Esther Francis Mtitu

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A highly motivated and detail-oriented engineering student, with foundation in electronics design, embedded systems, and sensor technology, coupled with hands-on experience in PCB design, circuit simulation, and microcontroller programming. My passion for developing innovative solutions in wearable electronics is matched by my acquired skills in electrical measurements and signal processing. With readiness and ability to apply technical skills in real-world scenarios and a commitment to continuous learning, I am eager to contribute to cutting-edge research and development in a collaborative and dynamic environment.

Education

Expected in 2025-12

Bachelor of Science: Electronics and Communication Engineering

University of Oulu - Oulu

- Completed Coursework: 126 ECTS, January 2025
- Completed University-level Coursework: **Electronics and Circuit Design**: Introduction to Electronics, Circuit Theory 1 & 2, Electronic Measurement Techniques, Electrical Measurement Principles, Digital Techniques 1 & 2, Electronics Materials.
- **Embedded Systems & Programming**: Introduction to Computer Systems, Elementary Programming, Introduction to Software Engineering.
- **Networking & Communication Technologies**: Devices and Data Networks, Introduction to the Internet.

2023-05

Basic Engineering studies

China University of Petroleum - Qingdao, China

- Completed Coursework: Electrical measurements principles and techniques, C programming, Calculus, and Chinese language (HSK1), August 2022-May 2023
- Transferred from a one-year Basic Engineering program to the University of Oulu to pursue a strong interest in Electronics and Wireless Communications.

2022-05

High School Diploma

Feza Girls' High School - Dar Es Salaam, Tanzania

- Relevant courses include AP Calculus, Advanced Pure mathematics, Advanced Physics (college physics) and Advanced Chemistry (General, Physical, Inorganic and Organic Chemistry), and Turkish language (Beginner´s level)
- Among the top achievers who received the presidential scholarship award due to first class performance in the country (Tanzania)
- Improvement of English language. IELTS 7.0

Skills

- **Technical skills**

Programming

Developed a functional Minesweeper game using Python language.

Created user interactions for tile selection and game end conditions.

Developed a program that communicates with a server using TCP and UDP protocols, Implemented encryption and error detection, and managed multipart messages for efficient data transmission.

Electronics design

Designed responsive circuits that interact with physical activities using TinkerCad.

Created circuit schematics and PCB layouts using KiCad software.

Simulation and Debugging

Architected and designed a microprocessor CPU core using SystemVerilog, implemented RTL architecture, developed and verified module code, and conducted logic synthesis and Gate-Level Simulation to ensure functional equivalence and performance.

Conducted circuit simulations using LTspice and MATLAB, analyzed electronic circuit performance, and optimized designs for efficiency and reliability.

- **Teamwork and collaboration**

Collaborated with a diverse team to solve problems and analyze data at Startup Weekend Oulu.

Teamed up with peers to represent East African culture at Festival of Culture.

- **Problem-solving**

Participated in hackathons (Hack4Health, Stupid AI, Startupweekend Oulu), enhancing problem-solving and innovative thinking skills.

- **Leadership**

Represented the University of Oulu as a Student Ambassador, promoting the university and supporting student welfare.

Guided prospective students by providing information and

support, enhancing their transition to the University of Oulu.

- **Analytical Skills**

Developed strong analytical skills through participation in the Hack for Health Hackathon.

Analyzed data and problem-solved collaboratively at Startup Weekend Oulu.

Utilized analytical thinking to enhance student engagement initiatives and marketing strategies.

Projects

Computer Systems: Morse Code Communication Device using SensorTag

- **Project Description**: Developed a communication device using the SensorTag board to send and receive Morse code messages. Implemented movement detection using the MPU9250 sensor to translate gestures into Morse symbols, transmitted via UART to a workstation. Designed a minimal user interface with LEDs and a buzzer for feedback.

Elementary Programming: Minesweeper Game in Python

- **Project Description**: Built a Minesweeper game in Python, featuring customizable grid dimensions and mine placement. Implemented tile reveal logic, recursive uncovering of empty tiles, and win/loss conditions. Used provided libraries (sweeperlib.py) and graphics for the game interface.

Introduction to Internet: TCP/UDP Client-Server Communication

- **Project Description**: Created a program to communicate with a server using TCP and UDP protocols. Implemented basic functionality for sending/receiving messages, parsing data, and translating word lists. Added optional features like encryption, parity checks, and multipart message handling.

Digital Techniques 2: Microprocessor CPU Core Design

- **Project Description**: Designed and implemented a 16-bit microprocessor CPU core in SystemVerilog. Developed modules for ALU, registers, and control units. Verified functionality using simulation, synthesis, and formal equivalence checks. Optimized clock frequency and implemented custom instructions like averaging two signed numbers.

Introduction to Electronics: Circuit Design and PCB Development

- **Project Description**: Designed and simulated a circuit in TinkerCad that responds to physical activity. Created a PCB layout using KiCad, including schematic design, copper plane editing, and generating work files for manufacturing.

Portfolio Website Creation using HTML, CSS, and Python

- **Project Description**: Designed and developed a personal portfolio website to showcase projects and skills. Used HTML and CSS for the front-end layout and styling, ensuring a responsive and visually appealing design. Integrated Python for back-end functionality, such as form handling and dynamic content rendering. Deployed the website for public access.