

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

July 2017 - Jun 2021

EXPERIENCE:

Deep Learning Engineer | Find Me LLC

Dec 2024 - Present

- Deployed object detection and pattern detection models to identify specific items in supermarkets.
- Deployed face recognition on profile maker website to expand network easily.
- Created an object detection model with 80% accuracy with video frames to detect an object from a video/image frame.

Tools Used – Pytorch, Opencv, Python, 3D Modelling, Git, Docker

Robotics Software Engineer | Void Robotics

Aug 2024 – Dec 2024

Creating a GPS Navigator for a Custom Rover using ROS 2

[Developed for simulated environments]

- Developed a GPS-based navigation system enabling accurate localization and path planning in ROS 2.
- Built a simulation environment in Gazebo to test and validate navigation algorithms.
- Optimized URDF files to address odometry drift issues, improving localization accuracy.
- Implemented autonomous navigation using Nav2 goals with real-time feedback.

Tools Used – ROS 2, Gazebo, Python, C++, Git, Docker

Deep Learning Research Student | Medical FUSION Lab, WPI | Advisor: Dr. Haichong Zhang

Jan 2024 – May 2024

- Designed a multi-modal 3D CNN for ultrasound-based gesture classification, fusing spatial (frame-wise) and temporal (video sequence) data streams.
- Achieved 98% accuracy on an 11-class classification model, showcasing its potential for medical device integration, such as gesture-based control for assistive and robotic prosthetics.
- Utilized Vicon motion capture markers to accurately measure finger angles, enabling precise mapping of ultrasound signals to hand gestures for medical use cases.

Tools Used – PyTorch, TensorFlow, Docker, Ultrasound Probe, 3D-printed medical jigs with Vicon markers and sensors, Git.

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

Sep 2019 – Feb 2020

- **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.

PUBLICATIONS:

Hand Gesture Classification Based on Forearm Ultrasound Video Snippets Using 3D Convolutional Neural Networks

[Paper Link](#)

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

[Poster](#)

- Presented a novel 3D CNN-based framework designed for accurate hand gesture recognition using forearm ultrasound videos. This system demonstrates potential for integration into medical devices, such as robotic prosthetics, enabling intuitive and precise control.
- Achieved significant improvements in classification accuracy over state-of-the-art alternatives, underscoring its relevance for medical imaging and assistive robotics applications.

ACHIEVEMENTS:

Presented my first-author publication at the **IEEE International Ultrasonics Symposium 2024 (Virtual Presentation)**, showcasing innovative research on gesture recognition using ultrasound imaging for medical robotics.

[Video](#)

RELEVANT PROJECTS:

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

- **Built a 2D simulation environment** of a warehouse.
- **Implemented global and local planners using WHCA*** for robots loading and unloading items.
- **Used a block-like grid for navigation**, assuming robots on rails.

Tools Used: Python, Matplotlib

Firefighting Using Robot Swarms [GitHub](#)

- Simulated forest fires and compared swarm behavior by creating a simulation environment.
- Tackled forest fires using robot swarms with A* path planning and dynamic obstacle avoidance.

Tools Used: Python, Pygame

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

- **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.
- **Deployed Perspective-n-Point** to calculate center depth and distance using camera intrinsics.

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- **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

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

- **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.

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

- **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**.
- **Generated custom synthetic training data** for neural networks to identify and segment windows in complex environments.
- **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

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

Generated quintic polynomial trajectory using set waypoints and traced a track in Gazebo.

Tools Used: Gazebo, Python, ROS, Crazyflie 2.0 platform, MATLAB

ACTIVITIES:

Texas Instruments Organized DrishTI Innovation Challenge – Secured **3rd place** in the DrishTI Innovation challenge as a **team-lead** on team “UAV” with the topic of painting high rise buildings using UAV’s.

Embedded C using ESP32 and Internet of Things – Participated in **IOT** and **Embedded C** workshop in college organized by Tech-Tinkerers Lab
