Anusha Srikanthan

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Interests Robotics, Layered Control, Multiagent systems, Learning for Dynamics and Control

Education

University of Pennsylvania (GRASP) — Philadelphia, Pennsylvania
PhD in Electrical and Systems Engineering — August 2021 – Present
Mentors: Dr. Nikolai Matni, Dr. Vijay Kumar *GPA: 3.83.*

Georgia Institute of Technology — Atlanta, Georgia
M.S. Thesis in Electrical and Computer Engineering — August 2019 – July 2021
Mentors: Dr. Harish Ravichandar, Dr. Sonia Chernova *GPA: 3.90.*

National Institute of Technology, Trichy — Tamilnadu, India
B. Tech (Hons) in ECE, Minor in Computer Science — July 2015 – May 2019
Mentors: Dr. P. Palanisamy, Dr. Varun Gopi. *GPA: 9.15/10.*

Industry experience

Cruise LLC (Remote)
AI Robotics, PhD intern — Summer 2024
Identified the challenges of lack of interpretability of model outputs and label quality in their current framework. Proposed a new loss function based on task-specific metrics from observing the correlation trends of metrics through experiments. Conducted performance evaluations of the trained models to improve the interpretability (project report).

Inspirit AI (Remote)
Instructor — Summer 2023
As an AI instructor, I taught concepts of machine learning and basics of Python programming to high school students.

NVIDIA Graphics Pvt Ltd (Bengaluru, India)
SOC Design Hardware Engineering internship — Summer 2018
Designed and implemented a Safety Duplication Plugin for multiple error detection using concepts of redundancy and clock domains and integrated it on Perforce using Perl scripts with Viva embedded code programmed on a UNIX based OS. (project report).

Research experience

A Layered Control Architecture for Safe Real-Time Navigation (GRASP Lab)
Nikolai Matni, Nadia Figueroa (University of Pennsylvania) — Nov 2023 – Present
Derived a model-based layered control architecture for dynamically feasible, real-time planning of a differential drive mobile robot (Fetch). Implemented a real-time control barrier function controller to modify the nominal controller to safely avoid static and dynamic obstacles while guaranteeing convergence to a goal (arxiv).

Data-driven Trajectory Optimization for Quadrotor Systems (GRASP Lab)
Nikolai Matni, Vijay Kumar — Apr 2022 – Present
Derived a hierarchical approach to trajectory optimization and feedback control for general nonlinear dynamical systems with guarantees on convergence of the tracking error. Applied to a Crazyflie 2.0 and Dragonfly quadrotor platform showing significant improvements in tracking error by offseting aerodynamic drag (IROS 2023 and arXiv).

Resilient Coalition Formation in Robot Teams via Imitation Learning
GRASP Lab (UPenn), STAR Lab (Georgia Tech) Aug 2021 – May 2022
Interpretable and self-supervised learning-based approach to coalition formation for robots operating under environmental disturbances (IROS 2021 Workshop). *Won the Excellent Paper Award!*

Imitation learning of Task Requirements for Multi-agent systems
Harish Ravichandar, Sonia Chernova (MS Thesis) Jan 2020 – Aug 2021
Established the research problem for using expert demonstrations to learn different strategies for complex tasks and perform multi-robot task assignment (ST-MR-IA) with heterogeneous agents. Formulated a discrete optimization algorithm using CPLEX and Python to tackle multi-modality in task requirements, verified by designing battle scenarios on the latest release of StarCraft II Editor and with tasks on the Robotarium Simulator (AAMAS 2022 and RSS 2023).

Seminar Talks

Invited talk at Microsoft Research NYC
Layered Control Architectures for Underactuated Robotic Systems Mar 2024
Invited talk at ThirdWave Innovation
Nonlinear Layered Control Architectures for Trajectory Optimization Oct 2023
Invited seminar at Caltech
Data-driven Synthesis of Dynamics-Aware Trajectory Generation August 2023

Service

Conference and Journal Paper Reviewer Oct 2022 - present
IUCAS 2022, ICRA 2023, AAAI 2024-25, IEEE-TVT Journal, IEEE-RAL Journal, L4DC 2024.
Teaching Assistant at Penn
Worked as an instructional staff with Dr. Dinesh Jayaraman for CIS 521: *Applied Machine Learning*, with Dr. Nikolai Matni for ESE 204: *Decision Models* and with Dr. Santosh Venkatesh for ESE 5300: *Elements of Probability Theory and Applications*
President of ESE PhD Association, UPenn July 2022 – July 2024
As the President of the ESE PhD Association, I managed our team of PhD students volunteering to organize professional development and social events.
President of Dance Troupe of NIT Trichy, India Jul 2016 – May 2019
As the President of NIT Trichy's Dance Troupe, I led 50 students across two troupes (Indian Classical and Western) in various inter-collegiate dance competitions across the country.
Illuminate – Non-profit Educational Organization Jul 2016 – May 2019
As a volunteer at Illuminate (NGO), I handled Math and English classes for underprivileged kids from Grade 6 and 7.

Awards

PhD Good Citizen award (University of Pennsylvania) 2023
IROS 2023 Travel award grant 2023
Excellent paper award (IROS 2021 Workshop) 2021
Dean's Fellowship (University of Pennsylvania) 2021
Graduate Research Assistantship (Georgia Institute of Technology) 2020
Won Second Place in Sangam (Robotics event) held at Pragyan (NIT Trichy, India) 2017