

AMAN TIWARY

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in [Aman Tiwary](#)

🔗 [GIT](#)

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SUMMARY

I specialize in motion planning and controls for robotic platforms, with experience in C++ and Python. I am eager to contribute to innovative projects and solve complex real-world challenges in autonomous UAVs.

EDUCATION

MS in Mechanical Engineering | University of Washington

Sep. 2021 - Aug 2024

Coursework: Convex Optimization, Reinforcement Learning, Computer Vision, Controls

GPA: 3.80/4.0

Specializing in **Motion Planning and Controls**, advised by Dr. Behçet Açıkmeşe

BE in Mechanical Engineering | Birla Institute of Technology

Aug 2013 - May 2017

Coursework: Vehicle Dynamics, Finite Element Method, Data Structures & Algorithms

GPA: 7.91/10.0

Graduated with distinction

EXPERIENCE

Graduate Student Researcher | Autonomous Controls Lab | UW Seattle

Mar 2022 - Sep 2024

- Perception aware trajectory planning for 3D scene reconstruction: Developed **6DOF quad-rotor trajectory planning package**(C++, Python), integrating **active vision** techniques with **convex optimization-based guidance methods**
- Built a guidance framework to generate feasible trajectories for continuous acquisition of high-resolution images of the target object in complex environments resulting in high-quality **point cloud reconstruction**
- Designed and implemented an object reconstruction system, solving the minimum viewpoint problem using **Mixed Integer Optimization** (C++, Python, PCL)
- Maintaining **Trajectory Optimization** software library for live flight demonstrations with quad-rotor(C++)that directly contributed to successful execution of **20+** live flight demonstrations involving complex aerial maneuvers with quad-rotors

Controls Engineering Intern | MONARCH TRACTOR | California, US

Jun 2022 - Sep 2022

- Conducted **system identification** and designed a **feedforward controller** for an Electro-Hydraulic Steering Actuator, reducing steering response time by **100 ms**

Cost Engineering | TATA Motors Ltd | Maharashtra, IND

Jul 2018 - Jul 2021

- Led **cost-reduction** projects on **Gearbox** and **Engine Cooling System** for Euro 6 vehicles, identifying **\$2 million** in potential savings

PROJECTS

Reinforcement Learning for Flying Insect Robots 📄 | UW

Sep 2022 - Dec 2022

- Implemented the **Proximal Policy optimization** method in **AirSim** (Microsoft Simulator) to train a quad-rotor equipped with cameras to autonomously navigate the corridor without colliding

Gaussian Process Regression for Li-Ion battery modeling 📄 | UW

Apr 2022 - Jun 2022

- Implemented **Gaussian Process Regression** (GPR) to model the behavior of Lithium-ion (Li-ion) batteries, predicting key parameters like resistance and capacitance

Manipulating Images Using Autoencoders 📄 | UW

Jan 2022 - Mar 2022

- Developed and trained a **Convolutional Autoencoder** to denoise an image for classification(MNIST Dataset) using Pytorch achieving a minimum classification accuracy of **76.5%** at a noise factor of **0.9**(Gaussian noise)

MPC for Autonomous Car 📄 | UW Formula Motorsports-Driverless

Jan 2022 - May 2022

- Implemented **MPC-based** nonlinear **vehicle-bicycle-model** in Python to find an optimal set of control inputs to go around the track

Design Optimisation of a Car Underbody Diffuser | Undergraduate Thesis

Aug. 2016 - May. 2017

- Conceptualized and simulated the undertray design with the car in optimum lap, demonstrating an improvement of **2.5%** in a lap time of the car without undertray

TECHNICAL SKILLS

Programming	C/C++, Python, Matlab, Simulink
Tools	Linux, ROS2, L ^A T _E X, GitHub, Jira, Confluence
Libraries	Eigen, PCL, Open3D, CVXPY, OpenCV
Simulation/Design	AirSim, Rerun, Solidworks, AutoCAD, ANSYS