

# NEWSLETTER



**Carnegie  
Mellon  
University  
Africa**

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## PhD Application Series: Part 2



On March 5th, 2025, the Research Club hosted Steven Kolawole, a PhD student at the Language Technologies Institute (LTI), Carnegie Mellon University, Pittsburgh. In a deeply insightful session, Steven spoke on building a strong research profile, crafting an impactful Statement of Purpose, writing a compelling Curriculum Vitae, and reaching out to professors whose work aligns with your interests. He candidly shared the lessons he learned from previous application rejections and how those experiences helped him refine his application materials—eventually securing a direct PhD offer from CMU LTI while still completing his undergraduate finals. The session was fully packed with a lot of insights and tips for success. You can watch the recording [here](#) and check out the slides presentation [here](#).

## MARCH-APRIL 2025 EVENTS

### Research Posters Workshop

In April 2025, the Research Club hosted a Hands-on Research Poster Workshop led by Dr. Emily Aiken. The session offered Tartans valuable insights into how to effectively structure a research poster and the key visual elements that contribute to a compelling design. This workshop proved essential in helping students prepare their posters for the Student Research Showcase held at the end of the Spring 2025 semester. To revisit the session, watch the recording [here](#) and review the slides [here](#).



# STUDENT RESEARCHERS SPOTLIGHT

## Ibrahim Jimoh, MSEAI'2025



**Research Topic:** Culturally Sensitive Social Robotics for Africa (CSSR4Africa)

**Supervised by:** Prof. David Vernon

**Email:** ioj@andrew.cmu.edu

**Ibrahim Jimoh (MSEAI Class of 2025)** is actively involved in the **Culturally Sensitive Social Robotics for Africa (CSSR4Africa)** project, led by Prof. David Vernon at the CMU-Africa Robotics Lab. He joined the project as a research intern in Summer 2024 and has since continued as a research assistant and later a research associate at the AI and Robotics Lab.

CSSR4Africa investigates how social robots can be designed and adapted to reflect African cultural contexts, promoting inclusivity and enabling meaningful human-robot interaction. The project focuses on equipping social robots with the ability to interact sensitively and politely using a blend of spatial, non-verbal, and verbal communication modalities.

To embed cultural sensitivity into robot behavior, the team conducted an online survey to gather Rwandan cultural knowledge—focusing on spatial norms, verbal expressions, and non-verbal cues. This knowledge was then structured into a cultural ontology to guide robot interaction in a culturally attuned manner.

In March 2025, Ibrahim and other team members presented their work at the Cultural Robotics: Diversified Sustainable Practices workshop, held during the HRI Conference in Melbourne, Australia. The session sparked engaging discussion around social robotics in diverse cultures and provided valuable feedback from leading researchers.

By the project's conclusion, the team aims to deploy the Pepper humanoid robot in two use-case scenarios: as a lab tour guide in the Robotics Lab and as a campus receptionist—both designed to engage visitors in culturally sensitive and context-aware ways.

**Have a research you want us to feature on our newsletter?  
Reach out today!**

**Ayisha Nuhu (MSECE-AD Class of 2025)** recently presented her research on **Spectral Distortion in Nonlinear Systems**, conducted as part of her Graduate Research Project under the supervision of Prof. Rohrer and Prof. Pileggi. Her work proposes a novel spectral distortion framework for characterizing nonlinear behavior in electronic circuits across the entire frequency spectrum using spectral coefficients. Using a nonlinear RC circuit as a case study, she demonstrated that the method effectively captures both time-domain and frequency-domain responses, showing strong correlation with conventional harmonic and intermodulation distortion metrics.

A key highlight of her research is the formulation of a single mathematical model capable of estimating circuit nonlinearities, eliminating the need to treat harmonic and intermodulation distortions separately. By unifying these two measures, the model simplifies distortion analysis while offering a more comprehensive understanding of circuit behavior. This contribution presents a significant advancement in nonlinear system analysis and offers a promising alternative to existing distortion characterization techniques.

## Ayisha Nuhu, MSECE-AD' 2025



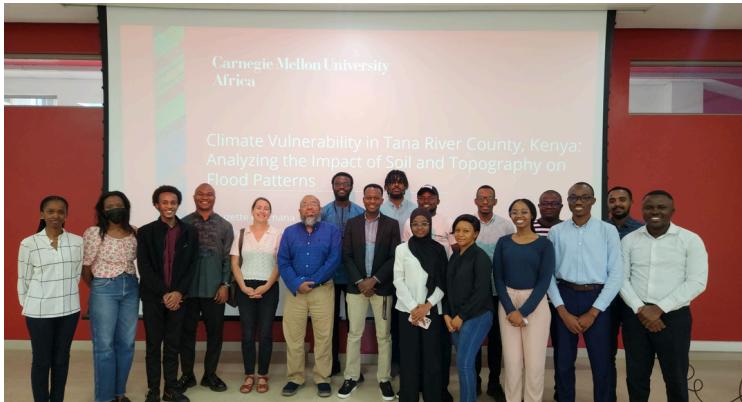
**Research Topic:** Spectral Distortion in Nonlinear Systems

**Advised by:** Professor Ronald Rohrer and Professor Lawrence Pileggi

**Email:** anuhu@andrew.cmu.edu

# STUDENT RESEARCH SHOWCASE - SPRING 2025

On May 6, 2025, the CMU-Africa Research Club hosted the Student Research Showcase, an event where students presented digital posters highlighting research from courses taken during the Spring 2025 semester, including Mobile Big Data Analytics and Management, Applied Computer Vision, Projects in AI for Healthcare, Introduction to Deep Learning, and others. The showcase provided an opportunity for student researchers to receive valuable feedback from faculty, peers, and guests on how to strengthen and advance their work. Below are some pictorial highlights from the event.



# FACULTY RESEARCHER SPOTLIGHT



## Dr. Carine Mukamakuza

Dr. Carine Mukamakuza is a lecturer at CMU-Africa, where she also serves as a researcher and entrepreneur. She holds a Ph.D. from the Vienna School of Informatics at the Vienna University of Technology and a Master's degree from Central South University, China. At CMU-Africa, Dr. Mukamakuza is the Principal Investigator of the AI Healthcare Research Lab, where she leads cutting-edge research in collaboration with the Upanzi Network and the AFRETEC Network to revolutionize healthcare in Rwanda. She teaches courses such as Research Methods in Engineering and Recommender Systems, drawing on her expertise to drive impact both within academia and beyond.

### Chat with Dr. Mukamakuza - Overview

In April 2025, the CMU-Africa Research Club had the opportunity to speak with Dr. Mukamakuza. She shared

insights into her research, current projects and advice for students of CMU-Africa.

#### Can you tell us about your current research? Are there any opportunities for students to get involved? If so, what skills do you expect them to have?

Our lab is dedicated to leveraging artificial intelligence to enhance diagnostic accuracy and provide data-driven decision support for medical interventions, with a particular focus on healthcare challenges in African settings. Currently, our work centers on malaria and cardiovascular diseases, with plans underway to expand into other critical health areas.

We actively welcome student involvement and offer a range of opportunities tailored to different levels of commitment and expertise. These include volunteer positions (ranging from Level 1: 1-2 hours per week for those seeking a general overview, to more involved roles such as Level 4), internships, independent study projects, research assistantships, and research associate positions. Ideal candidates typically have backgrounds in machine learning, data analytics, software development, or biomedical engineering. However, we encourage motivated students from related fields who are eager to contribute to impactful research to reach out as well.

#### Your work focuses strongly on healthcare challenges in Africa. Why?

Yes, our goal is to build context-aware AI solutions that address critical gaps in healthcare delivery and access across Africa. We partner with local institutions to ensure our work is impactful and grounded in real-world needs.

#### What inspired you to center your research on the African health space, particularly diseases like malaria and cardiovascular conditions?

The substantial burden of diverse diseases, coupled with the significant brain drain of healthcare professionals, has made it increasingly urgent to address critical health challenges in Africa. Malaria and cardiovascular diseases, being among the leading causes of death on the continent, underscore the need for innovative solutions. Given the limited healthcare resources, we are motivated to develop cost-effective, data-driven interventions. Our goal is to harness the power of AI to bridge existing gaps in the healthcare system and ultimately save lives.

# FACULTY RESEARCHER SPOTLIGHT - CONT'D

## How do you ensure that your research addresses the specific needs, data limitations, and health disparities faced by African communities?

We prioritize close collaboration with local healthcare providers to ensure our research is grounded in the real-world needs of African communities. By working directly with health institutions in these settings, we engage in co-data collection, which helps us better understand the challenges and constraints unique to the region. This approach allows us to design AI-driven solutions that are not only relevant but also practical, ensuring they can be effectively implemented within the resource limitations that exist.

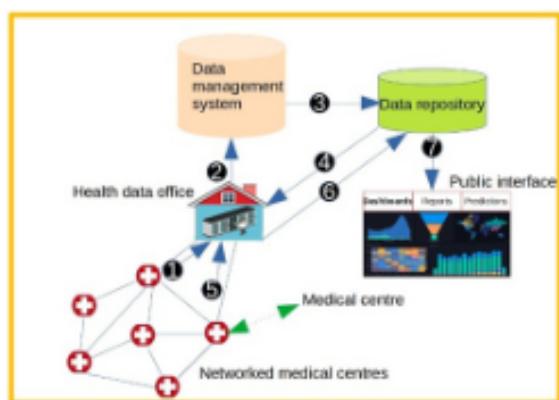
## What advice would you give to students interested in working at the intersection of AI and healthcare in Africa?

Start by understanding the healthcare challenges through field exposure or local partnerships. Combine strong technical skills with empathy and a problem-solving mindset tailored to the African context.

## How can young researchers contribute meaningfully to this research space?

By joining interdisciplinary teams, engaging in collaborative research, and focusing on scalable, locally informed solutions. Contributions can range from model development to deployment and evaluation in clinical settings.

## Curious about how Dr. Mukamakuza is using AI to transform healthcare in Rwanda? Dive into her research and innovations at CMU-Africa.



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** →

[Webpage](#)

[Carine Mukamakuza](#)

[Email Address](#)

[cmukamak@andrew.cmu.edu](mailto:cmukamak@andrew.cmu.edu)

[AI Healthcare Research Lab](#)

[Website](#)

*If you're eager to learn more about Dr. Mukamakuza's research or would love to contribute to the exciting work happening at her AI Healthcare Lab, feel free to reach out using the contact information above.*

# Celebrating Faculty Excellence: A Tribute to Prof. David Vernon

## Reflections on Nine Years of Research, Teaching, and Mentoring at CMU-Africa

Prof. David Vernon is a Research Professor at Carnegie Mellon University Africa (CMU-Africa) in Kigali, Rwanda, where he leads the Robotics Lab and teaches courses in robotics and artificial intelligence. He holds a Ph.D. in Computer Science (1985) from the University of Dublin, Trinity College, Ireland, and has over 40 years of experience in academia and industry. Prof. Vernon has authored and edited several books on computer vision and cognitive systems, including *Machine Vision: Automated Visual Inspection and Robot Vision*, and *Fourier Vision: Segmentation and Velocity Measurement Using the Fourier Transform*. His work has significantly contributed to the development of cognitive architectures and models of autonomy in robotics. At CMU-Africa, he is instrumental in advancing robotics research, mentoring graduate students, and providing technical guidance to the Industry Innovation Lab. His efforts have been pivotal in fostering a culture of innovation and excellence within the institution.



**The Research Club sat down with Prof. David Vernon to reflect on his journey at CMU-Africa—his experiences, values, perspectives, and advice for the student community. One thing we can guarantee: this is a conversation you do not want to miss.**

### Can you start by telling us about your experience at CMU-Africa and looking back, how do you feel?

This year marks my ninth year at CMU-Africa. I first came to Kigali in 2016, during the graduation ceremony. That feels like a long time ago now. These years have been profoundly transformative. I recall one of our earliest Student Guild Town Hall meetings, where we told students something I still believe deeply: the degree is merely a side effect. The real value of the CMU experience lies in how it transforms the individual. It reshapes your approach to problems and equips you with the capacity to tackle challenges in any context. While the acquisition of knowledge is part of the process, the deeper impact is personal. I have come to realize that this transformation does not apply only to students; it has happened to me too. Over these years, I have evolved significantly, not just as an instructor but, I hope, as a person. I have grown in ways I couldn't have anticipated, and that's a direct result of being part of this institution.

One of the things I valued most is CMU's "maker mentality", a culture that insists you must be both a theoretician and a practitioner. You must not only understand concepts but also apply them with real-world precision. That combination is woven into the DNA of CMU, and it's something I will always carry with me. Looking ahead, I do so with gratitude. I can say with conviction that this has been one of the most rewarding periods of my career considering I have worked in many institutions across the world for nearly half a century.

### Looking back on your time at CMU-Africa, what would you say is your proudest contribution?

If I had to highlight one contribution, it would be that I have tried to help students and colleagues recognize the importance of striving toward high standards—consistently and without compromise. I hold myself to those same standards because I see excellence as a shared responsibility; it is, in my view, how strong academic communities grow. I encourage everyone, especially students, to adopt a quality assurance mindset: Am I communicating effectively? Am I being respectful of others' time? Am I clear, concise, and professional in my delivery? It is about thinking before you speak or act, out of respect for those around you. Maintaining consistency in this is essential, as people quickly recognize double standards and may exploit them. That is why I embraced the principle that the same rules must apply to everyone—a value that continues to guide my approach to teaching and leadership. Of course, I do not always meet the standards I set. I fail often; not every paper is accepted. But I keep trying. High standards are aspirational—they do not guarantee success, but they provide direction. With full commitment, success becomes more likely. While living in the UAE, I came across a quote by Sheikh Mohammed bin Rashid Al Maktoum that has stayed with me: "In the race for excellence, there is no finish line." That insight continues to shape how I think about research, teaching, and personal growth. You are not defined by your last paper—you are defined by your next one. If I have helped even a few students adopt that mindset, I consider it a meaningful contribution.

## **Can you share a defining experience that reshaped your approach to teaching and leadership at CMU-Africa?**

Yes, one moment stands out clearly, and it happened just three weeks after I began teaching at CMU-Africa in January 2017. I arrived with a great deal of confidence—perhaps too much—drawing on years of teaching experience in Tatarstan, the Middle East, Ireland, and Italy. I assumed those experiences would translate seamlessly here. But they did not.

Within a few weeks, it became evident that something was not working. I was teaching Data Structures, and the feedback from students was, to be honest, sobering. A delegation from the Student Guild visited my office and said, “We need to talk.” I responded, “Yes, I know it’s not working.” They replied, “Something has to change.” When I agreed, they looked at me and said, “It’s not going to be us.”

That was a turning point. I realized the change had to come from me. It forced me to critically re-examine my teaching philosophy. It was a moment of humility—and profound growth. Since then, I have made a conscious effort to stay open, adaptable, and self-reflective. That experience reshaped my approach to teaching and continues to influence everything I do.

## **What advice would you offer to CMU-Africa students as they continue shaping the future of the African continent?**

Let me start by acknowledging that I am not an African, and I do not claim to be an expert on Africa. Former German President Horst Köhler, a strong advocate for Africa, once began a speech at a state banquet in Kigali, Rwanda, by saying, “Horst Köhler is not an Africa expert.” I have always admired that humility. I believe it is vital for those of us from outside the continent to admit how little we truly understand about the cultures, values, and lived experiences in Africa. What I have learned here—about Ubuntu, about communitarianism—has opened my eyes. But I do not pretend to advise Africans about African problems. That is not my place. I can’t help you identify problems. But I can help you explore the solution space. That is where I can be useful. So here’s my advice, and I offer it to students everywhere, including my own children: hop learning curves. Learning curves are steep at first, then they flatten. When that happens, seek out a new challenge. Find the next curve and climb again. Spend your life staying in that steep zone, where growth happens. That is how you develop as a person, as a scientist, and as a leader. If you live that way, fulfillment will follow. So will leadership, discovery, and impact.

## **As you close this chapter, how do you hope to be remembered by the CMU-Africa community?**

Now, as to how I want to be remembered—I am a future-oriented person. What matters most to me is that students, whether I taught them or not, go on to lead fulfilling, meaningful lives. That they represent the spirit of CMU-Africa in the best possible way. That they embody our DNA: being both practitioner and theoretician, and being capable of navigating complexity with confidence. If that happens—if ten years from now I can look back and see you all thriving—then I will be content. That, to me, would be the greatest outcome of all.

## **Thank you, Professor Vernon. It’s been a privilege. Any final words to close this conversation?**

Yes—just one. Recently, while reviewing a major European research project in cognitive robotics, I noticed something striking. The project coordinator, Prof. Ricardo Sanz—one of the best renowned researchers in the field had something in his email. His signature simply read:

*“Enjoy life.”*

I thought that was beautiful. So I will say the same to you:

*Enjoy life.*

**The CMU-Africa Research Club deeply appreciates all you have done for the student community, both past and present. Your contributions have made a lasting impact, and we sincerely thank you. We wish you a fulfilling journey ahead and hope you continue to enjoy a long, meaningful, and rewarding life.**

**Thank you Professor David Vernon**

# In Their Own Words: Students and Alumni on Prof. Vernon

## A glimpse into the impact of a remarkable educator.



Birhanu Shimelis  
MSEAI 2025

Professor Vernon embodies the standard of professional excellence. His impact on my life extends far beyond academics. It has fundamentally reshaped how I approach challenges and interactions. His philosophies remain etched in my mind: "recommendation is not a recommendation, suggestion is not a suggestion." Through his mentorship, I learned the invaluable lesson of conducting thorough research before seeking guidance, respecting others' time and expertise. Working alongside him, I embraced Kissinger's principle, "Is that the best you can do?" pushing me to consistently exceed my perceived limitations. Professor Vernon didn't just teach material; he established standards of excellence that continue to guide my personal and professional journey.

Professor David Vernon has had a big impact on my academic journey by not only teaching me the technical skills in software and robotics engineering but also showing me how to stay consistent with my goals. He taught us how to manage our time well using weekly timesheets, which helped me balance my workload and is something I now use in my daily life. He also showed me the importance of being professional like respecting people's time, doing proper documentation, and helping others who are struggling which has really shaped how I work and relate with others.



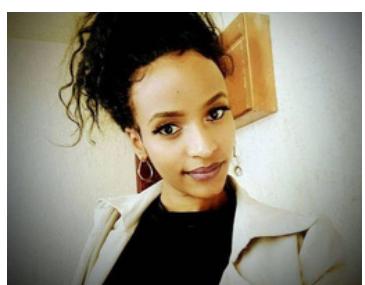
Floride Tuyisenge - MSECE 2026



Jonathan Kayizzi  
MSECE 2026

I joined Prof. Vernon's Data Structures and Algorithms class two weeks late, yet caught up seamlessly thanks to his clear course structure, well-defined learning targets, and elaborate notes. His methodical approach truly distinguished his teaching, prioritizing structured analysis and robust problem-solving frameworks over merely implementing code. Prof. Vernon's impact extended beyond academics into life skills. His lessons on time management were invaluable, sharing his own timesheets and personal experiences balancing work, studies, and marriage. I particularly appreciated how he remained conscious of our workload, ensuring his course maintained a healthy balance with our other responsibilities. His thoughtful approach to teaching both technical concepts and practical life skills has made a lasting impression on my academic journey.

Professor, you've had a big impact on how I think and work. You taught me to question ideas, think deeper, and plan things carefully. I learned a lot of technical skills from you, but also how to be more organized and focused. Before my internship with you, my folders were a total mess random names, no structure, pure chaos. After just two months, everything had a place, and even my desktop looked smarter. You didn't just help me grow as a student, you helped me grow as a person. Wishing you all the best in your next chapter!



Medhn Hadush - MSEAI 2023



Julius Kanneh  
MSECE 2026

Professor David Vernon has deeply influenced my journey in robotics and redefined how I view excellence, work ethic, and professionalism. One of the most magical things about Prof. Vernon is his unique ability to know exactly when to be firm and unapologetically honest to drive a point home, and when to show empathy and guide you through the tough patches in your academic journey. That balance? Rare. Beyond his lectures, I've learned how to ask meaningful questions, communicate clearly, and respect people's time—even in something as simple as sending a concise, zero-context email. Being his student has shaped both my technical growth and my character.

# In Their Own Words: Students and Alumni on Prof. Vernon

## A glimpse into the impact of a remarkable educator.



Melinda Mudzurandende  
MSEAI 2025

Professor Vernon has been one of the most inspiring professors I've encountered at CMU-Africa. While I never worked directly with him on a project, he always supported me whenever I sought his guidance. Beyond academics, we had engaging conversations about AI and robotics, and his insights were always thoughtful and encouraging. He truly values students' perspectives and creates space for meaningful dialogue. He's also been one of my greatest cheerleaders, ensuring my photo with the robot dog was featured on the CMU-Africa homepage and including me in his article on robotics in Africa, giving me global visibility in the robotics space. I'm deeply grateful to have known Professor Vernon before his retirement and hope to stay connected afterward.

Dear Professor Vernon,

Learning from you has been one of the highlights of my time at CMU-Africa. Your integrity in your work is one of the things I keep looking at when seeking fuel to pursue my interests with dedication. It is your commitment to effective and thorough understanding and articulation of the disciplines you pursue that overflows to impact many of your students in realising their potential.

Thank you for all the times you advocated on my behalf and for contributing to my growth in more ways than one. More importantly, thank you for believing in me and giving me the chance to grow into a more productive, reflective, and open-minded individual. For these, and many more, I am forever grateful to you.

May the next phase in your journey bring with it yet more contentment and serenity. I wish you a restful (and fulfillingly productive) retirement!



Arisema Mihretu  
MSIT 2023



Mohammed Danso  
MSEAI 2024

Prof. David Vernon has been an inspiring force at CMU-Africa—his mentorship, intellectual rigor, and genuine care for students have left a lasting impact on many of us. He challenged us to think deeply, encouraged bold ideas, and constantly reminded us of the responsibility we carry as AI researchers and engineers. His work on cognitive architectures and his commitment to advancing AI in Africa will continue to shape our thinking long after his departure. Like many others, he was one of the reasons I chose to join CMU-Africa. A little story: when I first arrived on campus, one of the first people I met was Prof. Assane. I told him about my interest in robotics, and he connected me with Pamely, an intern of Prof. Vernon at the time. Pamely advised me on which courses to take and coached me on how to secure an internship with Prof. Vernon. The rest, as they say, is history. I'm deeply grateful. Thank you, Prof. Vernon, for your vision, your kindness, and your unwavering belief in our potential. Wishing you all the best in your next chapter!

As your time at CMU-Africa comes to a close, I want to express my deep gratitude for the opportunity to learn under your guidance. Your openness, work ethic, clarity of thought, and commitment to meaningful research have left a lasting impact on me. I've learned not just technical skills, but how to ask better questions and approach problems with purpose. Beyond research, your kindness of heart and willingness to listen created a space where we felt supported and encouraged to grow. Thank you for your generosity and the inspiration you've provided. As you begin your next chapter, I hope you take pride in the impact you've made, both in the field of robotics and in the lives of students like me. Thank you for everything.



Ibrahim Jimoh - MSEAI 2025

# In Their Own Words: Students and Alumni on Prof. Vernon

## A glimpse into the impact of a remarkable educator.

As you enter this well-earned chapter of retirement, I want to express my heartfelt gratitude for the profound impact you've had on my academic and personal journey. I will always cherish the perspective I gained through our after-lecture discussions ranging from bit ordering in compiled C programs or exploring the intricacies of cognitive architectures. Your feedback and mentorship across three courses, two independent research projects, an internship, and a Tship played a pivotal role in shaping who I am today. You've helped me become a more effective communicator, a more diligent researcher, a more curious thinker, and ultimately, a better professional.

One of the most enduring lessons I take with me is your "progressive deepening" approach to explaining complex ideas. I've adopted this technique in my own presentations and aspire to replicate the clarity and elegance with which you teach. I have always admired your lifelong commitment to mastering diverse domains within computer science. You are the only person I've met who truly lives up to the phrase: Jack of all trades, master of all. I'm also deeply grateful for the initiative you took to connect me, and many of my classmates, to job and educational opportunities. As you step into retirement, I hope your episodic memory will have to work overtime—because you'll be making so many joyful, laughter-filled moments that it won't know which happy day to replay first. Wishing you nothing but happiness, health, and fulfillment in this new chapter.



Abrham Gebreselasie  
MSECE 2021



Joshua Momo  
MSEAI 2026

Professor Vernon has been amazing. Meeting him was one of my CMU-Africa dreams. He has had so much impact on me in the short time. I can remember the Syllabus for RPP stating there are no late days. I asked myself "Why??". Professor Vernon tries to instill discipline and ethics in his students. He lives by these principles so it only makes sense. I see him come early to seminar talks by other professors, he doesn't take calls or leave during the talks, and pays rapt attention. I've learned (am still learning though) that from him. Also, with all this willingness to instill discipline, he's a Father in every sense of the word. He's genuinely one of the most caring people I've met. He's concerned about how we're doing in other courses and asks whether his course is stressing us more than the 12-hour demand. In addition to this, he's always willing to offer help in the form of advice or surprisingly getting components we needed for our other course when he was traveling. I was surprised that my Professor was willing to get these components for us when he traveled. To make it even more surprising, he seemed more willing to help us get them than we were to get them. Beyond that, he also gave us valuable insights in his office several times for a course he wasn't teaching. I can remember we spent almost 2 hours in his office trying to brainstorm on the challenge we were facing in that other course. He is amazing. Thank you so much, Professor. You've left a mark on me that I'll never forget.

Being taught by Professor David Vernon was a masterclass in excellence. Few experiences compare to learning from someone who not only commands deep expertise but shows up with unmatched preparation, care, and intellectual rigor. He didn't just teach—he modeled discipline, consistency, and an unrelenting pursuit of mastery. Watching him engage with the material, often putting in more effort than his students, taught me—without a single lecture on the subject—the true meaning of professionalism. His brilliance wasn't just in what he knew, but in how generously and passionately he shared it.

Professor Vernon's example lit a fire in me. It will take years to reach the level of mastery he embodies, but thanks to him, I now have a clear vision of the kind of excellence worth striving for.



Ednah Akoth  
MSIT 2026

# Ask a Professor

**What motivates you to teach Introduction to Probabilistic Graphical Models (PGM), and what research opportunities at CyLab are available to CMU-Africa students studying it?**

Introduction to Probabilistic Graphical Models (PGM) offers powerful tools for reasoning under uncertainty. PGMs are particularly effective for unstructured data represented as graphs, where traditional distance-based methods fall short. Unlike black-box models, PGMs are interpretable and model-based, combining probability theory and graph theory to enable efficient inference and decision-making. PGMs also support image reconstruction with diffusion models and phylogenetic inference through flexible tree topologies. Hybrid models like Factor Graph Neural Networks (FGNNs) further combine PGM principles with neural networks for richer message passing and higher-order inference, presenting exciting opportunities for student research at CyLab

- Prof Assane Gueye

## PhD Opportunities for Fall 2025

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. Fully/partially funded PhD position in Robotics and Autonomous Systems at the University of Surrey - [link](#) (Deadline - Variable based on available positions)
2. Fully funded PhD in Artificial Intelligence in Healthcare at Coventry University - [link](#) - (Deadline: May 27, 2025 for September intake)
3. PhD in ECE in Portugal by Carnegie Mellon University - [link](#) (Deadline - Rolling deadline)
4. PhD Research Project in High Resolution Object Detection in Sea Clutter Environment - [link](#) (Deadline - June, 2025)
5. [PhD](#) in Robotics at University of Edinburgh - [link](#) (Deadline - February 2025 but still accepting rolling applications)
6. PhD in Biorobotics 2025-26, Sant'Anna Italy - [link](#) (Deadline - 26 May, 2025)
7. PhD in Transport Engineering and Planning at the University of Edinburgh - [link](#) (Deadline - May 31, 2025)
8. PhD position within the industry-funded Graduate School Intelligent Methods for Testing and Reliability (GS-IMTR) at the University of Stuttgart - [link](#) (Deadline - Rolling till position is filled)

## Fall 2025 PhD Applications - Student Support Group

Are you a CMU-Africa Student, planning to apply for a PhD program starting from the Fall 2025 Application cycle?



**CMU-Africa Research Club is forming a small group where you:**

- Share areas of research interest
- Exchange ideas and application strategies
- Review each other's Statements of Purpose and Personal Statements
- Offer tips on securing application fee waivers
- Prepare for interviews together

**NOTE: Do not join, if you are not planning to apply at this time**

To join the group - Register [here](#) or scan QR Code



# Alumni Corner - Adedayo, Class of 2024

## Adedayo: From CMU-Africa to a Fully Funded PhD in Robotics



### Meet Adedayo Akinade

**Program:** MS in ECE, CMU-Africa

**Class of 2024**

**Current Focus:** PhD in Soft Robotics & Dexterous Manipulation

**Research Interests:** Human-Robot Interaction, Reinforcement Learning, Robotic Grasping & Manipulation

The goal of this interview with our Alumni is to explore how CMU-Africa shaped his research journey—from his time at the Artificial Intelligence and Robotics Lab to becoming a PhD student.

### How was life as a CMU-Africa student?

Life at CMU-Africa was a rollercoaster of emotions—filled with highs and lows. It was my first real exposure to the rigor and hype of machine learning and computer science. Coming from a hardware engineering background, the transition was tough. I initially tried to remain in my comfort zone — robotics was an area of interest but not my area of specialization, so my knowledge was limited. I took courses in robotics during my early semesters and gradually immersed myself in AI and ML. That decision paid off in the long run. The entire transition period was emotionally intense because I had to redefine my academic direction. I became more intentional about what I wanted and selected courses accordingly. Mentorship played a significant role — both from professors and senior colleagues. I learned so much from those who had gone through the system. Also, experienced peers were of help and guided my choices of course and decision making. Even though it wasn't defined mentorship, for me, it was learning from them that was key. Working closely with a professor whose interests in robotics aligned with mine was a turning point. I spent significant time learning both on and off the job, and having that alignment early on made a big difference.

### At what point did you get into the CSSR research project, and how did you become a Research Associate?

One key piece of advice I always give is: prepare yourself ahead of time. There's a constant tradeoff between learning something new and deepening your expertise. You have to know when to do which.

My journey with the CSSR project began in my first semester when I took a course with Prof. Vernon. In my second semester, we had a course on Human-Robot Interaction and began tailoring the content to the African context, where very little research had been done. Prof. Vernon later announced a summer internship opportunity, I applied and got in—that was my first real step into the project. Although I spent only a month with the team and then a semester in Pittsburgh, I returned and rejoined the team. Even my MSc thesis was coined out of the project, so I remained actively involved. When I graduated and found that the project was still ongoing, I reapplied and was accepted as a Research Associate.

### Has pursuing a PhD always part of your plan?

I knew I would pursue a PhD at some point, but initially, my focus was to complete my MSc and take a break. However, every step along the way helped prepare me. From working as a student research assistant for a minimum of 24 hours per week to later doing 37–40 hours as a Research Associate, the experience sharpened my skills and prepared me for doctoral research. I was very intentional about gaining robotics expertise—and I did. As the saying goes, “when preparation meets opportunity success becomes inevitable.”

### What advice would you give to current students interested in research or pursuing a PhD?

Start thinking about PhD options while you're still a student. I wasn't interested in just any PhD—I wanted one that aligned with my goals and gave me clarity from the start, not something I'd figure out along the way. After graduation, I became more serious about it—especially with my PI leaving. I had to make a life decision, and pursuing a PhD became the most viable path. My advice will be to be more focused on learning, and it will pay off in the end as opposed to just chasing grades. During any interview, whether for a PhD or another opportunity, people want to see if you really understand your field. CMU-Africa gives us the foundation. Use it. Spot opportunities early, act on them, and make the most of them. Know what you want and go for it. Be excellent at something. Finally, don't be afraid to volunteer—even with professors. Not all may need it, but some will appreciate the initiative.

# 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.

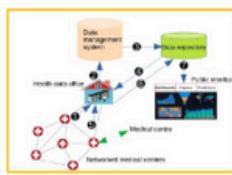


Available

## Digital Foundations for Sustainable Transportation

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

[PROJECT DETAILS →](#)

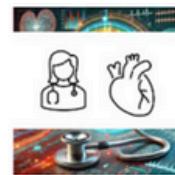


Available

## 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 →](#)

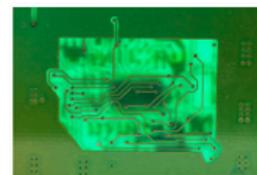


Available

## 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  $\text{WO}_4$  USING ML-ACCELERATED ATOMISTIC SIMULATIONS

[PROJECT DETAILS →](#)

# 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 summer break!

***Thank you for reading***

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