

ROHIT SIVAKUMAR

Electrical Engineer | Embedded Hardware | PCB Design | Firmware Bring-Up

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PROFILE

Electrical Engineer with hands-on experience developing embedded electronic products from concept through prototype validation. Skilled in schematic capture, multi-layer PCB layout, embedded firmware, microcontroller programming, PCB assembly/rework, hardware bring-up, mixed-signal debugging, component sourcing, and enclosure design. Strong practical background with BLE devices, battery-powered systems, LED drivers, DAC/H-bridge control, lab instrumentation, and rapid prototyping.

CORE TECHNICAL SKILLS

PCB / Electronics: DipTrace, Fusion 360 Electronics, schematic capture, multi-layer PCB layout, routing, DFM-oriented revisions

Bring-Up / Test: Oscilloscopes, multimeters, programmable power supplies, function generators, soldering irons, hot plates, rework

Mechanical / Prototyping: Fusion 360 CAD, enclosure design, mechanical integration, Bambu Lab FDM, Formlabs SLA resin printing

Embedded / Firmware: Embedded C/C++, microcontroller programming, PIC, Nordic nRF52/nRF52840, SWD/JTAG flashing, hardware control

Manufacturing / Sourcing: JLCPCB PCB/PCBA ordering, DigiKey and Mouser sourcing, BOM support, prototype assembly

Programming / EDA: C/C++, Python, Tcl, Perl, Cadence Genus/Innovus, Synopsys Design Compiler, LTspice

PROFESSIONAL EXPERIENCE

Electrical Engineer | *Alphamicro/Immobileyes* | April 2025 – Present

- Design embedded electronic systems across the full prototype lifecycle, including schematic capture, PCB layout/routing, PCB fabrication, assembly, firmware development, programming, testing, and iterative design improvement.
- Create and revise multi-layer PCB designs for battery-powered products using DipTrace and Fusion 360 Electronics; coordinate PCB/PCBA manufacturing through JLCPCB and source components through DigiKey and Mouser.
- Develop embedded firmware, flash microcontrollers, perform hardware bring-up, and debug firmware/hardware interactions using oscilloscopes, power supplies, function generators, and multimeters.
- Integrate electronics with mechanical enclosures designed in Fusion 360 and support rapid prototyping using Bambu Lab FDM and Formlabs SLA resin 3D printers.

SELECTED PRODUCT DEVELOPMENT PROJECTS

Electronically Adjustable ND Camera Filter

- Led the electrical development of a handheld programmable liquid crystal ND filter controller through three PCB revisions, improving electrical performance, manufacturability, and reliability.
- Designed mixed-signal circuitry integrating a PIC16F15385 MCU, MCP4821 DAC, TPS63070 buck-boost converter, DRV8212 H-bridge, OLED display, battery charging, and battery management.
- Developed embedded firmware implementing programmable AC waveform generation, preset ND levels, manual adjustment, OLED graphics, and battery monitoring.
- Performed prototype assembly, oscilloscope-based validation, firmware debugging, and hardware bring-up while iteratively refining power regulation and output performance.

Bluetooth-Enabled Personal Safety Device

- Designed embedded hardware including schematic capture, PCB layout, USB-C charging, BLE connectivity, LED drivers, haptic feedback, and battery management.
- Developed Zephyr-based firmware on the Nordic nRF52840 for Bluetooth communication, peripheral control, emergency alerts, and system state management.
- Performed PCB assembly, SWD debugging, prototype validation, manufacturing support, and mechanical integration within a compact enclosure.

High-Intensity Diversionary Alert Device

- Designed and optimized a high-output piezoelectric acoustic system using a DRV8662 amplifier and high-power piezo transducer capable of producing approximately 130 dB.
- Iteratively refined the acoustic chamber geometry, evaluated resonance characteristics, synchronized LED signaling with acoustic output, and balanced manufacturability with performance.

Programmable Tactical Lighting System

- Supported the electrical architecture of a battery-powered tactical lighting system integrating high-power white, red, and green LEDs, rechargeable battery systems, USB-C connectivity, and programmable lighting modes.
- Assisted with component selection, PCB design, firmware planning, vendor coordination, thermal evaluation, and prototype validation.

Physical Design Intern | *ProteanTecs, India* | Jul 2021 – Dec 2021

- Supported RTL-to-GDSII physical design flow, including synthesis, floorplanning, place-and-route, timing closure, EM/IR analysis, and signoff using Cadence Genus/Innovus and Synopsys Design Compiler.

Engineering Intern | *Awarpur Cement Works, India* | May 2020 – Aug 2020

- Developed PLC-based automation concepts for wireless communication between stackers and reclaimers and analyzed SCADA/manufacturing data to support process improvement.

EDUCATION

M.S. Electrical and Computer Engineering — University of Washington, Tacoma | Mar 2024 | GPA: 3.8/4.0

B.E. (Hons.) Electrical and Electronics Engineering — BITS Pilani, Hyderabad, India | May 2022

ADDITIONAL ACADEMIC / TECHNICAL PROJECTS

- Model Predictive Control for Active Front-End Rectifier; CMOS Power Amplifier redesign; fuzzy logic load balancing; microgrid energy management algorithm.
- Microcontroller-based Bluetooth writing robot and motion-detection surveillance camera with remote video streaming.