

Vinay

Firmware / Embedded Software Engineer
VIT Chennai | B.Tech ECE | GPA: 9.14 / 10 | 2026
VLSI Design Certificate -Maven Silicon

 Vinaysharma17005@gmail.com
 +91-8010471469 | Faridabad, India
 / Vinay-ix |  /Vinay-ix
 / Vinaysh.dev

Summary

Recently graduated ECE student from VIT Chennai (GPA 9.14) with experience in embedded firmware, IoT systems, FPGA design, and real-time communication protocols (UART/SPI/I2C/CAN/MQTT). Skilled in Embedded C/C++, Python, FreeRTOS, and hardware debugging. Seeking Embedded Software, Firmware roles

Skills & Tools

Programming & Scripting: C, C++, Embedded C, Python
Embedded & Real-Time Systems: FreeRTOS, Interrupt Handling, DMA, PWM, ADC/DAC, Sensor Integration
Communication Protocols: UART, SPI, I²C, CAN, MQTT
Embedded Platforms: ESP32, Arduino Uno, Jetson Nano .
Digital Design & Hardware: SystemVerilog, FPGA Design , RTL Design .
Tools & Debugging: Git, Oscilloscope, Logic Analyzer ,ModelSim, Intel Quartus Prime
Soft Skills: Problem Solving , Team Collaboration ,Troubleshooting, Critical Thinking

Internship Experience

Mafkin Robotics Pvt. Ltd. — ECE Intern

Chennai, TN | Oct 2024 – Jan 2025

- Debugged and integrated embedded subsystems (microcontroller firmware, sensors, communication interfaces) for underwater ROV platforms using structured root-cause analysis and oscilloscope / logic-analyzer testing, reducing issue-resolution time by ~25% and integration-test failures by ~20%.
- Collaborated across hardware and software teams to integrate sensor modules and control logic, improving system response time and overall reliability.
- Gained direct exposure to UART/SPI debug workflows and real-world firmware validation in a cross-functional engineering environment.

Projects

AI Power Touch-Free Alert System | ESP32 · Jetson Nano · MQTT · OpenCV · Python

Apr 2026

- Integrated ESP32-based sensor nodes with MQTT communication and OpenCV-based blink detection on Jetson Nano to deliver real-time patient alerts with end-to-end latency under 2 seconds.
- Designed low-latency MQTT pipeline from ESP32 nodes to a centralized dashboard; added Telegram Bot API integration for automated emergency alerts.
- Demonstrated multi-platform embedded + edge-AI integration — MCU firmware, broker-based messaging, and computer-vision inference running concurrently.

Real-Time Avionics Primary Flight Display | C++ · Python · UART · Sensor Data Processing

Sep 2025

- Built a real-time data acquisition and visualization pipeline for sensor-based flight parameters including noise-filtering algorithms to stabilize readings.
- Implemented UART-based serial data transmission between sensor nodes and display; resolved latency and data-consistency issues to optimize end-to-end throughput.
- Outcome: stable, low-jitter display refresh suitable for primary flight instrument simulation.

Real-Time Lossless JPEG-LS Compression on FPGA | SystemVerilog · Intel Quartus Prime · ModelSim

May 2025

- Implemented and validated a high-throughput FPGA image compression pipeline; fixed timing violations and clock-domain-crossing issues to reach stable 103 MHz operation — a 4x throughput gain over initial implementation.
- Verified full correctness via ModelSim simulation and Quartus timing analysis.

ESP32 Health Monitoring System | ESP32 · FreeRTOS · MQTT · JSON · WiFi

Feb 2025

- Designed a multi-sensor health monitoring node integrating MAX30102 (SpO₂/HR), MPU6050 (IMU), DHT22 (temp/humidity), and DS18B20 (body temperature) on a single ESP32.
- Used FreeRTOS tasks and queues to manage concurrent sensor reads, serialized data to JSON, and transmitted over WiFi via MQTT to a cloud dashboard.

Education

Vellore Institute of Technology — *B.Tech – Electronics and Communication Engineering* Chennai, TN | 2022 – 2026
GPA: 9.14 / 10 | Relevant coursework: Embedded Systems, Digital Design, IoT, Signals & Communication

St. Joseph International School — *Higher Secondary (MPC)* Kota, RJ | 2019 – 2020
Percentage : 87/100 %

Modern Arya Public School — *Secondary School (Science)* Faridabad, HR | 2017 – 2018
Percentage : 83.4/100 %

Certifications & Achievements

- Digital Design Training – Maven Silicon — *Verilog, RV32I RISC-V processor fundamentals, UVM verification basics, AHB interface design (Jun–Jul 2024)*
- GATE (ECE) Qualified
- 300+ DSA problems solved on LeetCode
- Coordinated finance awareness session – Dream Merchants Club, VIT Chennai — *event logistics and audience engagement*