

# Tawedzerwa K. Vhurumuku

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## Education

### Stanford University

Sep 2023 - Jun 2027

*Bachelor's Degree, Electrical Engineering, Computer Science*

- **Coursework:** Accelerated introduction to programming with web development using Python and Javascript, Programming Abstractions in C++, Circuits, RISC-V architecture, assembly language and machine-level code, C language, memory organization and management, Operating systems principles, Digital Systems Design and Verilog, Digital Systems Architecture, Signals and Systems, Mathematical foundations of Computing

## Work Experience

### Machine Learning Research Intern

Apr 2025 - Present

*Exploration of Advanced Memory Architectures & Machine Learning Acceleration*

Stanford, CA

- Explored advanced memory architectures, including gain-cell eDRAM, to enhance machine learning workloads, leading to improved data processing efficiency
- Investigated systolic array accelerators using SCALE-Sim and key literature, which contributed to a deeper understanding of performance optimization in machine learning applications
- Evaluated different LLMs' proficiency in generating Verilog for ASIC design using Human evals, enhancing the accuracy and efficiency of design processes

### Software Engineering/Computer Science Teaching Assistant

May 2025 - Present

*CS 106A/B - introductory data structures and algorithms classes for 900+ students*

Stanford, CA

- Taught weekly sections to students in Python and C++, improving their programming skills and confidence in these languages
- Collaborated with professors and other TAs to create and design lesson plans, assignments, and exams, enhancing student engagement and understanding
- Conducted office hours for debugging help, utilizing skills in C and hardware debugging to improve student problem-solving abilities
- Graded and assessed weekly coding assignments, midterms, and finals, providing constructive feedback to enhance student learning outcomes

### Uncommon.org + Stanford CS for Social Good

Jun 2024 - Aug 2024

*Software Developer Intern*

Harare, Zimbabwe

- Participated in a funded internship program, enhancing skills in web development and professional growth through hands-on projects and mentorship
- Improved the search algorithm of Uncommon's marketplace, developed the blog page full stack, and integrated AI into website features, leading to enhanced user experience and functionality
- Built modal contact forms using Next.js, enhancing user interaction and data collection efficiency

### Netro Electronics Zimbabwe

Jan 2023 - Jul 2023

*Electrical Engineering Intern*

Harare, Zimbabwe

- Acquired electronics design and assembly skills using EasyEDA, enhancing the efficiency of circuit design processes
- Mounted electronic components on boards using Surface Mounting Device (SMD) and Through Hole Technology (THT), improving assembly precision and reliability
- Automated an egg incubator and developed projects for advertising components, which increased product visibility and customer engagement
- Tutored robotics and electronics to primary and high school students, using Arduino C to enhance their understanding and fostered interest in STEM fields

## Projects

### Mango Pi Curtain Opener

- Designed and implemented a bare-metal programming solution in C.
- Wrote drivers for the RTC module and I2C protocol to automate curtain movement based on a clock and timers.
- Added a shell interface for command execution and built a library to integrate an IR sensor for remote control functionality.
- Collaborated with a partner to refine and test the system.

### Personal Blog

- Developed a full-stack blog using Next.js, Sanity, React, and TypeScript to gain mastery in modern web development technologies.
- The project features dynamic content management and a responsive user interface.

### WanderWise — iOS Travel Planner

- Swift app with three tabs: Discover (API powered destinations), Favorites (saved places), and Map
- Includes AI chat assistant travel advice for each destination
- . Focus on networking, data passing, persistence, and a simple clean design

### Sobel Edge Detection in C++

- Single and multithreaded grayscale and Sobel filters optimized with ARM NEON intrinsics for real time performance.
- Increased in performance from 5 FPS to 100 FPS (1900 % increase)
- Benchmarked throughput and latency across cores

### Social Media Flutterer

- Created a web application using JavaScript and Python modeled after Twitter, focusing on real-time updates and user interactions.

## Certifications

- **Intro to IOS development:** Codepath 2025
- **Regeneron ISEF finalist delegate Zimbabwe:** Society for Science 2022
- **Broadcom Foundation Award:** Africa Science Buskers Festival 2022
- **Top Student AS physics in Zimbabwe:** Cambridge University Press & Assessment 2021

## Skills

- C, C++, Python, Web Development (Next.js, Node.js, Sanity.io GROQ, NestJS, Typescript, HTML, CSS, Javascript, Bootstrap, MongoDB, React), Git, Robotics, Electrical engineering, Arduino C, Research, Assembly language, Fast API, Object Oriented Programming, Hardware debugging, Timing analysis, Digital Circuits, FPGA, Machine Learning Acceleration, Operating Systems, Multithreading, RISC -V, Digital Systems Architecture, Swift