for Detection of Mental Health Conditions and Cyberbullying from Social Media (**AAAI AIMedHealth Bridge; to appear in PMLR**)

Beyond the classroom, Professor Aiken actively mentored the CMU-Africa Research Club, leading a hands-on workshop and providing feedback at the Spring 2025 Student Research Showcase, with several student projects later published. She received an Afretec Seed Grant for research on privacy and mobile money in Sub-Saharan Africa and will resume her role as an assistant professor at UC San Diego in Spring 2026.

**Prof. Aiken At the Spring 25 Research Showcase (left) and Poster Workshop (right)**

PhD Opportunities

Are you a recent graduate of CMU-Africa, or you are in the second year looking for PhD opportunities?. Here are some of the best fully funded opportunities for you to pursue PhD in the US and Europe.

1. The University of North Carolina at Chapel Hill PhD in Data Science. Application link - Apply here. Deadlines: Jan. 15, 2026: Priority deadline and Feb. 10, 2026: Final deadline
2. King Fahd University of Petroleum & Minerals - KFUPM, PhD in Industrial and Systems Engineering. Successful applicants contribute to cutting-edge research at the intersection of Industrial AI, data science, and optimization. Application link - Apply here. Deadline: 10 Jan 2026
3. Manchester Metropolitan University. PhD in Computing & Digital Technology. Application Link - Apply here. Deadline: 27 February 2026
4. Bangor University. PhD in Artificial Intelligence and Intelligent Agents. Application link - Apply here. Deadline - End of June, 2026
5. University of Leicester, PhD in Computer Science. Application Link - Apply here. Deadline - They have intakes in January, April, July and September each year, but recommend application at least 5-6 months before the proposed start date for international applicants
6. University of Tulsa, PhD in Computer science. Application link - Apply here Deadline - February 1. Description - here
7. CHANGCHUN UNIVERSITY OF SCIENCE AND TECHNOLOGY. Phd in Electrical Engineering, Computer Science,... Application link - Apply here. Deadlines depend on the program.
8. University of Glasgow, School of Computer Science. Different Phd opportunities. Description - here. Application link - Apply here (first create an account and proceed with the Application). Deadline: 31 January 2026.
9. Institute of Science and Technology Austria PhD in various topics like Computer and Data Science. Description: here. Application portal: here. Deadline: January 8, 2026.
10. University of Sheffield, School of Computer Science PhD opportunities. Description: here Application portal: Apply here. Deadline: 15 January, 2026

If you are preparing for a PhD application, the Research Club 2025 PhD Application Series offers recordings and resources available on our website. We encourage you to take advantage of these materials and leverage CMU-Africa support to submit the strongest possible applications.

We wish you the best of luck with your applications!
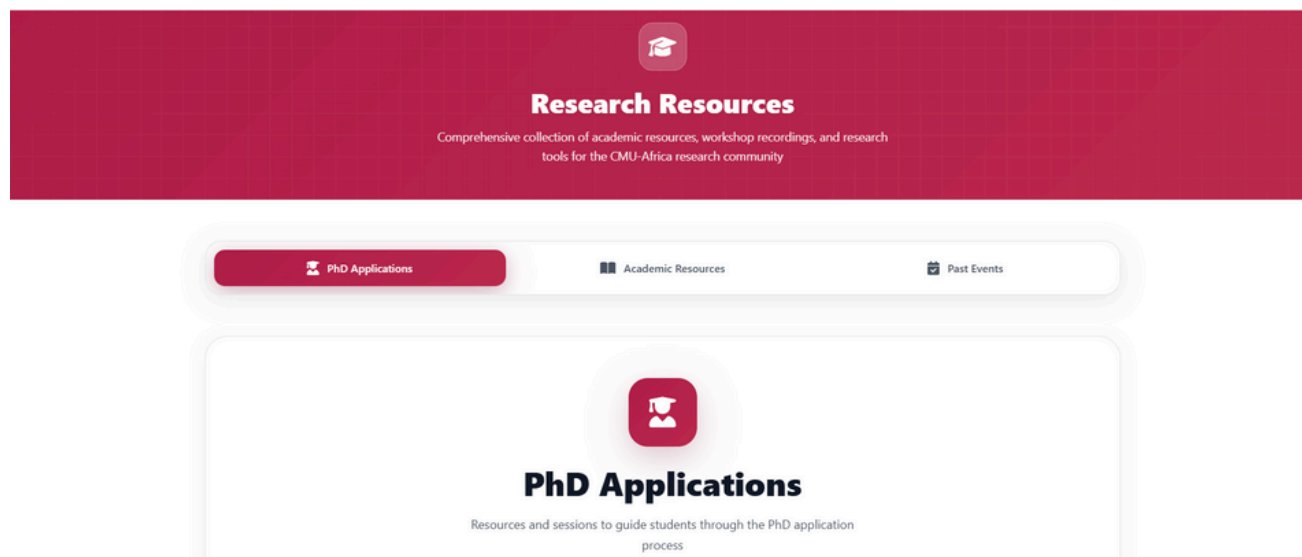
Summary of our Fall 2025 Semester Events

In the Fall 2025 semester, the CMU-Africa Research Club organized a series of events aimed at introducing new students to the research landscape at CMU-Africa and encouraging participation in research-related activities and opportunities.

Your Research Roadmap: Navigating Graduate Research at CMU-Africa (September 4, 2025)

As part of the Fall 2025 Research Club Meet and Greet, Prof. Tim Brown led an interactive session introducing students to research fundamentals, available projects, and best practices for starting a research journey at CMU-Africa.

Panel Session: Students' Perspectives on Research at CMU-Africa (October 3, 2025)

In October, the Research Club hosted a student-led panel discussion featuring Brandone Fonya, Miracle James, Floride Tuyisenge, Chisom Ogbogu, Brian Bosho, and Alex Gichamba, facilitated by Patricia Muraiira. The session highlighted diverse research experiences at CMU-Africa and offered insights from current graduate students on navigating research pathways.

PhD Application Information Session with Faculty (October 10, 2025)

In collaboration with the Academic and Research Ministry, the Research Club hosted a session facilitated by Edward Ajayi, featuring Prof. Tim Brown, Prof. George Okeyo, and Prof. Ismaila Dabo. The speakers shared insights on PhD experiences across UK and US institutions, preparation strategies, publication myths, recommendation letters, and how to leverage the CMU-Africa experience.

PhD Application Series – Part 3: Submitting a Strong PhD Application (November 11, 2025)

In the third and final session of the PhD Application Series, the Research Club hosted Phenyo Moletsane, a PhD student at Carnegie Mellon University's Human-Computer Interaction Institute, who shared practical guidance on preparing competitive PhD applications, including academic CVs, statements of purpose, and engaging recommenders effectively.

Images from some of Research Club events in Fall 2025 Semester
(More pictures on our website)

CMU-Africa Research Club in collaboration with Upanzi Network Hosts First ACM SIGCOMM African Remote PoD

The CMU-Africa Research Club, in collaboration with the Upanzi Network, hosted the first ACM SIGCOMM African remote Point of Delivery (PoD) at the Digital Experience Center, CMU-Africa, from September 8–11, 2025. The event provided a low-cost opportunity for students and the wider community to engage with top-tier networking research through a live remote conference experience. A key highlight was the hackathon - **The African Internet Detective**, where participants analyzed real-world Internet routing data enriched with IP geolocation from ipinfo.io to uncover inefficiencies, bottlenecks, and opportunities to improve connectivity across Africa.

On Day 3 of the conference, **Professor Assane Gueye** delivered a lightning talk, "The Internet from Above: Are LEO Satellites a Revolution or Just Rich People's Wi-Fi?", encouraging participants to innovate for Africa using accessible technologies. The event highlighted the Research Club's commitment to inclusive, research-driven innovation and collaborative solutions for Africa's Internet ecosystem.

Students, faculty, and guests participating in the SIGCOMM Remote PoD at CMU-Africa
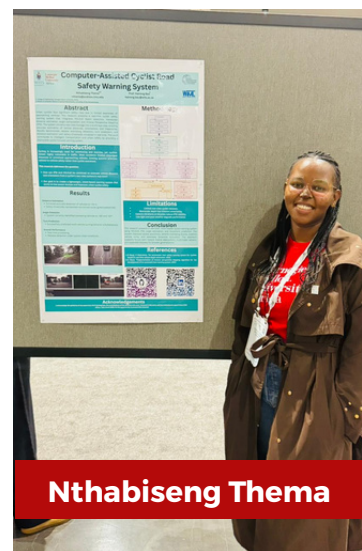
CMU-Africa @ NEURIPS 2025

Oyindamola Olatunji

Ukachi Agnes Eze-Mbey

Sheila Wafula

Nthabiseng Thema

In December 2025, Tartans Grace Kaimburi, Oyindamola Olatunji, Ukachi Agnes Eze-Mbey, Sheila Wafula, Nthabiseng Thema, along with instructor Mikel Ngueajio, represented the CMU-Africa community at NeurIPS. They presented their research and had the opportunity to engage with the broader research community, exchanging ideas and insights at one of the world's premier AI conferences.

Here are the posters presented at NeurIPS:

Computer-assisted cyclist road safety warning system (Poster)

Authors: Nthabiseng Thema
NEURIPS Women in Machine Learning

When Endangered Voices Speak: Building the First Ehugbo Dialect Audio Dataset Through Grassroots Collaboration

Authors: Ukachi Agnes Eze-Mbey
NEURIPS Women in Machine Learning

Unmasking COVID-19 Vulnerability in Nigeria: Mapping Risks Beyond Urban Hotspots

Authors: Sheila Wafula, Blessed Madukoma
NEURIPS Women in Machine Learning

Beyond Data Scarcity: Quality Barriers to Trustworthy AI in Low-Resource Medical Imaging

Authors: Oyindamola Boluwatife Olatunji
NEURIPS Women in Machine Learning

AAAI Conference on Artificial Intelligence 2026

Edward Ajayi   **Baimam Boukar**   **Mona Aman**   **Chol Buol**   **Ahmed Issah**

Tartans Edward Ajayi (MSEAI '26), Baimam Boukar Jean Jacques (MSIT '26), Mona Aman (MSEAI '25), Ahmed Issah (MSEAI '25), and Chol Buol (MSEAI '25) will represent Carnegie Mellon University Africa at the 40th Annual AAAI Conference on Artificial Intelligence, taking place in Singapore in January 2026. Our Tartan researchers have submitted their work to the conference, with some accepted into the AAAI Bridge Program for poster presentations, and others selected for oral presentations. In particular, the AIMedHealth Bridge Program focuses on addressing critical challenges in the effective and safe integration of AI into medical settings. Accepted papers from this track will be published in the Proceedings of Machine Learning Research (PMLR). Students are encouraged to watch out for the 2027 call for papers and submit their work.

Accepted Papers and Presentations (AAAI 2026)

Retrieval with Multiple Query Vectors through Anomalous Pattern Detection (Poster)

Authors: Baimam Boukar Jean Jacques
AAAI 2026 Workshop on New Frontiers in Information Retrieval

A Machine Learning Approach for Mental Health Conditions and Cyberbullying Detection from Social Media (Oral)

Authors: Edward Ajayi, Martha Kachweka, Mawuli Deku, Emily Aiken
AAAI AI in Medicine and Healthcare

Bridging the Gap in Malaria Diagnostics: An Attention-Centric YOLO Framework with Species-Specific Augmentation for Tiny Parasite Detection in Low-Resource Settings (Poster)

Authors: Ahmed Tahiru Issah, Carine Mukamakuza
AAAI AI in Medicine and Healthcare

A Systematic Comparison of Data Representations for Transformer-Based ECG Arrhythmia Classification (Poster)

Authors: Mona Aman, Godbright Nixon Uiso, Carine Mukamakuza
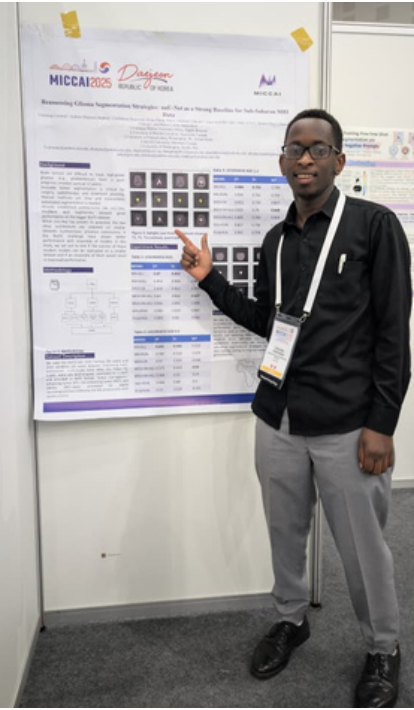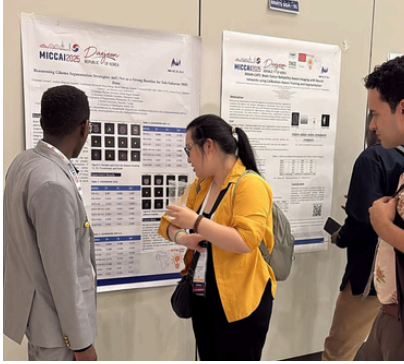**AAAI AI in Medicine and Healthcare**

Architecture-Aware Explainability in ECG Analysis: A Case Study of Aortic Stenosis Detection with ResNet18, LSTM, and ViT-MAE ECG (Poster)

Authors: Chol Buol, Julius Zannu, Carine Mukamakuza, Olatunji Damilare Emmanuel, Vijayakumar Bhagavatula
AAAI AI in Medicine and Healthcare

The 40th Annual AAAI Conference on Artificial Intelligence
JANUARY 20 – JANUARY 27, 2026 | SINGAPORE

CMU-Africa @ MICCAI 2025

Lowami Uwimana and Bernes Atabonfack at MICCAI 2025

Ahmed Issah with his poster at MICCAI 2025

As part of SPARK Academy 3.0, CMU-Africa students Andrew Stephen, Lowami Uwimana, Bernes Lorier Atabonfack and others participated in a six-month training program in Deep Learning and Medical Imaging. The program strengthened participants' technical skills, enabled collaboration with domain experts, and supported efforts to advance healthcare innovation in Africa.

As a major outcome of the program, the students produced two outstanding research papers, both accepted and presented at the 28th International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI 2025), held from September 23–27, 2025, in Daejeon, Republic of Korea. Through MICCAI, students engaged with leading biomedical scientists, engineers, and clinicians across the medical imaging and computer-assisted intervention community.

Here are the posters presented at MICCAI:

Empowering Medical Equipment Sustainability in Low-Resource Settings: An AI-Powered Diagnostic and Support Platform for Biomedical Technicians

Authors: Bernes Lorier Atabonfack, Ahmed Tahiru Issah, Mohammed Hardi Abdul Baaki, Clemence Ingabire, Tolulope Olusuyi, Maruf Adewole, Udunna C. Anazodo, and Timothy X Brown
International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2025)

Reassessing Glioma Segmentation Strategies: nnU-Net as a Strong Baseline on Limited Sub-Saharan MRI Data

Authors: Uwimana Lowami, Andrew Blayama Stephen, Confidence Raymond, Dong Zhang, Maruf Adewole, Udunna C Anazodo, Mehmet Kurt, Damilare Olatunji, and Bernes Lorier Atabonfack
International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2025)

One of the Presented papers will be published at Brain Tumor Segnentataion (BRATS) Proceedings and the other paper will be published at Lecture Notes in Computer Science (LNCS) Series, Springer

CMU-Africa @ Deep Learning Indaba 2025
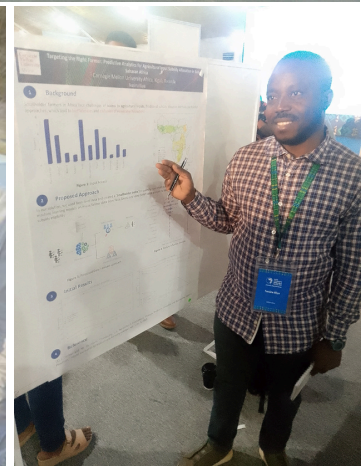
Ukachi Agnes Eze-Mbey presenting a paper and poster at Deep Learning Indaba 2025; Nasiru Iliya presenting a poster at the conference.

In August 2025, CMU-Africa students participated in the Deep Learning Indaba Conference in Kigali, Rwanda, where they showcased their accepted research through paper and poster presentations. Deep Learning Indaba 2025 brought together over a thousand participants from across Africa and beyond, reaffirming its commitment to showcasing and amplifying leading AI research from the continent.

Here are the posters presented at Deep Learning Indaba:

Ehugbo Ka! Advancing Machine Translation for the Low-Resource Ehugbo Language through Parallel Corpus Development.

Authors: Ukachi Agnes Eze-Mbey, Uloma Calista Eze-Mbey, Ololade Anjuwon
Deep Learning Indaba (DLI) 2025

Targeting the Right Farmer: Predictive Analytics for Agricultural Input Subsidy Allocation in Sub -Saharan Africa

Authors: Nasiru Iliya
Deep Learning Indaba (DLI) 2025

Accelerating Medical Image annotation: A Model-Assisted Labeling pipeline leveraging Yolov8 and SAM

Authors: Paul Okwija Mugume, Andrew Katumba, Ronald Omoding
Deep Learning Indaba (DLI) 2025

Some other students also presented their posters during the Deep Learning Indaba Conference however, the details are not available at this time

IEEE Conferences

In 2025, CMU-Africa students were highly active participants in IEEE conferences, highlighting the value of student engagement in these professional communities. A total of 10 papers were accepted and presented at IEEE conferences this year, with contributions from students in the Class of 2025 and Class of 2026. Below is the list of IEEE papers presented this year, all of which will be published on the IEEE platform.

Chisom Ogbogu at IEEE IMAS Conference 2025

IEEE Papers and Presentations 2025

Humidity Inference with Geographic Features and Machine Learning for Enhanced Contrail Prediction for African Airspace (Poster)

Authors: Alice Mugengano, Baimam Boukar Jean Jacques, Jonathan Kayizzi, Moise Busogi
International Conference on Machine Intelligence for GeoAnalytics and Remote Sensing (MIGARS)

Mapping Socioeconomic Air Quality Disparities in Rwanda Using Sentinel-5P TROPOMI Data in Google Earth Engine (Publication)

Authors: Baimam Boukar Jean Jacques, Kamikazi Ndayizeye Raissa, Umubyeyi Evelyne, Bertinn Ndahayo Singizwa, Emily Aiken
International Conference on Machine Intelligence for GeoAnalytics and Remote Sensing (MIGARS)

Particle Swarm Optimization for Dispatch Scheduling of Renewable Energy in Rwanda (Poster)

Authors: Chisom Ogbogu, Marion Kipsang, Jesse Thornburg
IEEE PES/IAS PowerAfrica

Phasor Measurement Integration in Wireless Power Transfer Systems for Grid Applications

Authors: Chisom Ogbogu, Kipngeno Koech, Jesse Thornburg
IEEE MTT-S/AP-S International Microwave and Antennas Symposium (IMAS)

Modeling of Hybrid Geothermal-Solar PV Power Generation in Uganda

Authors: Akabway Rurangwa, Jesse Thornburg
IEEE Southern Power Electronics Conference (SPEC 2025)

KG-Rank-Plus: Enhancing LLM-Based Medical Question Answering with Multi-Hop Knowledge Graph Traversal and Ranking Techniques

Authors: Ahmed Tahiru Issah, Idaya Seidu, Emmanuel Amankwaa Adjei, Mona Aman, Azizuddin Ahmed Biyabani
IEEE AFRICON Conference 2025

Techno-Economic Analysis of Solar PV and Grid Integration for Electric Vehicle DC Fast Charging in Uganda

Authors: Ian Ahereza, Jesse Thornburg
IEEE Transportation Electrification Conference and Expo – Asia Pacific (ITEC-AP)

IEEE Conferences (Cont'd)

IEEE Papers and Presentations 2025

Eyes and Ears: Automated Annotation of Audio Data Using Computer Vision

Authors: Galane Basha Namomsa, Alex Gichamba, Brian Ebiyau, João Barros
IEEE International Conference on Image Processing (ICIP)

Strategic PMU Deployment for Grid Observability and Stability: First Deployment in Rwanda

Authors: Rock Agon, Jasper Kwizera, Dieudonne Iradukunda, Ateny Aguto, Barry Rawn
IEEE PES Innovative Smart Grid Technologies (ISGT)

Automated and Accessible Leukemia Detection from Microscopic Blood Films Using YOLO and Vision Transformers

Authors: Andrew Blayama Stephen, Miracle James Olotuche , Mona Aman, Azizuddin Ahmed Biyabani
IEEE AFRICON Conference 2025

CMU-Africa Students at IEEE Conferences

Journal Publications and Other Conferences

In 2025, Tartan researchers Chisom Ogbogu, Brandone Fonya, Nchofon Tagha Goghomu, Michaella Rugumbira, and Irene Busah also published their work in various academic journals. David Nkundineza presented his paper at AfriCHI 2025, while Miracle James and Eleanor Wepngong co-authored a paper accepted at ICCV. Additionally, Kipngeno Koech co-authored a paper presented at the International Conference on Digital Signal Processing.

David Nkudineza @ AfriCHI 2025

Journal Publications

Optimizing healthcare facility distribution in Rwanda: a data-driven approach

Authors: Brandone Fonya, Nchofon Tagha, Michaella Rugumbira, Irene Busah, Emily Aiken
European Journal of Public Health

Smart Grid Fault Mitigation and Cybersecurity with Wide-Area Measurement Systems: A Review

Authors: Chisom E. Ogbogu, Jesse Thornburg and Samuel O. Okozi
Energies

Simulation of PEM Electrolyzer Power Management with Renewable Generation in Owerri, Nigeria

Authors: MacMatthew C. Ahaotu, Chisom E. Ogbogu, Jesse Thornburg and Isdore Onyema Akwukwaegbu
Energies

Other Conferences

TSANet: Unified Face Attack Detection via Triplet Embedding and Soft ACER Loss

Authors: Gabrial Zencha Ashungafac, Miracle James Oloutuche, Mukar Wepngong Eleanor, Blessed Guda, Assane Gueye, Moise Busogi
IEEE/CVF International Conference on Computer Vision

Evaluating User Experience of Government and E-Government Services: A technology-neutral ecosystem lens

Authors: Timothy Brown, David Nkundineza
Africhi '25: Proceedings of the 5th Biennial African Human Computer Interaction Conference

Improving SSVEP BCI Spellers with Data Augmentation and Language Models

Authors: Joseph Zhang, Ruiming Zhang, Kipngeno Koech, David Hill, Kateryna Shapovalenko
International Conference on Digital Signal Processing

Advanced Academic Skills - Fall 2025

In the Fall 2025 semester, some Class of 2027 students enrolled in the Advanced Academic Skills course taught by **Prof. Kwan Lee** to strengthen their academic writing and develop essential research communication skills. Through the course, students built competencies in critical reading, academic writing, presentations, and research methods, including quantitative and qualitative survey design. For many, the class provided their first exposure to research, as they worked on individual projects addressing issues relevant to the CMU-Africa student community. Joel Maison is the teaching assistant for the course.

As part of the course, students presented digital posters showcasing their work on campus, with fellow students, staff, and faculty in attendance to engage with and celebrate their research.

Below are some of the research topics presented during the course.

Promoting Openness and Support for Mental Health at CMU-Africa

Author: Uwayo Neeve Celia (MSIT '27)

Mental Health and Academic Performance at CMU-Africa: Balancing Academic Pressure and Student Wellbeing

Author: Gentille Uwera (MSIT '27)

Bridging the Engagement Gap: An Analysis of Teaching Methods at CMU-Africa

Author: Mariamawit Gashahun Arega (MSECE '27)

Degree Planning Rollercoasters; Investigating Barriers in Strategic Course selection among CMU Africa Students

Author: Raissa Leinyuy Kinkoh (MSIT '27)

Do I Belong? Exploring the Interplay Between Mental Health, Faculty Support, and Academic Excellence Among Students at CMU-Africa

Author: Jonathan Simenya (MSIT '27)

Overwhelmed but strong: Academic pressure, stigma and mental health support gap in CMU-AFRICA

Authors: Sangwa Michel Briton (MSIT '27)

Overworked and Under-involved: Unlocking the Co-curricular Paradox at CMU-Africa

Authors: Theophilus Kibiwot (MSIT '27)

The Role of Peers in Shaping Mental Wellbeing at CMU-Africa

Authors: Lynne Chepkwony (MSIT '27)

TA's Comment about the class

"Throughout the semester, the students demonstrated remarkable dedication, curiosity, and a genuine commitment to giving back to the CMU–Africa community by using research to address student wellbeing, enhance teaching effectiveness, and foster campus engagement."

Course Instructor: Prof. Kwan Lee

Advanced Academic Skills - Fall 2025

Students from the Advanced Academic Skills course presenting their research posters at the end of Fall 2025 semester

# Explore the Research Club Website

In October 2025, the CMU-Africa Research Club launched its website to give members of the CMU-Africa community a window into our activities, available student resources, and the exciting research and events led by our students.

Sections to explore include:

- **Resources:** Recordings, slides, and shared materials from past events—all in one place so you don't miss out.
- **Conferences:** Stay up to date with upcoming conferences and open calls for research submissions.
- **Projects:** Explore research projects by CMU-Africa students, with new entries added as they become available.
- **Newsletters:** Catch up on previous Research Club newsletters you may have missed.

We encourage you to explore the website and share your feedback with us through the feedback form. We would love to hear from you!
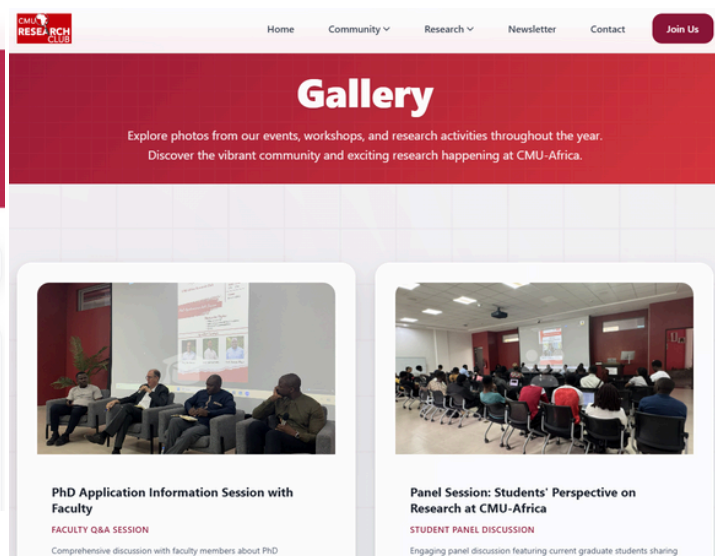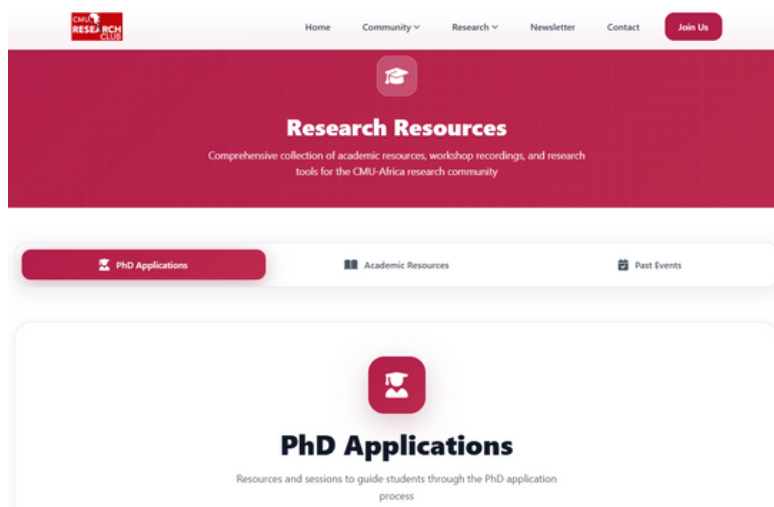
Check out more exciting contents from our website

researchclubcmuafrica.github.io

RESEARCH OPPORTUNITIES AT CMU-AFRICA

At CMU-Africa, every student engages in research through assignments, course projects, reports, and more. In essence, we are all researchers. Here are some resources and opportunities to help you get started and excel in research:

1. Research Methods in Engineering Course: Your journey begins with this foundational course, offered in both Fall and Spring semesters.
2. Join Research Groups: Explore opportunities to volunteer or intern with various research groups during the summer. These experiences provide hands-on exposure to cutting-edge projects.
3. Research Track for MSIT Students: IT students can opt for a dedicated research track designed for students interested in pursuing a research career or a Ph.D. after their program.
4. Independent Study or Engineering Research Project: Students can also undertake independent study or research project which offers a way to engage in research while earning course units. Reach out to the academic advisor for guidance on this option.
5. The Department of Electrical and Computer Engineering CMU-Pittsburgh also has open research opportunities for students. More information here.
6. CMU Africa, Libraries Research Guide here.
7. Learn more about CMU Africa research here.

For more opportunities, reach out to the Research Club officials.

Available

Digital Foundations for Sustainable Transportation

WE WILL GAUGE THE APPLICABILITY OF VARIOUS INTELLIGENT TRANSPORT / E-MOBILITY SYSTEMS IN DIFFERENT SOCIO-ECONOMIC CONTEXTS.
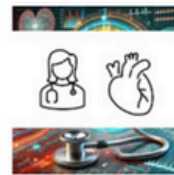
PROJECT DETAILS →

Available

Digital Malaria Control for the Developing World

THE PROJECT EMPLOYS MACHINE-LEARNING CLASSIFICATION METHODS ON MICROSCOPIC IMAGES OF BLOOD SMEARS TO DETECT MALARIA PARASITES AND MIXED INFECTIONS.

PROJECT DETAILS →

Available

Enhanced CVD Discovery in Medically Underserved Communities via AI-assisted Stethoscopy

THIS RESEARCH AIMS TO ENHANCE THE DIAGNOSTIC CAPABILITIES OF ELECTRONIC STETHOSCOPES.
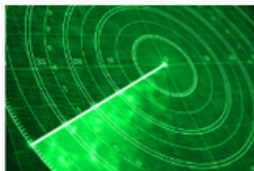
PROJECT DETAILS →

Available

Enhancing Parents' Reporting and Prediction of Adverse Effects following Maternal and Child Immunization in Rwanda through Mobile Application

THIS PROJECT WILL STRENGTHEN VACCINE SAFETY MONITORING AND IMPROVE PUBLIC HEALTH OUTCOMES IN RWANDA.

PROJECT DETAILS →

Available

Evading AI-based Radar Detection

MACHINE LEARNING METHODS HAVE BEEN USED TO DETECT OBJECTS BEHIND WALLS. CAN WE DEVELOP A METHOD THAT WOULD EVADE AI DETECTION?

PROJECT DETAILS →

Available

Leveraging Large Language Models for Enhancing Public Healthcare

WHEN IS IT USEFUL TO USE LLMS TO ADDRESS CRITICAL HEALTHCARE CHALLENGES IN UNDERSERVED COMMUNITIES?
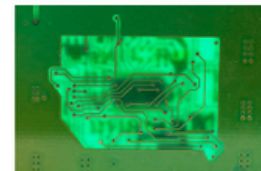
PROJECT DETAILS →

Available

LLMs for Maternal Health Question-Answering and Complications Detection

THE HIGH RATES OF MATERNAL MORTALITY IN AFRICA CAN BE ADDRESSED BY IMPROVING MATERNAL KNOWLEDGE ON OBSTETRIC DANGER SIGNS.

PROJECT DETAILS →

Available

ML-accelerated Prediction of Thermoelectric Semiconductors from Locally Sourced Wolframite

THIS PROJECT WILL MAXIMIZE THE THERMOELECTRIC EFFICIENCY OF WOLFRAMITE MATERIALS AWO(4) USING ML-ACCELERATED ATOMISTIC SIMULATIONS

PROJECT DETAILS →

Appreciation from Outgoing Executives

Dear CMU-Africa Community,

The outgoing executives of the CMU-Africa Research Club would like to take this opportunity to appreciate this incredible CMU-Africa community. We started with a vision to transform the research outlook of students at CMU-Africa, and through your support, we have been able to bring many of these ideas to life.

With your support, we:

- Launched and sustained the Research Club Newsletter
- Completed the PhD Application Series and ran the PhD Student Support Group, providing critical guidance for students pursuing PhD opportunities
- Hosted 11+ events, including the first student-organized and student-led Research Showcase
- Achieved 20+ presentations and publications, with conference participation across three continents in 2025
- Strengthened the research culture and sense of community among CMU-Africa graduate students
- Collaborated with ACM SIGCOMM 2025 and the Upanzi Network to host a remote Point of Delivery (PoD)
- Launched the Research Club website, creating a central hub for resources, opportunities, and updates
- And much more

We acknowledge that all these accomplishments would not have been possible without the collective effort and commitment of the students, staff, and faculty of CMU-Africa. We kindly ask that this same support be extended to the incoming Research Club executives beginning in the Spring 2026 semester.

Let us continue to raise the bar and showcase CMU-Africa to the world.

Thank you, and we wish you a wonderful remainder of 2025.

Signed by: Former Research Club Executives

Edward Ajayi   Angelique Uwamahoro   Joel Adebayo   Stephen Oduh

Have you followed us on our social Media?

The research club has opened our official pages where you will get information about research, opportunities and very insightful contents. Kindly follow us on our LinkedIn page by clicking on the icon below and engage our posts.

CMU-Africa Research Club
Empowering Students to Explore, Innovate, and Transform Africa Through Research
Higher Education · 3 followers · 2-10 employees

Feedback for Research Club

Do you have feedback for us?
- As a student researcher, do you want to share your research?
- Do you have any opportunities you want to showcase on this newsletter?
- Ask a Professor - Do you have a question for faculty you want us to feature on the next newsletter?
- Do you have an Alumni, doing amazing works, you want us to feature?
- Any other suggestions

Scan this QR code or fill the form here

Your feedback is highly appreciated

Enjoy the winter break!

Thank you for reading

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Carnegie Mellon University Africa