SAIESH SASANE

Embedded Hardware Engineer

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Profiles

saie12

Summary

Embedded Hardware Engineer specializing in high-speed, 6-layer PCB design. Portfolio includes a Gigabit Ethernet interface (STM32F7+DP83867), IoT home automation (ESP32), and low-power GPS trackers (STM32L4). Proficient in KiCad, controlled impedance routing, power integrity, and firmware development.

Education

K.J.College of Engineering & Management Research, Pune **August 2023 - May 2027 (Expected)**
Electronics and Communication Engineering - Advanced Communication Technology B.Eng.
9.1 SGPA

Relevant Coursework: Microcontrollers, Radiation & Microwave Techniques, Digital Communication, Signals & Systems, Control Systems.

Projects

High-Speed Gigabit Ethernet Interface **August 2025 - November 2025**
6-Layer PCB Design for a Gigabit Ethernet Interface (STM32F7 + DP83867)
Website

- Designed a 6-layer, 80x50mm Gigabit Ethernet PCB (STM32F7 + DP83867) with a robust 4-rail power tree (`+3.3V`, `+2.5V`, `+1.8V`, `+1.1V`).
- Managed full layout in KiCad, including 6-layer stackup, power planes, and manual routing of 100Ω differential & 50Ω single-ended traces.
- Successfully passed all ERC (schematic) and DRC (layout) checks and generated final Gerber/drill files for manufacturing.

KiCad, PCB Design, 6-Layer, High-Speed, RGMII, Gigabit Ethernet, STM32F7, Controlled Impedance, Power Integrity, Gerber

ESP32 Dual-Relay Smart Switch **July 2025 - October 2025**
Wi-Fi Connected 2-Layer PCB for Controlling High-Voltage AC Loads
Website

- Designed a cost-effective **2-layer PCB** integrating an **ESP32 module** to wirelessy control dual 110V/230V AC mains appliances via electromechanical relays.
- Engineered a safety-critical layout with **galvanic isolation**, enforcing strict creepage and clearance rules to separate the low-voltage (5V/3.3V) logic from high-voltage AC.
- Implemented transistor-based relay driver circuits and on-board status LEDs for real-time feedback.
- Managed the power distribution network, regulating standard 5V USB input down to a clean 3.3V for stable MCU operation.

ESP32, KiCad, PCB Design, 2-Layer, IoT, Relays, High Voltage, AC/DC Isolation, Safety, Home Automation

STM32 Cellular GPS Asset Tracker **August 2025 - October 2025**
4-Layer Automotive Tracker with STM32, GNSS, and GSM Connectivity
Website

- Designed a robust **4-layer PCB** for real-time asset tracking, integrating an **STM32 microcontroller**, **GPS/GNSS**, and **GSM/GPRS** modules.
- Engineered **50-ohm controlled impedance** transmission lines for GPS and GSM antenna signals to maximize RF performance and minimize loss.
- Implemented a wide-input **12V power management system** with switching regulators, optimized for direct integration into automotive and industrial environments.
- Managed a mixed-signal stackup with a dedicated solid ground plane to isolate sensitive RF components from digital switching noise.

STM32, KiCad, PCB Design, 4-Layer, RF Design, GSM/GPRS, GNSS, 50-ohm Impedance, Automotive Power, UART

Skills

Hardware Design & High-Speed
●●●●○
High-Speed PCB Design (6-Layer), Schematic Capture, Multi-layer PCB Layout, Controlled Impedance Routing, Power Supply Design, Power Integrity, Signal Integrity, Component Selection & Sourcing

Hardware Tools & Software
●●●●○
KiCad, ANSYS (Student), SPICE/ngSpice, Git & GitHub, Soldering (SMD & Through-Hole), Oscilloscope, Logic Analyzer

Programming & Firmware
●●●○○
C, C++, Python, Bare-Metal Firmware Development, ARM Cortex-M, Makefile & GCC Toolchain

Platforms & Microcontrollers
●●●●○
STM32 (F7, L4 Series), ESP32 (Wi-Fi & Bluetooth), GPS Modules (u-blox), LwIP (Lightweight IP Stack), RGMII / RMII Interfaces

Languages
●●●●●
English (Professional), Hindi (Fluent), Marathi (Native)

Certifications

Robotics Controls Engineering Virtual Experience **November 2025**
Johnson & Johnson (via Forage)
View

- **Optimized surgical robotic arm performance** by diagnosing control inefficiencies and implementing Python-based PID algorithms.
- **Validated design modifications** through iterative testing and authored a technical proposal for improved system reliability