

SRIYASH PODDAR

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RESEARCH INTERESTS

Human Robot Interaction: Reinforcement Learning, Social Navigation, Multi-Robot Systems, Lifelong Learning

EDUCATION

Indian Institute of Technology Kharagpur

M.Tech and B.Tech in Computer Science and Engineering

Advisor: [Prof. Partha P. Chakrabarti](#)

2018 – 2023

GPA: 9.40/10.0

PUBLICATIONS

[1] **Does Human Motion Prediction Quality Always Transfer to Robot Performance in Crowd Navigation?**

S. Poddar, C. Mavrogiannis, S. S. Srinivasa

Preprint November 2022.

[2] **Winding Through: Crowd Navigation via Topological Invariance**

C. Mavrogiannis, K. Balasubramanian, S. Poddar, A. Gandra, S. S. Srinivasa

In the IEEE Robotics and Automation Letters (RA-L) November 2022.

[\[PDF\]](#)

[3] **TRACE: Topologically Constrained Reward Aware Action Embeddings for Life-Long Learning**

S. Poddar, T. Anand, P. Badjatiya, J. Subramanian, G. Theocharous, K. Balaji

Under review at NeurIPS Workshop on Human in the Loop Learning 2022. US Patent accepted.

[\[PDF\]](#)

[4] **Understanding the Role of Affect Dimensions in Detecting Emotions from Tweets: Multi-task Approach**

R. Mukherjee, S. Poddar*, A. Naik*, S. Dasgupta, N. Ganguly

In International ACM SIGIR Conference on Research and Development in Information Retrieval 2021.

[\[PDF\]](#)

EXPERIENCE

Mila - Quebec AI Institute - Research Intern, Chandar Lab

May 22 - Jul 22

Research Areas: Multi-Agent Reinforcement Learning, Curiosity based Learning *Advisor:* [Prof. Sarath Chandar](#)

- Worked on **intrinsic motivation and curiosity** in multi-agent reinforcement learning to solve problems of non-stationarity and multi-observation variance in centralized training decentralized execution.
- Developed a framework, exploiting the difference in global and local state values as intrinsic rewards.
- Contributed to [RLHive](#): a singular reinforcement learning framework for single and multi-agent training.

University of Washington - Research Intern, Personal Robotics Lab

Apr 21 - Jan 22

Research Areas: Human-Robot Interaction, Social Navigation

Advisor: [Prof. Siddhartha Srinivasa](#)

- Currently exploring the transfer of performance of **models in human motion prediction [1]** to safety and efficiency in model predictive controllers for robot navigation in crowded and challenging scenarios.
- Proposed **T-MPC [2]**, a topologically compliant MPC for safer and adaptive control in crowd navigation.
- Demonstrated and tested the robustness and safety of the framework in **real-world experiments using the Honda P.A.T.H Bot**, running lab trials with humans navigating around the robot in challenging interactions.

Adobe Inc. - Research Intern, Media and Data Science Research

May 21 - Jul 21

Research Areas: Continual Learning, Topology based Learning

Team: [Media and Data Science Research Lab](#)

- Trained a **lifelong learning agent** to generate action representations and policy across environments with dynamic action spaces, such as offers in marketing campaigns and content on a recommender system.
- Proposed **TRACE [3]**, topology preserving and reward aware action representations in lifelong learning agents for efficient transfer of performance across the changing action spaces in these environments.

Kharagpur RoboSoccer Students Group - Humanoid Team Lead

Apr 20 - May 22

Research Areas: Humanoids, Inverse Kinematic Control, Evolutionary Learning

- Developed a **cooperative multi-agent system** of autonomous humanoid agents capable of playing soccer.
- Optimized the parameters of the inverse kinematic walk-engine using evolutionary learning; **increasing speed of the humanoid from 5m/s to 9.5m/s**. Proposed an end-to-end walk engine for Nao bots using RL.

The Cornell, Maryland, Max Planck Pre-doctoral Research School 2022 Attendee

August 2020

Attended a summer school at MPI-SWS in Saarbruecken, Germany, including lectures from and interactions with professors doing state-of-the-art research across domains like machine learning and user privacy.

OUTREACH AND SERVICE

Reinforcement Learning, IIT Kharagpur - Teaching Assistant

Fall 2022

Mentoring 30+ students on the term projects. Delivered course lectures Multi-Agent Reinforcement Learning.

Robotics Reading Group, IIT Kharagpur - Organizer

Spring, Fall 2020

Organised reading group on foundational and recent research on robotics, motion planning, and robot learning.

IEEE Winter School, IIT Kharagpur - Student Mentor

Fall 2019

Mentored students at IIT Kharagpur in a week-long boot camp for image processing and machine learning.

Code Club, IIT Kharagpur - Student Coordinator

Fall 2018

Organized up.AI 2018, an event dedicated to AI for Social Good in association with Intel and other tech giants.

PROJECTS

Scalable Robotic Warehouses [\[Report\]](#)

Guide: [Prof. Partha Pratim Chakrabarti](#)

- Working on learning policies for large-scale warehouse systems involving pickup and drop tasks.
- Exploring transfer of a policy over-limited agents to large-scale systems using scene decomposition.

Web Interface for NLI Proof Generation [\[Demo\]](#)

Design Lab Project, Fall 2022

- Created a web interface *Generating Intermediate Steps for NLI with Next-Step Supervision*, Ghoshal, et al.
- Implemented a deployable framework for this research done at Microsoft India.

Gaussian Processes for Trajectory Prediction [\[Report\]](#)

AI Course Term Project, Fall 2021

- Built Gaussian process-based models for predicting human trajectories in real-world human datasets.

Reproducibility Challenge: Average Policy Optimization [\[Report\]](#)

RL Course Term Project, Fall 2021

- Reproduced the results and verified claims for the paper published in IJCAI 2021.

Accelerating Graph Algorithms on GPUs [\[Report\]](#)

HP Computing Course Project, Spring 2021

- Wrote CUDA code for algorithms such as BFS, and DFS on GPUs, improving performance on large-scale graphs.

Incompatible Control with Transformers

Guide: [Dr. Fabio Pardo](#)

- Built zero shot control transfer across robot morphologies using Transformers and Graph Grammar.

ACHIEVEMENTS

CMMRS 2022 - Received full funding to attend summer school at the Max Planck Institute in Germany.

RoboCup 2022 - Among the top 10 teams in the world to qualify for Humanoid 3D simulation League.

MITACS Globalink and DAAD-Wise - Awarded funding for research at labs in Canada and Germany.

IBM Green Hack - Awarded the first position at the IBM Green Hack 2020, a hackathon on climate change.

Competitive Examinations - In the top 0.2% in JEE Advanced and top 0.1% in JEE Mains, among all students.

KVPY Scholarship - Awarded the prestigious fellowship by the Government of India.