

SHYAMCHARAN K

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EDUCATION

National Institute of Technology, Tiruchirappalli

November 2022 – Present

B.Tech in Instrumentation and Control Engineering

Relevant Coursework: Control Systems | Signals and Systems | Digital Electronics | Sensors and Transducers

Microprocessors and Microcontrollers | Analog Signal Processing | Data Structures and Algorithms

AREAS OF INTEREST

- Multi-Robot Systems
- Computer Vision
- Controls
- Embedded Electronics

TECHNICAL SKILLS

Languages & Frameworks: Python | Embedded C | C/C++ | ROS | ESP-IDF

Libraries: OpenCV | PyTorch | Numpy | Matplotlib

Development Tools: Linux | Arduino | Raspberry Pi | NVIDIA Jetson

INTERNSHIPS

Embedded Systems Intern

June 2024 – July 2024

Thryv Mobility, IIT Madras

- Designed and fabricated PCBs for digital and analog circuits including buck converters and power management systems.
- Implemented I2C and SPI drivers for LIS3DH accelerometers with fall and tap detection capabilities.
- Developed embedded systems using ESP-IDF framework and BLE protocols for next-generation mobility applications.

Winter Research Intern

December 2023 – January 2024

ICE Department, NIT Trichy

- Developed a Lower Limb Rehabilitation Device integrating NEMA 23 geared BLDC motors and IMU sensors.
- Implemented open-loop control using motor hall sensors for precise motion tracking.
- Designed digital closed-loop control system leveraging IMU feedback for enhanced functionality.

PROJETCS

FashionMNIST Classifier

December 2024

- Developed and evaluated various models for FashionMNIST, including linear classifiers, ReLU-based networks, and advanced CNN architectures (LeNet-5, VGG-16, ResNet-18).
- Fine-tuned hyperparameters to enhance model performance and efficiency.
- Applied data preprocessing techniques to improve training outcomes and model generalization.

EdVisor

September 2024 – Present

Assistive Reading and Learning Device

- Built an assistive device using Raspberry Pi Zero and NVIDIA Jetson Nano running local LLM and TTS models.
- Implemented hand gesture-based ROI extraction for text selection and processing.
- Working on fine-tuning Language Models to process textbook information.

MedVisor

January 2024 - April 2024

AR Glass for Surgeons and Medical Students

- Developed a prototype AR glasses using Raspberry Pi Zero to project real-time visual data into the user's field of view.
- Integrated Porcupine wakeword detection and a speech-to-text (STT) model for hands-free operation.
- Created a system to display AI-generated responses, powered by Gemini, in AR to assist in medical decision-making.

Luminosity Drone

August 2023 – November 2023

e-Yantra Robotics Competition 2023

- Developed OpenCV algorithms for real-time organism detection, using drone camera feed to identify and track targets.
- Implemented and optimized a PID controller for precise drone navigation, ensuring stability during flight.
- Simulated drone behavior in Gazebo using ROS 1, testing flight dynamics and refining performance.

POSITIONS OF RESPONSIBILITY

Robotics and Machine Intelligence

August 2023 – Present

- Robotics and Machine Intelligence (RMI) is the official robotics and technical research society of NIT Trichy that carries out projects ranging from assistive technology to mobile robots to humanoids.
- As an active member and researcher, worked on multiple robotics projects and competed in various competitions.