

SURAJ KUMAR VERMA

Embedded Systems Engineer | PCB Design | Firmware Development | C/C++
Bangalore, India | +91-8930340287 | surajkverma1107@gmail.com
[linkedin.com/in/surajverma-ece](https://www.linkedin.com/in/surajverma-ece) | github.com/verma-suraj

SUMMARY

First-year Electronics & Communication Engineering student with hands-on experience in end-to-end embedded systems development - from PCB schematic design in KiCad to firmware implementation in C/C++ to IoT cloud deployment. Currently contributing to EV charging and smart energy R&D at Ninety-nine Labs. Recognized with gold and silver medals at state-level science exhibitions.

EXPERIENCE

Research & Product Development Intern

Apr 2026 - till now

Ninety-nine Labs (Antler Group Pvt. Ltd.)

Bangalore, India

- Conducting technical research and analysis on EV charging infrastructure and smart energy system architectures
- Assisting in embedded prototype development, hardware testing, and technical documentation
- Preparing design reports, technical presentations, and engineering specifications for product development
- Collaborating with the founding team on embedded product roadmap and development milestones

PROJECTS

Autonomous Drone for ISRO-URSC 2026

Team Project - In Progress

- Engineering an autonomous UAV for GNSS-denied environments with vision-based object detection and coordinate mapping
- Integrating Jetson Orin Nano Super with Holybro Kakute H743 flight controller via dual SSH MAVLink architecture
- Implementing optical flow and LiDAR-based navigation for GPS-denied hovering and waypoint flight

Tech: Jetson Orin Nano · ArduPilot · MAVLink · Python · Mission Planner · Ubuntu Linux

Custom ESP32 Development Board

Individual - Completed

- Architecting a custom microcontroller PCB from scratch in KiCad with full schematic capture and multi-layer routing
- Performing impedance calculation and EMI analysis; sourcing components via datasheet-driven BOM generation
- Published complete KiCad project files, Gerber outputs, BOM, and 3D renders on GitHub

Tech: KiCad · ESP32-WROOM-32E · PCB Layout · Gerber Generation · Impedance Matching

High-Precision Line Following Robot

Team Project - Completed

- Designed a custom 8-channel TCRT5000 infrared sensor array PCB for high-resolution line detection
- Implemented a finely-tuned PID control algorithm in Embedded C++ for real-time trajectory tracking on ESP32
- Built auto-calibration firmware for adaptive sensor threshold calculation across varying surface conditions

Tech: Embedded C++ · ESP32 · Custom PCB · PID Control · TCRT5000 IR Sensors · TB6612FNG Motor Driver

Kinematic Airplane Simulation System

Individual - Completed

- Developed a real-time feedback interface translating 6-DOF inertial data from an MPU6050 IMU into digital flight mechanics
- Implemented I2C communication protocol for low-latency sensor data acquisition and kinematic processing

Tech: MPU6050 · I2C · C++ · Kinematic Data Processing · Microcontroller Interfacing

Distributed IoT Automation Suite

Individual - Completed (2023)

- Deployed dual connected systems for remote home automation and localized fire detection with real-time mobile alerting
- Integrated sensor payloads with Blynk Cloud and IFTTT to establish low-latency telemetry and notification pipelines

Tech: NodeMCU (ESP8266) · Blynk Cloud · IFTTT · Sensor Integration · Cloud Telemetry

TECHNICAL SKILLS

Languages: C, Embedded C, Bare-metal

Microcontrollers: ESP32, ESP32-S3, STM32, NodeMCU (ESP8266), Arduino

Hardware Design: KiCad (Schematic Capture, PCB Layout, Gerber), Impedance & EMI Analysis, Solidworks

Protocols: I2C, SPI, UART, MAVLink

Platforms & Tools: ArduPilot, Mission Planner, Blynk Cloud, IFTTT, Linux/Ubuntu, Git

Domains: Embedded Systems, Firmware Engineering, PCB Design, IoT, PID Control, Sensor Fusion

EDUCATION

Bachelor of Engineering - Electronics & Communication Engineering

2025 - 2029 (expected)

Sir M Visvesvaraya Institute of Technology (Sir MVIT), Bangalore

VTU Affiliated

HONORS & AWARDS

Gold Medal - State Level Science Exhibition

2022-2023

Pt. Chiranjilal Sharma Govt. College, Karnal

Silver Medal - Inter-District Science Exhibition

2021-2022

Panipat & Karnal Districts

Qualified Preliminary Round as Team Lead - ISRO Robotics Challenge (IRoC-U 2026)

2026

Bangalore, India