VED RAUNDAL

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EDUCATION

Year	Degree/Exam	Institute	CGPA/Marks
2026	B.Tech in Electronics and Communication Engineering	MIT World Peace University, Pune	8.81/10.0

WORK EXPERIENCE

Hardware & Embedded engineer at Quoppo **Dec '25 - Present**
Hardware Design Team *Pune, India*

- Independently owned **end-to-end hardware development** (schematic, component selection, PCB layout, testing, deployment) for **8** production-grade systems across drone, robotics, industrial, and medical domains in **under 7 months**.
- Delivered high-density multilayer PCB designs (up to **6 layers**) spanning motor control, RF communication, CAN-based robotics networks, power electronics, and a safety-critical medical device.

Hardware Embedded Intern at DLOGIXS USA **Jan '25 - Dec '25**
Hardware Design Team *Hybrid*

- Designed and developed industrial embedded hardware modules including power regulation, signal conditioning, and MCU-based control.
- Delivered **5 R&D prototypes (4-layer PCBs)** using custom libraries and embedded source code.

Workshop Organizer & Instructor
MIT World Peace University *Pune, India*

- Conducted **STM32** microcontroller workshops for **150+** students across **3** sessions.

PROJECTS

All 8 projects below independently delivered end-to-end (schematic → component selection → PCB design → testing → debugging) at Quoppo, Dec '25 – Present, in under 7 months.

1. 6-Layer All-in-One Flight Controller for Drones

- Designed the complete schematic and a **6-layer**, high-density PCB stack-up for an all-in-one flight controller for a **4-motor** drone platform, integrating the DRV motor-control stage, RF/telemetry communication, and power management on a single board.
- Performed component selection and power-stage design sized for continuous currents up to **30A** per motor channel, with dedicated power/ground plane splits to isolate digital, RF, and high-current sections from noise coupling.
- Carried out full bring-up, functional validation, and flight-readiness testing before deployment.

2. 2.4 GHz RF Communication Module

- Designed a high-sensitivity **2.4 GHz** RF PCB (nRF24-class front end) applying careful RF layout practices – controlled-impedance traces, ground stitching, and antenna matching – to minimize signal loss.
- Achieved receiver sensitivity down to **-104 dBm** at low data rates and link range up to **1 km** line-of-sight with a PA/LNA stage, enabling reliable long-range wireless links.
- Built as a general-purpose communication board usable across multiple platforms beyond drones, taken end-to-end from schematic to validated hardware.

3. Indigenous Drone Remote Controller

- Developed **India's first** indigenously designed drone remote controller, engineering the complete peripheral set – dual joysticks, mode switches, telemetry display, and RF communication link – integrating **10+** discrete peripherals onto a single board.
- Selected components balancing battery life, ergonomics, and RF range for a handheld transmitter unit.
- Delivered the project fully end-to-end: schematic design, PCB layout, hardware bring-up, and field testing with the paired drone platform.

4. FOC Controller Board for BLDC Robotic Actuators

- Designed a **Field-Oriented Control (FOC)** board for BLDC motors driving robotic actuators, rated for continuous phase currents up to **20A** at **24-48V** supply.
- Implemented **CAN bus** communication (up to **1 Mbps**) to support multi-node robot networks, enabling coordinated control across multiple actuators from a central controller.
- Verified current sensing, commutation accuracy, and thermal performance across load conditions during bring-up.

5. Multi-Purpose Robot Controller Board

- Designed a plug-and-play controller board supporting **3** interchangeable compute modules – Jetson, Raspberry Pi, and ESP32 – via a common connector and interface standard.
- Enabled a single board design to serve multiple robot platforms and use cases without hardware redesign, cutting development time for new robot variants.
- Delivered schematic, layout, and functional validation across all three compute-module configurations.

6. Hall-Effect Encoder Boards

- Designed multiple contactless magnetic (**Hall-effect**) encoder board variants delivering **12-bit** (**4096** counts/revolution) absolute position feedback for motor and actuator control.
- Explored additional sensing technologies beyond Hall-effect to trade off cost and precision across different actuator use cases.
- Validated angular accuracy and noise performance across board revisions.

7. Industrial PLC-Replacement Controller Board

- Designed a high-power controller board to replace industrial PLCs, engineered to directly drive high-current industrial actuators and contactors.
- Implemented **Ethernet** communication (**10/100 Mbps**) for high-speed integration with industrial networks, and **optocoupler**-isolated I/O (**2.5 kV+** isolation) to safely control high-voltage, high-power stages.
- Designed the power-electronics sections – drivers, isolation, and protection circuitry – to meet industrial reliability requirements.

8. Class-C Medical Device for Drug Delivery

- Designed a high-precision drug-delivery device classified **IEC 62304 Class C** – the highest software safety class, where a failure could cause serious injury or death.
- Engineered the hardware to meet the rigorous verification, documentation, and risk-control requirements associated with Class C classification.
- Owned schematic design, component selection, and PCB design end-to-end, adhering to relevant medical safety standards.

SKILLS AND EXPERTISE

- **PCB & Circuit Design -** Altium Designer, Proteus, schematic capture, high-density multilayer routing (up to **6 layers**), RF PCB design, power electronics PCB design
- **Communication Protocols -** CAN (5 Mbps), I2C, UART, Ethernet (10/100 Mbps), 2.4 GHz RF
- **IDEs & Tools -** LTspice, MATLAB, Simulink, Multisim, Vivado, Cadence, Termux
- **Languages -** Verilog, RTL, Embedded C, C++, Python 3, Assembly, MATLAB
- **Domain -** Drone systems, robotics actuation (FOC/BLDC, encoders), industrial power electronics (PLC replacement), IEC 62304 Class C medical devices