

Ankit Talele

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EDUCATION:

Worcester Polytechnic Institute

M.Sc. Robotics, CGPA: 3.77/4.0

Aug 2022 - May 2024

University Of Mumbai, VESIT

B.Tech, Electronics Engineering, CGPA: 8.68/10 | Roles: Team Lead DrishTI (Texas Instruments)

July 2017 - Jun 2021

EXPERIENCE:

Robotics Software Engineer | Void Robotics | Marathon, Florida (Remote)

Aug 2024 – Present

Improving a Custom Rover for Delivery Tasks.

- Implemented GPS Waypoint tracking on a custom rover for Delivery Tasks.
- Ported a NAV2 service which wasn't implemented on ROS2 Humble for our task.
- Achieved 92% accuracy in reaching the goal using GPS Waypoints.

Tools Used – C++, Python, ROS2, Gazebo, Git, Docker

Deep Learning Research Student | Medical FUSION Lab, WPI | Advisor: Dr. Haichong Zhang [Poster](#)

Jan 2024 – May 2024

Designing a custom 3D CNN model for Gesture Recognition using Ultrasound Imaging

[Selected for presentation at the **IEEE International Ultrasonics Symposium (IUS) 2024 Conference**]

- Developed a 3D CNN model from scratch to work both in spatial and temporal frames to compare information processed through video frames in the training data instead of image snippets.
- Achieved 98% accuracy on an 11 Class classification model with our self-created data set.
- Currently tackling the issue of identifying finger force estimation

Tools Used – Pytorch, Tensorflow, Docker, Ultrasound Probe, 3D printed jig with vicon markers and sensors, Git

Sep 2019 - Feb 2020

System Controls Automation Intern | Electronic Control System | Nagpur, India

- **Designed and implemented SCADA systems** for a milling factory to optimize and monitor operations effectively.
- **Developed and fine-tuned PID controllers** for milling robots, ensuring precise and stable control of the robotic milling processes.
- **Programmed PLC ladder logic** on Philips PLCs tailored to meet the specific needs of individual clients, enhancing operational efficiency and customization.
- **Configured and programmed DC servo motors** using PLCs for a garment factory, improving automation and control in the production process.

RELEVANT PROJECTS:

Navigating the Unknown- Optical flow based structure-less gap detection for drone flight [GitHub](#)

Oct 2023-Dec 2023

- Developed an autonomous navigation system for the **DJI Tello EDU drone** to traverse irregular-shaped windows.
- Implemented optical flow detection to identify and maneuver through the largest available gaps in obstacles.
- Enhanced quadcopter guidance with visual servoing, aligning the drone's image center with gap centers for precise navigation.
- Applied post-processing techniques to optical flow data for accurate contour mapping of navigational paths.

Tools Used: PyTorch, Tello EDU, NVIDIA Orin Nano, Blender, Python

The Perception Saga- Sim2Real Quadcopter Perception Stack [Video](#) [GitHub](#)

Oct 2023-Dec 2023

- Engineered a perception stack for the **DJI Tello EDU**, enhancing drone navigation precision using **sim2real** techniques and **YOLOv8** for window detection.
- Conducted camera calibration to determine camera intrinsics for the **Perspective-n-Point (PnP) algorithm**.
- Implemented the **Perspective-n-Point (PnP) algorithm** for real-time pose estimation, ensuring safe flight through multiple windows.

Tools Used: PyTorch, Tello EDU, NVIDIA Orin Nano, Blender, Python

Autonomous Navigation and Control of DJI Tello Quadcopter using RRT and PID Control [GitHub](#) [Video](#)

Oct 2023-Nov 2023

- Implemented **RRT* algorithm** for path planning and minimum snap trajectory generation for DJI quadcopter.
- Developed Map Reader class in Blender for safe 3D environment navigation and obstacle margin creation.
- Designed and tuned a cascaded PID controller for precise trajectory following in position and velocity control loops.
- Conducted sim-to-real transfer with NVIDIA Jetson Orin Nano, executing trajectories on a real quadcopter.

Robust Trajectory Tracking for Quadrotor UAVs using Sliding Mode Control [GitHub](#) [Video](#)

Nov 2022-Dec 2022

- Generated Quintic Trajectories: Created MATLAB scripts for smooth polynomial path planning.
- Implemented Sliding Mode Control: Designed robust control laws for altitude and attitude stabilization.
- ROS and Gazebo Integration: Developed and tested control algorithms in a simulated environment

Tools Used: MATLAB, Python, ROS Noetic, Gazebo, Crazyflie 2.0, PyTorch, Blender

Unscented Kalman And Madgwick Filter for Sensor Fusion [GitHub](#)

Aug 2023-Sep 2023

- Implemented the Unscented Kalman Filter (UKF) and Madgwick filter to estimate the attitude of a quadrotor using IMU raw data.
- Tuned parameters to ensure the filter output closely follows the ground truth estimation.

Multi Robot Motion Planning for warehouse management using WHCA* [GitHub](#)

Feb 2023- May 2022

- Built a 2D simulation environment of a warehouse.

- Implemented global and local planners using WHCA* for robots loading and unloading items.

Tools Used: Python, Matplotlib