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
Bachelor of Engineering - BE, Electrical and Electronics Engineering
2022 – 2026

Mengo Senior School
UACE, Physics Chemistry Mathematics
Feb 2019 – Dec 2021

Mengo Senior School
Uganda Certificate of Education UCE, General
Feb 2015 – Nov 2018

Nabweru Parents Primary School
Primary Leaving Exams PLE
Jan 2010 – Nov 2014

Technical Skills

Top Skills: Mobile Application Development, Application Programming Interfaces (API), 3D Printing

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