Tanuj Rai

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Education

B.Tech in Electrical and Electronics Engineering   *2023 – Present*
Vellore Institute of Technology, Chennai
CGPA: 8.6 / 10

Skills

Core: PCB Design (Multilayer), Thermal Analysis, Power Electronics, BMS, Control Systems
Tools: Fusion 360, KiCad, STM32CubeIDE, MATLAB, Simulink, Ansys Electronics Desktop

Experience

Hardware Consultant – DreamFusion Technologies Pvt Ltd   *Dec 2025*

- Conducted **Thermal Analysis** using Fusion 360 for 3 proprietary PCBs to ensure heat dissipation and reliability.
- Performed **RoHS Compliance Verification** to ensure hardware met international environmental safety standards.

PCB Design Intern – Multi Dimension Technologies, Bangalore   *June 2025 – July 2025*

- Verified and tested a 6S Battery Management System circuit.
- Designed and simulated a power supply PCB for a VESC used in heavy duty drones.

PCB Intern – Prism Studio   *Remote*

- Designed PCBs including a voltage regulator and a smart USB for current and voltage measurement (4-layer).
- Created custom footprints and was awarded **Best Performer Intern**.

Summer Intern – Indian Space Lab   *Remote*

- Gained exposure to geostationary satellites, drone ESCs, and CanSat systems.
- Designed a circular 4-layer CanSat PCB integrating sensors such as DHT22, MQ5, MPU6050, BMP280, and ESP module.

EV Prototyping Intern – NEXEV, VNEST, VIT Chennai   *April 2025 - July 2025*

- Executed component selection and PCB prototyping for an integrated EV charger system.
- Responsible for BMS development and system-level hardware integration testing.

Projects

Automatic Power Factor Correction (APFC)   *Power Electronics, Relay Logic*

- Developed a system to detect low power factor caused by inductive loads and automatically engage a capacitor bank for compensation.
- Gained hands-on experience working with **live AC neutral/phase wiring** to implement real-time switching.

Gesture-Controlled Car and Sign Language Assist Device   *ESP32, OLED, Flex Sensors*

- Engineered a dual-function system using ESP32 for Wi-Fi based gesture control and an OLED-based sign language translator.

PCB Design for Buck Converter   *MATLAB, KiCad*

- Designed and fabricated a compact single-layer 24V to 12V buck converter based on MATLAB simulations.

Positions of Responsibility

General Secretary – HAVOLTZ Club (EEE Dept.)   *2025 – Present*

- Designed and Manufactured PCB for a Line Follower Robot in the shape of chassis.
- Managing technical events and workshops, including PCB design sessions during techfests like IIT Bombay's Meshmerize.

Electrical Team Member – Technocrats Robotics   *2024 – Present*

- Developed the central control board for an **Autonomous Rover** using **STM32** and **KiCad**.
- Manufactured and debugged the full control stack, utilizing **STM32Cube** for firmware and hardware integration.

Certifications

- PCB Designing – Pantech ProED Pvt. Ltd.
- IoT and Embedded Systems – University of California (Coursera)
- PLC Training Program – VIT Chennai