ABHISHEK PUJARI

Embedded Software Engineer — Firmware Engineer

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Professional Summary

Embedded Software Engineer with hands-on experience in firmware development using **C, C++, and Embedded C**. Skilled in **ARM Cortex-M (STM32)** microcontrollers, **bare-metal programming**, **real-time embedded systems**, and **RTOS concepts**. Experienced in **CAN protocol**, UART, SPI, I2C, sensor interfacing, IoT systems using ESP8266 and MQTT, and low-level debugging using oscilloscopes, logic analyzers, and GDB. Seeking entry-level embedded firmware or automotive software roles.

Core Technical Skills

Programming Languages: C, C++, Embedded C, Python
Microcontrollers: ARM Cortex-M, STM32F4, ESP32, Arduino
RTOS: FreeRTOS
Communication Protocols: CAN, UART, SPI, I2C, MQTT
Peripherals: ADC, Timers, PWM, GPIO
Debugging Tools: GDB, Oscilloscope, Logic Analyzer
Development Tools: STM32CubeIDE, Keil, GCC, CMake, Git
IoT / ML: ESP8266, ThingsBoard, OpenCV, TensorFlow, Keras
Operating Systems: Embedded Linux, Linux

Work History

Embedded Software Engineer — PG-DESD Major Project
Vehicle Safety using CAN and IoT — Aug 2025 – Feb 2026

- Developed embedded firmware in **Embedded C and C++** for **STM32F407 (ARM Cortex-M4)** microcontrollers.
- Implemented **CAN communication** using MCP2551 transceivers with zero message loss during functional testing.
- Integrated ultrasonic, temperature, and gas sensors using ADC, GPIO, and timers.
- Implemented **UART-based GPS (M8N) data parsing** and IoT data upload using **ESP8266 and MQTT**.
- Debugged real-time firmware using **GDB, logic analyzer, oscilloscope**, and serial logs.

Machine Learning Engineer — B.Tech Major Project
Augmented Road Safety: Real-Time Drowsiness Detection — Aug 2024– July 2025

- Developed a non-intrusive, webcam-based driver drowsiness detection system using **computer vision and deep learning**.
- Implemented face and eye detection using **Haar cascades** and eye-state classification using **InceptionV3 (transfer learning)**.
- Trained on **84,898 eye images (37 subjects)**, achieving **93.98% accuracy**, **F1-score 0.939**, and **ROC-AUC 0.944**.
- Built a **Streamlit-based UI** with live feed, drowsiness score visualization, and real-time alarm using Pygame.

Embedded Systems Developer — Academic Project
Anti-Sleep Alarm for Drivers Jan 2024 – June 2024

- Designed and implemented an **Arduino Nano–based** driver drowsiness detection system using an **IR eye-blink sensor**.
- Implemented real-time alert logic triggering audible warnings within **200 ms** of prolonged eye closure.
- Simulated vehicle speed reduction using relay-controlled BO motor for safety response demonstration.
- Achieved automatic ON/OFF behavior based on real-time eye-blink status.

Education

PG Diploma in Embedded Systems and Design (PG-DESD)
CDAC Sunbeam, Pune, India 2025 – 2026

Bachelor of Technology in Electronics and Telecommunication Engineering
Jorhat Institute of Science and Technology, Assam, India 2021 – 2025

Achievements

- Chief Minister of Assam — **Special Merit Scholarship** for academic excellence.
- **Anundoram Borooah Award** for excellence in HSLC examination.

Leadership & Initiatives

- President, Electronics Hobby Club (JIST): Led 30+ member technical community; organized embedded systems and robotics workshops.
- Department Representative, ETC (JIST): Coordinated academic, cultural, and technical events.
- Volunteer: Participated in blood donation drives, clothing donation camps, and educational outreach initiatives.