Ankit Talele

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Interests: Perception, Robot Path planning, Robot Controls

EDUCATION

Worcester Polytechnic Institute *Aug 2022 - May 2024*
M.Sc. Robotics, **CGPA: 3.83/4.0**
Courses: Aerial Robotics, Motion Planning, Robot Controls, Swarm Intelligence

University Of Mumbai, VESIT *Jul 2017 - Jun 2021*
B.Tech, Electronics Engineering, ***CGPA:*** **8.68/10** | *Roles: Team Lead DrishTI*
Courses: IOT, VHDL, Embedded Systems, Linear Integrated Circuits, Digital Circuit Design

SKILLS

Programming Languages : Python, C++, MATLAB, Buzz
Software and Environments : ROS, Git, Gazebo, ARGoS, Blender

WORK EXPERIENCE

Electronic Control System | Automation Intern *Dec 2019 - Jan 2020*
Profiling and Instrumentation
- Developed and installed **SCADA systems** for factory client's automation.
- **PLC ladder programming** to control DC servo motors according to client needs.

RELEVANT PROJECTS

Planning and control pipeline for the DJI Tello EDU drone Link *Jan 2023-Feb 2023*
- Advanced RRT* algorithm for 3D path planning in DJI Tello Edu drone, with obstacle navigation and Blender visualization of waypoints and tree expansion.
- Drone trajectory optimization using cubic spline for dynamic feasibility, integrated with PX4 stack cascaded controller and fine-tuned PID control.
- Comprehensive Blender simulations for obstacle navigation testing, with successful real-world deployment on DJI Tello EDU in various scenarios.
- Tools Used – Python, Tello EDU, NVIDIA Orin Nano, Blender

Unscented Kalman And Madgwick Filter for Sensor Fusion Link *Aug 2023-Sep 2023*
- Implemented UKF and Madgwick filter to estimate attitude of a quadrotor using IMU rawdata.
- Tuned parameters so that filter output will follow the ground truth estimation.

Robust Trajectory Tracking for Quadrotor UAVs using Sliding Mode Control Link *Nov 2022-Dec 2022*
- Generated **quintic polynomial trajectory** using set waypoints and traced a track in gazebo.
- Tools Used: Gazebo, python, ROS, crazyflie 2.0 platform, MATLAB

Multi Robot Motion Planning for warehouse management using WHCA Link *Feb 2023- May 2022*

Built 2D simulation environment of a warehouse.
- Implemented **Global and Local planner using WHCA*** for robots loading and unloading items.
- Block like grid was used for navigation assuming robots on rails.
- Tools Used – Python, Matplotlib

Firefighting Using Robot Swarms Link *Mar 2023- Apr 2023*

Simulated forest fires and compared swarm behavior by creating a simulation environment.
- Tackled forest fires using robot swarms using A* path planning and dynamic obstacle avoidance.
- Tools Used – Python, Pygame

Wildfire *Feb 2023-Mar 2023*

Designed 3D path planning for trailer-truck
- Used **combinatorial A* algorithm** and **sampling based PRM algorithm** to tackle forest fires.
- Enforced non-holonomic constraints to the vehicle and used **Ackermann steering** for the firetruck.
- Tools Used – Python

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