Vimal Selvarajan

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Education

University of California - Riverside **Riverside, CA**
Bachelor of Science in Computer Science *Expected June 2026*

Technical Skills

Languages: C++, Embedded C/C++, React, JavaScript, HTML, CSS, Python
Developer Tools: Git, GitHub, VS Code, STM32, Altium, SolidWorks, AWS
Technologies/Frameworks: Firmware Design, Linux, Next.js, TailwindCSS, Operating Systems

Experience

Hastest Solutions **Riverside, CA**
Embedded Systems Intern *June 2024 – Present*

- Designed and implemented a comprehensive test automation system to evaluate the long-term performance of a DC amplifier, focusing on its ability to consistently deliver 100mA output under varied voltage conditions.
- Developed Python scripts for controlling and automating DACs, DAQs, and power supplies, notably using Keysight and Texas instruments hardware, enhancing the accuracy and efficiency of data acquisition and device configuration.
- Managed the complete test sequence, including system initialization, parameter adjustments, data collection, and system shutdown, ensuring all components operated within specified parameters across multiple testing phases.
- Instrumental in setting up test procedures for bias voltage adjustments and real-time data logging, providing critical insights into the amplifier's stability and operational integrity.

Highlander Racing FSAE **Riverside, CA**
Firmware Associate Engineer *August 2023 – Present*

- Designed and developed a multi-layer PCB using Altium, reducing error rates by 20% through techniques to display fault notifications from BMS, VCU, vehicle speed, and temperature.
- Implemented thermal management strategies, including the placement of thermal vias and heat sinks, to ensure optimal performance and reliability of the PCB under various operating conditions.
- Created detailed schematic diagrams and optimized multi-layer PCB layouts for the driver dashboard using Altium Designer, ensuring efficient wiring, component placement, and signal integrity.
- Collaborated with firmware and mechanical engineering teams to gather requirements, review designs, and incorporate feedback, ensuring the PCB design met all project specifications.

Projects

Hastest SPI DAC and Power Control
Python, PyFTDI, PyVISA, Virtual Environment, Git

Engineered an automated testing system to evaluate the long-term performance of a DC amplifier, focusing on its ability to maintain a consistent output under varied conditions. Developed Python scripts to automate the control of high-precision measurement and power supply equipment. Executed a comprehensive series of tests including system setup, bias adjustments, and automated data capture. The project significantly improved test efficiency and data accuracy, reducing manual intervention and enhancing reliability.

24E Ergo Dashboard
Altium Designer, CAD, STM32 Cube IDE, Embedded C/C++, GitHub

Engineered the driver dashboard for the '24E vehicle using Altium Designer, integrating the STM32F405 series chip. Included LED matrices and decoders for real-time visual displays, a buck converter for efficient power management, and communication transceivers for seamless data transmission. Enabled the dashboard to display critical fault notifications from the Battery Management System (BMS) and the Vehicle Control Unit (VCU).

Combat Chess
C++, CMake, Valgrind, Google Test, LCOV, GDB

Developed "Combat Chess," a twist on traditional chess with turn-based combat mechanics. Worked in a team using C++, Valgrind, Google Test, and LCOV. Key features include a terminal-based user interface, dynamic chessboard display, and engaging combat scenarios with unique abilities and RNG mechanics. Responsible for coding the general Piece class, Pawn, King, and Rook classes, along with their respective test suites. Established the interface between the UI and Board classes, ensuring adherence to SOLID principles.