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

Certifications & Licenses

Certificate of Completion- Safety Management Systems   2024
Professional Certification

Comprehensive safety management systems certification focusing on workplace safety protocols and risk management

Machine Learning with Python   2024
Technology Certification

Machine learning algorithms, data science techniques, and Python programming for AI applications

Certificate of Completion Introduction to Cybersecurity Bootcamp   2024
Security Certification

Foundational cybersecurity covering network security, threat analysis, and digital security best practices

ChatGPT API   2024
AI/API Certification

ChatGPT API integration, natural language processing applications, and AI-powered software development

AI Capstone Project with Deep Learning   2024
Artificial Intelligence

Advanced AI certification through capstone project, demonstrating expertise in deep learning frameworks

Publications & Research

Wireless Communication Systems Research   2024
IEEE Xplore Digital Library

Co-authored peer-reviewed research paper on telecommunications and signal processing

Published in IEEE conference proceedings

IoT Applications in Agricultural Monitoring   2024
IoT-ra Lab Research Publication

Technical report on embedded systems for smart agriculture applications

Institutional research repository

Sustainable E-waste Recycling Methodologies   2023
netLabs!UG Technical Report

Documentation of systematic approaches to electronic waste refurbishment and reuse

Community impact assessment and methodology

Awards & Honors

ITU Generation Connect Youth Envoy Selection   2024
International Telecommunication Union

Selected among global youth to represent Africa in telecommunications advocacy

IEEE Student Leadership Excellence Award   2023
IEEE Makerere University Student Branch

Recognition for outstanding leadership and branch development achievements

Best Innovation Award - E-waste Project 2023
netLabs!UG Sustainability Initiative

Recognition for innovative approach to electronic waste recycling and community impact

Dean's List Academic Excellence 2022 – 2024
Makerere University College of Engineering

Consistent academic performance in top 10% of engineering students

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