Ayush Acharya

2nd year undergraduate

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EDUCATION

Bachelors of Technology in Computer Science Engineering with Specialization in Cyber Physical Systems

Vellore Institute of Technology, Chennai **(CGPA: 9.1/10)**   *Aug' 23 - Jul' 27*

SKILLS

Languages and Frameworks: C++, Embedded C, Python, Java, Verilog, ROS1, Flask.

Software and Libraries: Arm, Keil, Git, Docker, TensorFlow, Computer Vision, serial.

Embedded Systems: Arduino, ESP's (32 and NodeMcU), RasberryPi Pico, RasberryPi, Xavier

EXPERIENCE AND POSITIONS

Dreadnought Robotics, Chennai, India [Instagram] | *Technical Member*   *Apr' 24 – Present*
  ➢ Worked on the AUV, contributing for adding a new hull, Separating **ESCs** from the main hull to reducing the *Electro Magnetic interference* between ESC's and *Pixhawk* as well as other sensors by more than 30%.

SEDS Antariksh, Chennai, India [LinkedIn] | *Electrical and Electronics Lead*   *Oct' 24 - Present*
  ➢ Led 10 membered team in various embedded projects involving CanSat, Telescope and Rover.
  ➢ Actively Working on CanSat Project, handling real-time communication between the ground-station and the satellite using **Xbee** Modules.

PROJECTS

Autonomous Underwater Vehicle (AUV) [Github]

  ➢ Developed an *Autonomous Underwater Vehicle* (**Project MIRA**) incorporating **Intel's NUC** and **Nvidia's Jetson Xavier** for executing the perception (**Autonomous Mode**) and control stack (**PID**). The system primarily employs **MobileNet** and **ResNet** architectural models for advanced object detection and navigation.

  ➢ Primarily focused on the *embedded systems* aspect of the vehicle, including electrical design and sensor interfacing as key contributions.

ROS based Garbage Collecting Bot (RAGeD) [Github]

  ➢ Developed an ROS-based self-navigating robot equipped with a **MobileNetV2 SSD** architecture for garbage detection, with **ROS** serving as the primary framework for system integration and functionality.
  ➢ Implemented both manual and **autonomous** modes, enhancing system robustness by enabling fault diagnosis and debugging through manual operation.
  ➢ Also Developed a website that receives real-time data from the bot, including descriptions and locations of collected garbage, featuring a user-friendly interface for efficient monitoring and interaction.

Remotely Controlled IOT bot [Website]:

  ➢ Developed a **remotely controlled IoT-based robot** enabling global operation, with a website that receives real-time images and sensor data from the bot for monitoring and analysis.
  ➢ Utilized Flask and **Flask-SocketIO** as the core frameworks, integrating OpenCV for image processing and real-time data handling.

Mars Rover Replica [Github]:

  ➢ Designing a Perseverance Mars Rover replica with enhanced functionalities, incorporating 3D CAD modeling, embedded systems, ROS, and machine learning algorithms.
  ➢ Implemented **visual odometry** using **Optical Flow** and **ORB** algorithms to estimate the robot's trajectory. The extracted motion data was plotted to analyze movement patterns, facilitating future integration with SLAM applications.

ACHIEVEMENTS

  • **Winner, CyberSpectrum 3.0** *[Nov '24]:* Demonstrated a Remotely Controlled Bot, using a Self-made Sever, Flask and Socket IO with its Own Custom Website.

  • **2nd Runner Up**, **Nexathon'25** *[Feb '25]: Demonstrated an autonomous rag-picking robot using a custom-trained MobileNetV2 SSD for object detection, with ROS for communication and an ESP32 for control.*

  • **Top 15, Intel Gen-AI Hackathon** *[Sep 24]:* Demonstrated an Autonomous Rag Picking Bot, using ROS and OpenCV algorithms.