Vimal Selvarajan

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Education

University of California - Riverside   **Riverside, CA**
Bachelor of Science in Computer Science with Business Applications   *June 2026*

Technical Skills

Languages: C++, Embedded C/C++, Python, Assembly, React, JavaScript, HTML, CSS
Developer Tools: Git, VS Code, STM32, AWS Cloud9, Altium, SolidWorks
Technologies/Frameworks: Firmware Design, Linux, Next.js, TailwindCSS
Bus/Protocols: I2C, SPI, CAN, RS232, USB, TCP/IP, GPIB

Experience

Hastest Solutions   **Riverside, CA**
Software Engineer Intern   *June 2024 – Present*

- Designed and implemented a comprehensive High Temperature Operating Life (HTOL) test to evaluate the long-term performance of RF Amplifier Modules, consisting of pre-driver, driver, peaking, and carrier amplifiers, by collecting performance data of 48 modules over 1000 hours.
- Collaborated with the customers and hardware design team to define test requirements and develop test fixture DAC and Current Sense PCBAs.
- Managed the complete test solution, including equipment selection, test fixture bring up, test station setup, initialization & power up sequence, amplifier gate voltage control, data collection & monitoring, and power down sequence, ensuring all components operated within specified parameters across multiple testing phases.
- Developed Python scripts for controlling and automating DACs, DAQs, and power supplies, notably using Keysight and Texas Instruments hardware.
- Instrumental in developing algorithms for bias voltage control and real-time data logging, providing critical insights into the module'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.
- Integrated CAN Bus communication to enable real-time data transmission and fault detection within the vehicle control system.
- Utilized STM32CubeIDE and JTAG debugging to develop and troubleshoot firmware for analog-to-digital conversion on the STM32F405RGT microcontroller, enhancing signal accuracy and system reliability.

Projects

Hastest DAC, DAQ, and Power Supply Control Suite
Python, PyFTDI, PyVISA, Virtual Environment, Git

- Designed a scalable object-oriented driver framework for instrument control and application integration.
- Developed a driver module for Texas Instruments AMC7836 DAC/ADC device using PyFtdi and SPI bus.
- Developed driver modules for Keysight power supplies (E36200, E36300, N5700 series) and data acquisition system (DAQ970A) using PyVISA.

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

- Developed "Combat Chess," a twist on traditional chess with turn-based combat mechanics, working in a team using C++, Valgrind, Google Test, and LCOV.
- Implemented key features including a terminal-based user interface, dynamic chessboard display, and engaging combat scenarios with unique abilities and RNG mechanics.
- Developed the general Piece class, as well as the 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.

24E Dashboard Gen one
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, integrated a buck converter for efficient power management, and implemented 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).