Prakrit Tyagi

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EDUCATION

Carnegie Mellon University — Pittsburgh, USA
Master of Science in Mechanical Engineering - Research — May 2024
- GPA: 4.00/4.0
- Relevant Coursework SLAM, Optimal Control, Machine learning, Planning, CV, Robot Dynamics

Delhi Technological University — Delhi, India
Bachelor of Technology in Mechanical Engineering — May 2021
- GPA: 8.75/10.0

SKILLS

Programming Languages: Python, C++, Julia
Software/Frameworks: MATLAB, SOLIDWORKS, ROS2, Rviz, Latex, Git, Numpy, CasADi
Simulation Tools: Gazebo (Harmonic), Webots

EXPERIENCE

REx Lab, Carnegie Mellon University — Pittsburgh, USA
Graduate Research Assistant | Advisor Zachary Manchester — January 2023 - Present
- Developed a state dependent LQR thrust controller for a off the shelf quadrotor with PX4 and raspberry pi.

Moon Lab, IISER Bhopal — Bhopal, India
Research Assistant | P. B Sujit — August 2021 - June 2022
- Developed a MPC based control formulation for a fixed wing UAV to track a ground vehicle, using CasADI and Ipopt solver
- Researched the feasibility of online optimal control for fixed wing UAV with high tracking capabilities

ACADEMIC PROJECTS

- *Facial Expression Recognition and Classification*
  - Built a shallow neural network architecture using convolutions to classify human emotions from pictures with 70% accuracy. Collaborated with a team of 3.
- *Optimal control for race car minimum time lap*
  - Developing a pipeline to generate optimal race lines for a race car using collocation methods and track them using optimal control to drive around a track in minimum time.
- *Super VLOAM*
  - Collaborated with a team of 3 for integrating Super-Point and Super-Glue deep learning models for feature extraction in VLOAM.
- *Life long Multi-agent planning*
  - Collaborated with a team of 3 to devise a high level planner based on conflict based search algorithm for multiple agents in a warehouse environment.

PUBLICATIONS

- P. Tyagi, Y. Kumar and P. B. Sujit, "NMPC-based UAV 3D Target Tracking In The Presence Of Obstacles and Visibility Constraints," 2021 International Conference on Unmanned Aircraft Systems (ICUAS), Athens, Greece, 2021, pp. 858-867, doi: 10.1109/ICUAS51884.2021.9476710.
- D. Soni, A. Manoharan, P. Tyagi and P. B. Sujit, "Learning-based NMPC Framework for Car Racing Cinematography Using Fixed-Wing UAV," 2022 International Conference on Unmanned Aircraft Systems (ICUAS), Dubrovnik, Croatia, 2022, pp. 1397-1403, doi: 10.1109/ICUAS54217.2022.9836154.
- P. Tyagi, C. Liu and P. B. Sujit, "Energy optimal 3D target tracking using fixed-wing UAV," 2022 International Conference on Unmanned Aircraft Systems (ICUAS), Dubrovnik, Croatia, 2022, pp. 1404-1410, doi: 10.1109/ICUAS54217.2022.9836170.