Tawedzerwa K. Vhurumuku

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Summary

Experienced intern in system development and machine learning research, with a strong focus on optimizing memory architectures and accelerating machine learning processes to enhance data efficiency and model accuracy. Actively engaged in teaching assistant roles, designing and implementing course materials for over 900+ students, and improving programming skills. Aimed at leveraging technical expertise and teaching experience to contribute effectively in roles requiring advanced computational problem-solving and student engagement.

Education

Stanford University   **Sep 2023 - Jun 2027**

Bachelor's Degree, Electrical Engineering, Computer Science

- **Coursework:** ENGR40M - Intro to electrical engineering, CS106AX - Accelerated introduction to programing with web development using Python and Javascript, CS106B - Programming Abstractions in C++, intro to recursion, Abstract Data types (ADT's), optimization, data structures, EE101A - Circuits I, CS107E - RISC-V architecture, assembly language and machine-level code, C language, memory organization and management, controlling GPIO, graphics, sound, and keyboards, CS111-Operating systems principles, EE 108 - Digital Systems Design and Verilog, EE180 - Digital Systems Architecture, EE102A -Signals and Systems (Signal Processing), 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
- Optimized machine learning execution using Torch Dynamo and network graph generation, resulting in faster processing times and improved model accuracy
- Evaluated different LLMs' proficiency in generating Verilog for ASIC design using OpenAI 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*

- 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
- Taught weekly sections to students in Python and C++, improving their programming skills and confidence in these languages

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
- Sliced designs for 3D printing using Ultimaker Cura and printed using AnyCubic printer, gaining expertise in 3D design with SolidWorks, which improved prototype development speed
- 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

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.

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.

Social Media Flutterer

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

Egg Incubator

- Programmed an Arduino C++ solution to regulate temperature and humidity in an incubator.
- Integrated sensors to sound an alarm for high temperatures, activate a fan to cool down, and manage humidity by turning on/off a humidifier or evaporating water when necessary.

Certifications

- **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