Anusha Srikanthan

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Research interests

Robotics, 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.*

Honors and scholarships

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 (Technical Competition) held at Pragyan (NIT Trichy, India) 2017

Publications

Augmented Lagrangian Methods as Layered Control Architectures
Anusha Srikanthan, Vijay Kumar, Nikolai Matni
American Controls Conference, 2024 submitted

A Data-Driven Approach to Synthesizing Dynamics-Aware Trajectories for Underactuated Robotic Systems
Anusha Srikanthan et al.
International Conference on Intelligent Robots and Systems, 2023

Concurrent Constrained Optimization of Unknown Rewards for Multi-Robot Task Allocation
Sukriti Singh, **Anusha Srikanthan**, Vivek Mallampati, Harish Ravichandar.
Robotics Science and Systems, 2023

Resource-Aware Adaptation of Heterogeneous Strategies for Coalition Formation
Anusha Srikanthan, Harish Ravichandar.
Autonomous Agents and Multiagent Systems, 2022 Extended Abstract.

Research experience

Synthesizing Dynamically Feasible Trajectories with Convergence Guarantees (GRASP Lab)

Nikolai Matni, Vijay Kumar (University of Pennsylvania) Apr 2022 – Present

Derived a hierarchical approach to motion planning for general nonlinear dynamical systems with guarantees on convergence of the tracking error.

Resilient Coalition Formation in Heterogeneous Teams via Imitation Learning (GRASP Lab)

Nikolai Matni, Vijay Kumar (University of Pennsylvania) Aug 2021 – Present

Interpretable and self-supervised learning-based approach to coalition formation for robots operating under environmental disturbances. Summary of findings available here.

Learning Task Requirements for Coalition Formation from experts

Harish Ravichandar, Sonia Chernova (Georgia Tech) 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 and simulated 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. Summary of findings available here.

Industry experience

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. Formalized hierarchical changes in the internal architecture of the IP module for making it plugin compatible which increases the safety compliance at the hardware level to prevent failure when the chip is used in self-driving cars. Report summary.

Teaching experience

Instructor at Inspirit AI, Summer 2023

As an instructor, I taught machine learning and basics of Python programming to high school students

Teaching Assistant, Spring 2023

Worked as an instructional staff with Dr. Dinesh Jayaraman for CIS 521: *Applied Machine Learning*

Teaching Assistant, Fall 2022

Worked as an instructional staff with Dr. Santosh Venkatesh for ESE 5300: *Elements of Probability Theory and Applications*

Talks and tutorials

Nonlinear Layered Control Architectures for Trajectory Planning in Underactuated Robotic Systems October 2023
Invited talk at ThirdWave Innovation

Data-driven Synthesis of Dynamics-Aware Trajectory Generation for Underactuated Robots August 2023
Invited seminar at Caltech

Resource-Aware Adaptation of Heterogeneous Strategies for Coalition Formation May 2022
Presented our paper at the poster session, AAMAS 2022, Remote

Resilient Coalition Formation in Heterogeneous Teams via Imitation Learning Sep 2021
IROS Workshop: Cognitive and Social Aspects of Human Multi-Robot Interaction, Prague and Remote

Software Projects

Visual Object Detection System (Brain Corp) Feb 2020
Ideated and implemented an object detection system to locate a phone in each image of a dataset using Template Matching.

Transfer Learning for Damage Detection using VGG16 Spring 2020
Engineered a solution using state-of-the-art CNN to study transfer learning by using VGG16 architecture pre-trained on ImageNet dataset to classify levels of damage in our dataset containing damaged buildings.

Multi-sensor Fusion for the Detection of Exit Lanes Spring 2019
Undergraduate thesis on traffic sign and lane detection from videos using OpenCV and Unity.

Coding Projects using MATLAB, C, C++, Python and OpenCV
Visual Aid Kit using OpenCV [GitHub], Algorithm optimization in Wireless Networks, and Snake Game using OOP concepts.

Service and outreach

ESE PhD Association, University of Pennsylvania July 2022 – present
As the President of the ESE PhD Association, I managed our team of PhD students volunteering to organize professional development and social events.

2021 K-12 InVenture Prize State Finals, Atlanta Mar 2021
As a graduate student at Georgia Tech, I participated as a judge in the K-12 InVenture State Finals to evaluate the science exhibition presentations from middle school and high school kids.

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.