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## BHARATH KUMAR MURUGAN



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### Professional Summary

**Embedded Engineer with 8 months of hands-on experience** in developing, testing, and deploying real-time embedded firmware for robotics and automation systems. Proficient in microcontroller programming, sensor integration, motor control, and basic debugging. Contributed to multiple client facing projects—primarily in defence and industrial automation—focused on autonomous robotic applications. Comfortable interacting with clients to understand technical needs, demonstrate system functionality, and assist in implementing requested features.

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### Professional Experience

#### **Embedded Engineer Gridbots Technologies, Ahmedabad — Sep 2024 – Present**

- Designed and developed embedded firmware in C for robotic systems including autonomous industrial robots and defence prototypes.
  - Integrated peripherals and sensors using protocols such as **SPI, I2C, CAN**, and **UART** on **ARM7 (LPC2129)** microcontrollers.
  - Conducted real-time hardware debugging and functional testing to ensure stable system performance.
  - Actively involved in **client-facing discussions**—explained robotic functionality, gathered client feedback, and incorporated feature requests into firmware.
  - Collaborated with cross-functional teams to ensure project success from prototype to deployment.
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### Key Projects

#### **Gun Barrel Cleaning Robot**

- Developed firmware to control linear and rotary actuators and monitor sensor feedback for cleaning operations inside a gun barrel.
- Ensured reliable execution in constrained and sensitive environments through safety-focused logic and structured coding.

### Autonomous Pick and Place Robot (Industrial Handling Robot)

- Engineered firmware for an autonomous robot that detects, picks, and places industrial components.
- Used motor encoders, distance sensors, and finite state machines for precise task execution.
- Deployed and tested for **Volvo India**, ensuring reliability and compliance with industry standards.

### Body Control Module – Automotive Prototype

- Created **CAN-based** firmware for controlling automobile body functions like lighting and locking.
- Built scalable and modular control logic suitable for various prototype platforms.

### PWM Signal Generator

- Utilized internal PWM module of **LPC2129** to control DC motor speed dynamically.
- Designed a test interface for calibrating pulse parameters based on motor response.

### Real-Time Temperature Monitoring System

- Interfaced **LM35** sensor with LPC2129 via **SPI** for continuous temperature sensing.
- Triggered alerts and displayed live data using interrupts and an LCD interface.

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## Education

### B.E. – Electrical and Electronics Engineering

St. Joseph's College of Engineering, Chennai — *Graduated 2023*

- **CGPA:** 8.38

### Higher Secondary Education (XII), 2019

St. Paul's Matriculation Higher Secondary School, Neyveli

- **Percentage:** 67%

### Secondary Education (X), 2017

St. Paul's Matriculation Higher Secondary School, Neyveli

- **Percentage:** 86%

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## Courses & Certifications

### Advanced Embedded Systems Development

Vector India — *Completed (Valid until May 2024)*

- Mastered Embedded C and C++ programming for microcontroller-based applications

- Gained experience with Linux: command-line tools, process handling, IPC, and basic driver development
- Completed real-time projects including:
  - Body Control Module using CAN communication
  - PWM Motor Speed Control
  - Sensor-based system interfacing

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### **Core Competencies**

- Embedded C Programming & Debugging
  - ARM-based Microcontroller Development (LPC2129)
  - Sensor & Peripheral Integration
  - Real-Time Motor Control & PWM Techniques
  - Communication Protocols: SPI, I2C, UART, CAN
  - Analog & Digital Circuit Design
  - Linux-based Development Environments
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