Aditya Deole

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About Me

I am a PhD candidate working in Control Theory under Prof. Mesbahi at the Dept. of Aeronautics & Astronautics, UW. I am seeking employment opportunities with research in robotics and controls, with a focus on navigation and estimation. My past research focused on controller synthesis methods and estimation-aware trajectory optimization for vision-guided navigation. I have investigated methods in control theory that can safely interact with ML-driven estimation algorithms. I am also deeply invested in solving scientific problems with control theory. Currently, I am working on a challenging problem of system identification and manipulation solutions for Neuronal dynamics.

My main motivation for control theory comes from my background in hardware applications. I have been working on autonomous navigation for ground and aerial robots and have supervised robotics projects at the RAIN Lab.

Education

University of Washington — September 2020 – Present
PhD in Control Theory, Dept of Aeronautics and Astronautics — *Seattle, WA, US*

University of Washington — September 2017 – June 2020
MS Mechanical Engineering — *Seattle, WA, US*

Swati Jain College — August 2016 – July 2017
PGDCA Copmputer Applications — *Indore, MP, India*

Visvesvaraya National Institute of Technology — August 2012 – May 2016
B.Tech Mechanical Engineering — *Nagpur, MH, India*

Research Experience

Research Assistant Rain Lab — September, 2020 – Present
University of Washington — *Seattle, WA*

- Current Research: System Modeling and Controller design for High-Dimensional Neuronal Dynamics in Mice.
- Past Research: Robust Controller and Trajectory Synthesis for ML-based Vision-guided navigation in Satellite Rendezvous Applications.
- Hardware Educational Testbed Supervisor for in-house aerial and ground robots at RAIN Lab.

Research Assistant Rain Lab — September, 2018 – May, 2020
University of Washington — *Seattle, WA*

- Development of quadrotor for autonomous navigation
- Masters Thesis:

Internship at BattGenie Inc — Summer-Fall, 2019
Seattle, WA

- Design of State Estimation algorithms(MHE,EKF,PF) for High-order Battery Dynamics
- Mechanical Design and Prototyping of PCB housing for Battery Management System

Publications

A. Deole, M Mesbahi. "*Estimation-Aware Trajectory Optimization with Set-Valued Measurement Uncertainties.*" arXiv preprint arXiv:2501.09192 (2025) (under Review at JGCD).

A. Deole, et.al. "*Multi-Agent Passivity-based Control for Perception-based Guidance*," AIAA 2023-2156. AIAA SCITECH 2023 Forum. January 2023.

J. Becktor,**A. Deole** et. al., "*Robust Vision-based Multi-spacecraft Guidance Navigation and Control using CNN-based Pose Estimation*," 2022 IEEE Aerospace Conference (AERO), Big Sky, MT, USA, 2022

N Rahimi,**A. Deole**, et. al. "*Robust Controller Synthesis for Vision-based Spacecraft Guidance and Control*," AIAA 2022-2213. AIAA SCITECH 2022 Forum. January 2022

A. Deole, et. al. "*MPC-based Estimation-Aware Trajectory Generation for Uncontrolled Satellite Pose Tracking*," AIAA 2024-0947. AIAA SCITECH 2024 Forum. January 2024.

Bandyopadhyay,**A Deole**, et.al. "*Vision-based Distributed Pose Estimation using a Spacecraft Constellation*," AIAA 2023-2506. AIAA SCITECH 2023 Forum. January 2023.

Awards & Honors

S. Rao and Usha Varanasi Endowed Fellowship in Aeronautics and Astronautics Fall 2020
University of Washington

Specialized Skills

Programming Languages: Python, MATLAB, C++
Software Packages: Unreal Engine 4/5, ROS2
Embedded Systems: Arduino, PX4 Autopilot, NIDaq

Teaching Experience

Pre-Doctoral Instructor- AA101 Fall, 2022
University of Washington *Seattle, WA*

- Lecturer for AA101: Introduction to air and space vehicles. Designed and delivered course content and assigned Lab and quiz hours. Organized a graduate seminar series for interaction with grad students at AA department.

Instructor-Fundamentals in Robotics Summer, 2018
UW Continuum college *Seattle, WA*

- Lecturer for Introduction to Robotics Design and AI for international students from Xiangfei Education group. Course included topics on path planning, Manipulator kinematics and AI.
- Organized Coursework and Educational Robotics Lab visits

Instructor-SAT prep and Data Analysis Fall-Winter, 2018
UW Continuum college *Seattle, WA*

- Instructor for SAT preparatory course in Physics for international students from KAUST group.

Instructor-Fundamentals in Robotics Summer, 2018
UW STEMSub *Seattle, WA*

- Instructor for Robotics Design course in where we developed a introductory robotics course covering basics in physics, math and programming integrated with practical applications of mobile robots.