# Shubham Dattatray Asole

asoleshubham01@gmail.com (+91) 8767239628 Shubham Asole asoleshubham0125 Portfolio

Embedded Systems Engineer experienced in microcontrollers, Linux development, communication interfaces, and system debugging, focused on building reliable real-time embedded solutions.

## Skills

**Programming:** Embedded C, C++, Python, ARM Assembly, Java
**Embedded Platforms:** ESP32, PIC Microcontrollers, ARM Cortex-M, Raspberry Pi
**OS & Kernel:** Linux, POSIX APIs, multithreading, real-time systems
**Protocols:** UART, SPI, $I^2C$, RS-232, RS-422, TCP/IP, UDP, Ethernet
**Hardware Knowledge:** Timers, GPIO, DMA, ADC, H-Bridge motor control
**Tools:** GDB, Logic Analyzer, MPLAB X, MATLAB/Simulink, Vivado, LabVIEW, LTspice
**Domains:** Robotics, IoT Systems, Sensor Integration, Control Systems

## Education

**B.Tech in Electronics and Communication Engineering**
IIITDM Kancheepuram *2022 – Present*

## Internship Experience

**Embedded Systems Intern** *Startrit Infratech Pvt Ltd — May 2025 – Aug 2025*

- Developed an embedded mobility system for automating barrier operations, incorporating obstacle sensing, motor control, and remote command functionality.
- Implemented real-time safety logic using timer-driven distance measurement to prevent collisions during system operation.
- Designed firmware for bidirectional motion control using digital I/O drivers, integrated safety timeouts, and movement-status indicators.
- Created a lightweight command interface enabling serial-based control and system diagnostics.
- Conducted hardware–software validation through iterative testing, debugging, and instrumentation using embedded development tools.
- *(Details generalized to respect NDA constraints.)*

**Ultrasonic NDT Simulation for Structural Inspection** *(MATLAB + System Design)*

- Built simulation models to study ultrasonic wave interactions with structural materials for defect detection and signal interpretation.
- Analyzed multiple defect scenarios using A-scan and B-scan visualizations to derive generalized crack-identification patterns.
- Designed high-level system architecture involving scanning mechanisms, ultrasonic sensing modules, and signal-processing workflow.
- Developed scripts for wave propagation visualization, echo analysis, and defect signature extraction.
- Authored documentation outlining simulation methodology and generalized system architecture for future prototyping stages.
- *(Details generalized to respect NDA constraints.)*

## Academic Projects

**Optical Wearable Probe for Neonatal Jaundice Monitoring**

- Designed microcontroller-based optical measurement system using LEDs and photodiodes for non-invasive bilirubin estimation.
- Implemented real-time filtering and calibrated signal acquisition with interruption-driven sampling routines.

**Railway Sleeper Block Dimension Validation System**

- Developed an ESP32-based inspection system using integrated sensors and camera modules.
- Implemented UART/I2C interfaces and validation logic achieving ±10 mm measurement accuracy.

**Smart LPG Monitoring System**

- Built an IoT-based gas detection system with threshold-based sensing and alert mechanisms.

**Satellite Data Prediction and Visualization**

- Implemented Python scripts for orbital prediction and produced 3D visualization plots for trajectory analysis.

## Position of Responsibility

**Hostel Affairs Coordinator** *IIITDM Kancheepuram — 2023 – 2024*

- Managed operations for 1000+ residents; coordinated logistics, maintenance workflows, and student issue resolution.
- Led a student team for campus-wide event execution and administrative coordination.