Gaurav Bhole

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Education

BTech, Electronics and Communication Engineering **07/2022 – 07/2026**
Vellore Institute of Technology

Work Experience

Intern at Armament Research and Development Establishment, DRDO **05/2025 – 07/2025**

- Performed hardware validation and designed the embedded system architecture for a real-time Fire Control System (FCS) for anti-aircraft applications.
- Wrote drivers for custom made peripherals such as joysticks, encoders, camera, target tracking unit, pan-tilt mechanisms, braking mechanisms etc.
- Developed CMSIS-RTOS v1 firmware with efficient scheduling and safe inter-task communication.
- Implemented safety mechanisms to ensure deterministic system response.
- Made hardware aware design choices for enhanced fault detection, tolerance and rectification.
- Optimised control of high-power devices such as solenoids and brakes with PWM based control algorithm to reduce power consumption and heat dissipation.
- Implemented PID control for autonomous operation of Pan-Tilt-Firing mechanism.
- Tech used: UART, RS422, RS232, RS485, PWM, PID, FreeRTOS, CMSIS-RTOS v1, STM32, STMcubeIDE.

Drone Development Intern at InsideFPV **04/2023 – 05/2023**

- Designed and built the company's drone products, integrating hardware and software for optimal flight performance.
- Worked on hardware integration, debugging and drone configuration through programming with tools like Betaflight, INAV, and Mission Planner.

Project Experience

Model Compression Using TensorFlow. **04/2025 – 05/2025**

- Implemented Quantization to achieve 75 Percent reduction in model size and 8 times increase in speed, exploring SIMD to achieve even greater results.
- .This can be used to deploy models in resource constrained devices like embedded systems

Minidrone Line Follower **08/2024 – 08/2024**

- simulated a line following drone using MATLAB and Simulink.
- Designed a control system model, incorporating image processing to detect and follow a line using a vision sensor.

Flight Controller for Drone **05/2020 – 08/2020**

- Designed a STM32 based flight controller.
- Assembled and programmed an autonomous drone using various flight controllers.
- Experimented with various firmware including Betaflight, INAV and Mission Planner.

Bone Conduction Hearing aid **05/2018 – 06/2018**

- Modified a Bluetooth speaker using a DC motor as a transducer to leverage bone conduction
- Developed a significantly cost-effective prototype, presented at GGSF College.

Skills

Programming Languages: MATLAB, Java, Python, C, C++, Embedded C, 8051 Assembly, Verilog
Tools and Platforms: Arduino, ESP32, STM32, Raspberry Pi, Linux, Simulink, Cadence
Hardware: Motor drivers , sensors, debugging, Oscilloscope, Function generators.
Other Skills: soldering, presentation, researching, datasheet reading, circuit design, tinkering.