

Education

Indian Institute Of Technology Dharwad

Dec. 2022 - 2026

BS in Interdisciplinary Sciences, Major Chemistry

Minor in Computer Science and Engineering

Work Experience

R&D Intern | Indrones Solutions Private Limited

May 2025 - July 2025

- Developed Antenna tracker using FC and **Ardupilot**, used GPS data of vehicle for tracking by moving the yaw and pitch servos, improved range by 50%.
- Setuped and worked on Ardupilot ROS2(Humble) **Simulation** for testing and developing **LUA scripts** and drone object avoidance system using Lidars for detecting obstacles, created Gazebo worlds for better testing environment.
- Created a Iris drone with lidar and a 3DOF gimbal camera for ardupilot ROS2 simulation, integrate gimbal control using **MAVLink** plugin, controable using GCS like QGC, integrated 1D, 2D, 3D lidars in base frame of drone.
- Streamed real-time ROS 2 image data over **RTSP** using a custom GStreamer pipeline with appsrc, x264enc, and GstRtspServer

Projects

AMR using SLAM



- Implemented **SLAM** for differential drive mobile robot autonomy using **ROS2** Humble and RViz, Simulated in Gazebo
- Implemented **NAV2** stack with **DWA** local planner for real time dynamic obstacle avoidance, Optimized **AMCL** particle filter parameters for constrained environments.
- Developed automated **docking** mechanism utilizing ultrasonic sensor array with differential distance analysis for alignment

RL based Multi Robot Navigation



- Implemented a **MAPPO** framework with multi head self attention encoder for cooperative multi robot navigation under **CTDE** paradigm, achieving collision avoidance across 5 agents in a 20×20 m environment.
- Built a three stage curriculum learning pipeline in MATLAB from scratch using only Deep Learning Toolbox, training over 2000 episodes with **GAE**, PPO clipping, entropy annealing, and KL early stopping.

4Dof Robotic Arm



- Built a 4DOF robotic arm from scratch, ROS2 Humble, Gazebo simulation pipeline with ROS2 Control for hardware integration, **Moveit** for IK solving and Arduino Uno R4 for low evel servo control.
- Developed a **stereo depth camera** using ESP32 cam, YOLOv8 for real time object detection, estimating 3D coordinates of objects.

Technical Skills

Languages: C/C++, python, Javascript, Bash Script

Frameworks And Tools: ROS2, PX4, Ardupilot, ReactJS, Tailwind CSS, Bootstrap, Linux, GitHub

Soft Skills: Communication, Leadership, Managing resources, Teamwork

Relevant Coursework

Mechatronics and Robotics, Data Structures and Algorithms, System Software Lab, Introduction to Probability Theory, Linear Algebra, Computer Architecture and Lab, Discrete Structures

Achievements

- Member of the Coding Club at IIT Dharwad, with a 1000+ rating on Codeforces and a 1500+ rating on Leetcode, reflecting strong problem-solving abilities. [Codeforces](#), [Leetcode](#)
- Selected for the qualification round of **IRoC-U 2025** (hosted by ISRO) after clearing the preliminary round. The challenge involves building a drone under 2kg that can autonomously navigate to safe spots **without GNSS**.
- Participated in **e-Yantra** Robotics Competition hosted by IIT Bombay, focusing on "Logistic-co." Developed code for robot and UR5 arm using ROS2 humble to simulate in gazebo and Rviz and physically execute box pickup and drop. Successfully completed Task 4 out of 6 in the competition.
- Achieved **4th** place in the Low-Prep Inter-IIT Tech Meet 2024 with **RigBetel Labs**, working on multi-TurtleBot mapping and real-world localization; also participated in the High-Prep Inter-IIT challenge with **ideaForge** to develop a drone capable of safe landing under motor failure in both simulation and real-world tests.
- Achieved first place in SOI 24, where I developed a fully functional, responsive library management system featuring separate user and admin dashboards.