

Shawal Mbalire

Embedded Systems Engineer Hardware and Software

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Kampala, Central Region, Uganda

Professional Summary: Passionate Electrical and Software Engineering student focused on embedded systems, IoT, sustainable technology, and youth-centered digital inclusion. Experienced in designing sensor networks, refurbishing hardware for educational impact, and contributing to telecommunications research and e-mobility initiatives. Strong track record of leadership, research collaboration, and delivering community-impact technology solutions.

Professional Experience

Generation Connect Youth Envoy

Jan 2024 – Present · 8+ mo

International Telecommunication Union · Geneva, Switzerland

- Represented African youth in global telecommunications initiatives
- Participated in ITU strategic planning for digital inclusion
- Collaborated with international stakeholders on digital divide solutions
- Contributed to policy development for youth digital empowerment

Embedded System Intern

June 2023 – Mar 2024 · 10 mo

IoT-ra (Internet of Things - Research & Applications) Lab · Kampala, Uganda

- Designed and implemented 5+ IoT prototype systems
- Developed automated monitoring solutions for agricultural applications
- Created smart home automation systems using wireless sensors
- Contributed to research publications on IoT applications in developing countries

Engineering Intern, E-waste Recycling

Jan 2022 – Nov 2023 · 1 yr 11 mo

netLabs!UG · Kampala, Uganda

- Refurbished 100+ computers from electronic waste
- Provided functional computers to 20+ schools in underserved communities
- Reduced electronic waste by implementing systematic recycling processes
- Trained community members in basic computer maintenance and repair

Chairperson

Jan 2023 – Present · 2+ yr

IEEE Makerere University Student Branch · Kampala, Uganda

- Led a team of 9 executive members
- Organized 15+ technical workshops and training sessions
- Increased branch membership by 150% during tenure
- Established partnerships with 5+ technology companies

Undergraduate Researcher

Sep 2023 – Mar 2024 · 7 mo

The Marconi Research and Innovations Laboratory · Kampala, Uganda

- Contributed to 3 research papers in telecommunications
- Developed novel signal processing algorithms for wireless systems
- Conducted extensive research on wireless communication systems
- Presented findings at 2 international conferences

Engineering, Software Dev & Data Analysis Intern

Mar 2023 – Nov 2023 · 9 mo

Green Hub East Africa Ltd · Kampala, Uganda

- Developed environmental monitoring software solutions
- Analyzed data for 10+ green technology projects
- Created automated reporting systems for sustainability metrics
- Contributed to carbon footprint reduction strategies

Selected Projects

E-waste Computer Recycling Initiative

- Successfully provided 100+ functional computers to schools in underserved communities
- Established systematic process for e-waste collection and sorting
- Implemented quality assurance testing for refurbished systems
- Directly impacted over 2,000 students' access to digital education

IoT Applications Development

- Developed sensor networks for agricultural monitoring
- Created environmental data collection systems
- Implemented wireless communication protocols for remote monitoring
- Currently deployed in 5+ locations providing real-time monitoring

Telecommunications Research

- Developed novel signal processing algorithms for wireless systems
- Conducted extensive simulation and testing of communication protocols
- Contributed to research on 5G and beyond communication technologies
- Research contributed to 3 academic publications

IEEE Research Publication

- Co-authored peer-reviewed research paper in telecommunications field
- Conducted extensive literature review and comparative analysis
- Developed novel approaches to wireless communication challenges
- Publication contributes to global knowledge base in telecommunications

IEEE Student Branch Programs

- Organized 15+ technical workshops and training sessions
- Developed curriculum for Arduino and solar technology training
- Coordinated programming competitions with industry partnerships
- Programs reached 500+ students, improving technical skills

Green Hub E-mobility Research

- Conducted feasibility analysis for electric vehicle adoption in Kampala
- Researched charging infrastructure requirements and placement strategies
- Analyzed economic and environmental impact of e-mobility solutions
- Research findings contributed to policy discussions on sustainable transportation

Education

Makerere University

2022 – 2026

Bachelor of Engineering - BE, Electrical and Electronics Engineering

Mengo Senior School

Feb 2019 – Dec 2021

UACE, Physics Chemistry Mathematics

Mengo Senior School

Feb 2015 – Nov 2018

Uganda Certificate of Education UCE, General

Technical Skills

Programming: C/C++, Python, JavaScript, MATLAB, Verilog

Embedded Systems: Arduino, ESP32, STM32, Raspberry Pi, Sensor Integration, IoT Protocols

Development Tools: Git, Linux Administration, KiCad, MPLAB, VS Code

Engineering: Signal Processing, Wireless Communication, PCB Design

Research & Analysis: Data Analysis, Research Methods, Academic Writing

Leadership: Project Management, Technical Training, Youth Advocacy, Hardware Refurbishment

Certifications & Licenses

Certificate of Completion - Safety Management Systems Professional Certification Comprehensive safety management systems certification focusing on workplace safety protocols and risk management	2024
Machine Learning with Python Technology Certification Machine learning algorithms, data science techniques, and Python programming for AI applications	2024
Introduction to Cybersecurity Security Certification Foundational cybersecurity covering network security, threat analysis, and digital security best practices	2024
ChatGPT API AI/API Certification ChatGPT API integration, natural language processing applications, and AI-powered software development	2024
AI Capstone Project with Deep Learning Artificial Intelligence Advanced AI certification through capstone project, demonstrating expertise in deep learning frameworks	2024

Publications & Research

Wireless Communication Systems Research IEEE Xplore Digital Library Co-authored peer-reviewed research paper on telecommunications and signal processing <i>Published in IEEE conference proceedings</i>	2024
IoT Applications in Agricultural Monitoring IoT-ra Lab Research Publication Technical report on embedded systems for smart agriculture applications <i>Institutional research repository</i>	2024
Sustainable E-waste Recycling Methodologies netLabs!UG Technical Report Documentation of systematic approaches to electronic waste refurbishment and reuse <i>Community impact assessment and methodology</i>	2023

Awards & Honors

ITU Generation Connect Youth Envoy Selection International Telecommunication Union Selected among global youth to represent Africa in telecommunications advocacy	2024
IEEE Student Leadership Excellence Award IEEE Makerere University Student Branch Recognition for outstanding leadership and branch development achievements	2023
Best Innovation Award - E-waste Project netLabs!UG Sustainability Initiative Recognition for innovative approach to electronic waste recycling and community impact	2023
Dean’s List Academic Excellence Makerere University College of Engineering Consistent academic performance in top 10% of engineering students	2022 – 2024

Languages

English: Native/Fluent – Professional working proficiency

Luganda: Native – Local language fluency

Swahili: Conversational – East African regional communication

French: Basic – Academic level understanding

Volunteer Experience

Technical Trainer & Mentor

2022 – Present

IEEE Student Branch Community Outreach

Volunteer technical training for underserved communities in basic electronics and programming

Reached 200+ community members through free workshops

Digital Literacy Advocate

2023 – Present

Community Technology Centers

Promoting digital inclusion through computer literacy programs in rural schools

Established 5+ community technology access points

Environmental Technology Educator

2023

Green Hub East Africa Outreach

Educating communities on sustainable technology practices and e-waste management

Conducted 10+ environmental awareness workshops

References

Professional References

Detailed references available upon request from:

- **Academic Supervisors** – Makerere University Faculty
- **Research Mentors** – IoT-ra Lab & Marconi Research Laboratory
- **Industry Professionals** – ITU Generation Connect & netLabs!UG
- **Community Leaders** – IEEE & Green Hub East Africa

Contact information and detailed recommendations provided upon employer request