PRITHVI PODDAR

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EDUCATION

University at Buffalo — Buffalo, USA
Ph.D. in Mechanical and Aerospace Engineering — August 2023 – Present
Cumulative GPA: 4.0/4.0

Indian Institute of Science Education and Research (IISER) Bhopal — Bhopal, India
BS-MS in Electrical Engineering and Computer Science — August 2017 – June2022
Cumulative GPA: 8.54/10.0

RESEARCH INTERESTS

Reinforcement learning, graph learning, multi-robot systems, optimization (Research Profile: Google Scholar)

SKILLS

Programming languages	Python, MATLAB, C, C++, Mathematica, R
Softwares and Simulators	ROS, Gazebo, Rviz, AirSim, Webots, CARLA, MavROS, Ardupilot, PX4
Platforms	Arduino, Raspberry Pi, Nvidia Jetson, PixHawk
Robots	TurtleBot, Crazy Flies, Blue ROV, UAVs, UGVs
Libraries	PyTorch, OpenAI Gym, PyBullet, MuJoCo, NVIDIA Issac Gym

EXPERIENCES

Research Assistant — January 2024 – Present
University at Buffalo
Advisor: Dr. Souma Chowdhury

- Working on reinforcement learning for multi-agent systems, optimization problems, topological data analysis, and imitation learning.
- Applications of my research are in power-grid management, multi-agent systems, Urban Air Mobility, etc.
- Working on Office of Naval Research (ONR) funded project- GRAPPLE, where we develop multi feasible solutions for multi-agent multi-task problems

Teaching Assistant: Applied Mathematics (MAE 376) — August 2023 – December 2023
University at Buffalo

Project Associate: Generalizing Robot Perception for Indoor and Outdoor Scenarios — October 2022 – June 2023
Indian Institute of Technology Jodhpur
Guide: Dr. Mayank Vatsa / Dr. Sujit P.B

Project Associate: Development of Ai Based Perception and Control System Software — June 2022 – September 2022
IISER Bhopal
Guide: Dr. Sujit P.B.

- Project funded by the Defense Research and Development Organization (DRDO) for developing a deep learning model for controlling an autonomous rover using visual inputs from stereo cameras and lidar.

Leader: Systems Integration (Team Luna) — March 2022 – August 2022
MBZIRC Maritime Grand Challenge 2023

- Leader of the systems integration team under Tema Luna from IISER Bhopal, for the Mohamed Bin Zayed International Robotics Challenge (MBZIRC) Maritime Grand Challenge.
- Responsibilities include the integration of the logic, communication, tracking, navigation and manipulator sub-systems into the simulated robots and physical robots.

Teaching Assistant: Deep Learning (DSE316/616) January 2022 – May 2022
IISER Bhopal
Course Instructor: Dr. Mayank Vatsa / Dr. Sujit P.B.

Undergraduate Researcher August 2020 – June 2022
Multi-robot Autonomy (MOON) Lab @ IISER Bhopal
Guide: Dr. Sujit P.B.

- Started working on robotics and reinforcement learning while gaining experience with robotic hardware.
- Research focused on application of reinforcement learning with multi-agent systems and unmanned aerial vehicles.
- Involved in developing autonomous on-road rover.

MS Thesis August 2021 – May 2022
Multi-robot Autonomy (MOON) Lab @ IISER Bhopal
Guide: Dr. Sujit P.B.

- Successfully defended my MS thesis on “Deep Reinforcement Learning Based Fault Tolerant Controller For Quad Rotors Suffering From Single Rotor Failure”.
- Developed a Soft Actor-Critic based controller to maneuver quad rotors after they have suffered from a single rotor failure.

Summer Intern May 2019 – August 2019
Robert Bosch Centre for Cyber Physical Systems @ Indian Institute of Science
Guide: Dr. Raghu Krishnapuram

- Worked on estimation of depth maps form monocular images, to be used for autonomous driving. Used deep convolutional networks and KITTI data to train a generative model for estimating depth maps form monocular images.

AWARDS AND FELLOWSHIPS

INSPIRE (Innovation in Science Pursuit for Inspired Research) Scholarship - 2017
Awarded by the Department of Science and Technology (DST), Govt. of India for excellence in Grade XII

PUBLICATIONS

- **Prithvi Poddar**, Steve Paul and Souma Chowdhury. "A Graph-Based Adversarial Imitation Learning Framework for Reliable & Realtime Fleet Scheduling in Urban Air Mobility," AIAA 2024-4006. *AIAA AVIATION FORUM AND ASCEND 2024* . July 2024.
- M. Mishra, **P. Poddar**, R. Agrawal, J. Chen, P. Tokekar and P. B. Sujit, "Multi-Agent Deep Reinforcement Learning for Persistent Monitoring With Sensing, Communication, and Localization Constraints," in *IEEE Transactions on Automation Science and Engineering*, doi: 10.1109/TASE.2024.3385412
- Souradip Chakraborty, Amrit Singh Bedi, Kasun Weerakoon, **Prithvi Poddar**, Alec Koppel, Pratap Tokekar, Dinesh Manocha (2022). “Dealing with Sparse Rewards in Continuous Control Robotics via Heavy-Tailed Policy Optimization.” *2023 IEEE International Conference on Robotics and Automation (ICRA)*, London, United Kingdom, 2023, pp. 989-995, doi: 10.1109/ICRA48891.2023.10161186

COURSES

Probability, Optimization, Non-Linear Control Systems, Uncertainty Quantification, Optimal Control, Multi-Agent Systems, Discrete Mathematics, Multivariate Calculus, Data Structures and Algorithms, Theory of Computation, Software Modelling and Verification, Principles of Communications, Analog and Digital Circuits, Computer Organization, Deep Learning, Electronic Devices, Intelligent Robotics, Internet of Things.