

SOHINI DUTTA

Embedded System | AI & ML | Communication Protocols

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PROFILE

Engineer with expertise in Embedded C/C++, STM microcontrollers, motor control, CAN protocol, and sensor integration, complemented by hands-on experience in computer vision, YOLO model training, and OpenCV-based deployment on NVIDIA Jetson. Focused on developing intelligent, real-time edge AI systems for automation and scalable engineering solutions.

WORK EXPERIENCE

CNH Industrial ITC, Graduate Trainee

04/2025 – Present

- Developed embedded control systems using STM32 microcontrollers for motor and actuator operations
- Implemented CAN communication protocol for real-time data exchange between system component
- Integrated sensors and actuators for automation and control system
- Worked on system-level integration using NVIDIA Jetson
- Debugged hardware and firmware issues, improving system performance and reliability
- Developed AI models including data annotation and model training etc.

Capgemini, IT Support Engineer

09/2024 – 02/2025

- Delivered comprehensive system administration and technical support, troubleshooting user issues and ensuring high system availability, performance, and reliability.

IEEE Computer Society of India Kolkata Chapter,

2023

Training in Web Development using php

Novel School of Cyber Technology & Computer Academy, Training in Python

2022

EDUCATION

B.Tech in Electronics & Communication Engineering, MCKV Institute of Engineering

2024

GPA: 85%

Diploma in Electronics & Telecommunication Engineering,

2021

Jnan Chandra Ghosh Polytechnic

GPA: 82%

SKILLS

Embedded & Hardware:: STM32, Arduino | CAN, I2C, SPI, UART | DC/BLDC/Servo/Stepper Control | Sensors, Actuators, Relays | NVIDIA Jetson

Software & AI/ML:: C, Python, Linux, Git | YOLO, OpenCV | Model Training, Evaluation, Data Annotation

Tools & Systems: MATLAB, STM32CubeMX, Arduino IDE | Hardware Debugging, System Testing, Performance Optimization | Control Logic, System Integration of motor

PROJECTS

Robotic Fruit Picker(Robotic arm), Autonomous Fruit Harvesting Robot with Integrated Actuation and Sensing

- Developed CAN communication system for efficient inter-device data exchange and built a dashboard with integrated database for real-time monitoring and analysis.
- Built a CAN bus data logging system using Arduino, enabling reliable data capture, storage, and post-analysis for performance monitoring and debugging.
- Designed and programmed STM32-based embedded systems in C to efficiently control actuators and integrated hardware components.
- Deployed NVIDIA Jetson for vision-based data processing and system control, optimizing it for headless operation and remote accessibility.
- Implemented pressure sensor-based feedback to control actuator-driven suction and release mechanisms.
- Assisted in test data acquisition and analysis, and contributed to the redesign and optimization of wiring harnesses and cable routing for enhanced performance and maintainability.

Baler telematics system, A system to provide real-time, remote monitoring of agricultural balers, tracking key metrics like bale weight, moisture content, GPS location, and machine health, often transmitting data to cloud-based portals.

- Integrated and tested a moisture sensor system to measure moisture percentage in a baler, ensuring reliable data for process control.
- Designed a CAN communication system to transfer real-time data from devices to a dashboard for monitoring and analysis.

ProductLineVision, AI based system for detecting defects, missing parts for manufacturing goods.

- Worked with data preprocessing tasks including sorting, annotation, and structuring of datasets to enable efficient analysis and model readiness.
- Implemented and trained multiple computer vision models using YOLO and OpenCV, focusing on object detection, Segmentation and performance optimization.

Earthquake Detector Alarm using Accelerometer

- Built a Earthquake detection Alarm system with the help of Accelerometer, Arduino and Motion sensor and alert mechanism based on threshold values.

Design of A Saloon Management System

- Designed a Website for a saloon to manage its Customers, Bookings, payments etc.

Home Automation Using Arduino Uno

- Developed automation system using Arduino and relay modules, controlled appliances using sensor-based logic and UART communication.

Temperature & Humidity Detection Using Arduino

- Designed system using Temperature & Humidity sensors for real-time environmental monitoring and accurate data processing with help of Arduino.