Sri Harsha Andukuri

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Summary

As a student of Electronics and Communication Engineering, I am deeply passionate about the integration of hardware and software systems. My journey began with hands-on projects using Arduino and C programming, which sparked my strong interest in embedded systems. Over time, I have gained substantial experience not only in embedded development but also in the domains of Machine Learning and Deep Learning. Currently, I am diving deeper into real-time systems, working extensively with RTOS to build efficient, time-critical embedded applications.

Education

RGUKT — *Nuzvid*
B.Tech in Electronics and Communication Engineering — *2022 – 2026*
CGPA: 8.57

RGUKT — *Nuzvid*
Machine Learning Minor Degree — *2024 – 2026*

RGUKT — *Nuzvid*
Pre University Course — *2020 – 2022*
CGPA: 9.83

Sri Chaitanya — *Visakhapatnam*
SSC — *2019 – 2020*
CGPA: 10

Skills

- **Programming Languages:** C, Python
- **Hardware Platforms:** Arduino, Raspberry Pi, STM32CubeIDE
- **Software Tools:** Xilinx Tools, MATLAB, LTSPICE, KiCAD, RTOS

Experience

Research Intern – NIT Warangal
May 2025 – July 2025

- Working on a deep learning-based project titled **"Crop Recommendation System Using Deep Learning"**, under the guidance of Dr. Vasundhara, NIT Warangal.
- Designed a multi-model pipeline for predicting weather, crop yield, and Minimum Support Price (MSP) using TCN, BiGRU, N-BEATS, and BiLSTM models.
- Proposed a revenue-based crop recommendation strategy that achieved over 96% accuracy for top crop prediction across districts.
- Used over 30 years of historical data and applied feature engineering, time-series preparation, and hybrid neural architectures.

Intern – Tunichal Automations Pvt. Ltd.

Dec 2024 – Jan 2025

- Completed a 2-month internship focusing on fundamentals of Circuit and PCB Design.
- Gained experience in designing basic circuit layouts and translating them into PCB schematics.

Projects

Design, Development, and Testing of a Real-Time Intelligent Traffic Control System using FreeRTOS

STM32F446RE, IR Sensors, FreeRTOS, UART Logging

- Designed and implemented intelligent traffic controller on STM32F446RE with a FreeRTOS-based architecture .
- Built sensor–based density classification per lane and a dynamic priority scheme that ensures fairness
- Implemented LED-based signalling logic (RED = stop, BLUE = wait, GREEN = go) to emulate realistic intersection behavior.
- Verified deterministic decision loop and scheduling behavior through structured UART logs of lane densities, selected priorities, and phase durations.

Project Repository

Automated Plant Watering System Using ML

NodeMCU, Python for analysis and model training

- Created a real-time machine learning algorithm for processing data with weather forecasts and soil moisture levels to optimize plantation irrigation strategy.
- Integrated soil moisture sensors and weather data to predict watering needs.
- Applied ML algorithms with both historical and current data to adjust watering schedules.
- Implemented automated watering via a pump controlled by a microcontroller.

github.com/Harshaamn/AUTOMATED-PLANT-WATERING-SYSTEM-USING-ML

Coal Mine Safety Monitoring System with realtime website

ESP8266, Firebase, Netlify

- Developed a NodeMCU-based coal mine safety monitoring system for workers.
- Created an automated alert system monitoring temperature, humidity, and gas levels via Firebase; now used by over 4 team members, enhancing operational efficiency.
- Displayed real-time data on a web interface for monitoring.
- Implemented an alarm system to alert unsafe conditions via a buzzer.

github.com/Harshaamn/COAL-MINE-SAFETY-MONITORING-SYSTEM

Speed Control of DC Motor Using Fuzzy Logic

NodeMCU, Firebase, Optical Encoder, Arduino IDE

- Designed and implemented a fuzzy logic controller (FLC) on ESP8266 NodeMCU for adaptive DC motor speed control.
- Collected user inputs via a Firebase-connected web interface for target distance and time; computed speed requirements accordingly.
- Used triangular membership functions and a rule base for PWM output control.
- Integrated a rotary encoder for real-time feedback to fine-tune system accuracy.
- Logged pulse count, speed, and motor response on Firebase for remote monitoring and analysis.

github.com/Harshaamn/SPEED-CONTROL-OF-DC-MOTOR-USING-FUZZY-LOGIC

Crop Recommendation System Using Deep Learning

Python, Keras, TensorFlow, Time-Series Forecasting

- Developed an integrated deep learning framework during a 9-week internship at NIT Warangal to recommend the most profitable crop for a district and year.
- Built weather forecasting models (TCN + BiGRU) with RMSE as low as 0.0571 and used them to feed downstream tasks.
- Predicted crop yield using N-BEATS (MAE = 879.32 kg/ha) and MSP using BiLSTM/N-BEATS with MAPE as low as 0.45%.
- Designed a recommendation pipeline using revenue estimation from predicted yield and MSP, achieving 96.14% accuracy.

github.com/Harshaamn/CROP-RECOMMENDATION-SYSTEM-USING-DEEP-LEARNING

Certificates

Machine Learning

- **Essential Mathematics for Machine Learning** NPTEL
  A course offered by Indian Institute of Technology Roorkee.
- **Machine Learning for Engineering and Science Applications** NPTEL
  A course offered by Indian Institute of Technology Madras.
- **Applied Linear Algebra for Signal Processing, Data Analytics and Machine Learning** NPTEL
  Completed 12-week course with a consolidated score of 98%. A course offered by Indian Institute of Technology Kanpur.

Embedded Systems

- **KiCAD PCB Design for Embedded Systems & Electronics Projects** UDEMY
  A course offered by DeepBlueMbedded Academy.
- **Electronic Systems Design: Hands-on Circuits and PCB Design with CAD Software** NPTEL
  A course offered by Indian Institute of Technology Madras.
- **Embedded for Beginners** NIELIT CALICUT
  A course offered by NIELIT Calicut.
- **Mastering RTOS: Hands-on FreeRTOS and STM32Fx with Debugging** UDEMY
  A course offered by FastBit Embedded Brain Academy.