Prashanth Ravichandar

rprash99@gmail.com | (213) 561-8227 | LinkedIn | Github | Website

Education

University of Southern California August 2022 – May 2024
M.S. in Computer Science (Honors) *4.0/4.0*

Indian Institute of Technology Guwahati 2016 – 2020
B.Tech. in Engineering Physics, Minor in Computer Science and Engineering *9.11/10.00 (DR 1)*

Experience

Student Researcher - Dynamic Robotics and Control Laboratory, USC July 2023 - Present
Mentor: Prof. Quan Nguyen *Los Angeles*

- Enhancing exploration and planning efficiency for complex, unseen tasks through reinforcement learning.
- Developing a task planner for agile locomotion in bipedal robots using a pre-trained low-level controller.

Research Intern - Robotic Embedded Systems Laboratory, USC June 2023 - Present
Mentor: Prof. Gaurav Sukhatme *Los Angeles*

- Working on small and efficient neural network policies for memory-constrained robots.
- Exploring parameter prediction for visual control policies using transformer-based graph hypernetworks and RL.

Senior Technology Associate August 2020 – July 2022
Morgan Stanley *Mumbai*

- Analysed distributed in-memory caching solutions, with Redis and Apache Ignite, to speed up risk calculations.
- Developed .NET Core application using microservices architecture as part of the mortgages team. Adopted domain-driven design to upgrade existing monolithic architecture to microservices-based architecture.

Research Intern - Indian Institute of Science May – August 2019
Mentor: Prof. Aditya Gopalan *Bengaluru*

- Investigated the problem of sequential detection of change in the distribution of data with adaptive measurements.
- Performed a literature survey along with a preliminary problem formulation, in the context of multi-armed bandits.

Projects

Controller for Unitree A1 Quadruped Robot Jan 2023 – May 2023
Course Project: Robot dynamics and control *Github link*

- Designed controllers for Unitree A1 quadruped robot in MATLAB Simscape to perform walking, turning, running, stair climbing and obstacle avoidance.
- Developed and implemented QP and MPC controllers, trotting gait sequence, a linear trajectory for walking, a cycloid trajectory for running and a 5th-order polynomial trajectory for stair climbing.

Masked Autoencoders for Adversarial Purification Jan 2023 – May 2023
Course Project: Deep Learning and its Applications *Github link*

- Designed and implemented an adversarial image purification model using fine-tuned Masked Autoencoders (MAEs) to restore perturbed images to their original form, rendering adversarial attacks ineffective.
- Conducted experiments on the ImageNet dataset, successfully mitigating adversarial attacks generated by Gaussian noise and the Fast Gradient Sign Method (FGSM).

Analysis of Surface Names for entities in Wikipedia July 2019 – June 2020
Bachelor's Thesis under Prof. Amit Awekar, Dept. of CSE, IIT Guwahati *Github link*

- Analyzed the characteristics of incorrectly mapped links in Wikipedia pages and explored solutions to correct them.
- Created a novel dataset to aid in further research to provide contextual information of errors.

Atari Pong - OpenAI gym *Github link*

- Trained an agent to play the Atari game - Pong, using policy gradients, with raw game pixels as input.

Line Follower Robot March 2017
TechKriti, IIT Kanpur

- Led the development of a line follower robot using an Arduino board and a PID controller.

Key courses

Mathematics: Linear Algebra, Advanced Calculus, Graphs and Matrices
Computer Science: Analysis of Algorithms, Computer Systems, Computer Architecture, Software Engineering
Artificial Intelligence: Fundamentals of AI, Machine Learning, Deep Learning, Convolutional Neural Networks (CS231n Stanford), Reinforcement Learning (David Silver), Autonomous Decision-Making*
Robotics: Robotics, Robot Learning, Robot Dynamics and Control
Miscellaneous: Game Theory, Computational Physics * : Ongoing

Technical skills

Languages: Python, JavaScript, C++, C, MATLAB, C#, SQL, TypeScript, HTML/CSS, LaTeX
Libraries/Frameworks: PyTorch, MuJoCo, JAX, ROS, Nvidia Isaac Gym, Pandas, NumPy, Matplotlib, Scipy, Flask, Angular
Tools: Docker, Git, Linux

Achievements

- **USC Computer Science Master's Honors Program**: Selected for the honors program for maintaining a GPA of 3.9 and above.
- **Institute Silver Medal 2020**: Received the Institute Silver Medal for securing **1st rank** in the Department of Physics, IIT Guwahati
- **Institute Merit Scholarship, IIT Guwahati**: Received a scholarship for best academic performance in the class in the academic year 2018-19
- **Inter IIT Tech Meet 2018**: Secured **Bronze medal** in the Star Cluster Identifier event, amongst the 23 IITs participating
- **M.P.Birla Institute of Fundamental Research**: Graded excellent at the Summer School in Astronomy & Astrophysics, 2014
- **Hindustani Talavadya Junior Grade in Tabla - 2012**: Secured first class
- **21st National Chess Championship - 2007**: Ranked 158 on the merit list in the Under 9 category

Extracurricular activities

Viterbi Graduate Mentor, USC *Jan 2023 - Dec 2023*

- Mentored 3 Master's students over the spring and fall semesters. Helped new graduate students adjust to life at USC and provided guidance on achieving academic and professional goals. Nominated for the **Outstanding Mentor Award**.

Club Secretary, Astronomy Club, IIT Guwahati *April 2018 - 2019*

- Supervised the financial and technical planning and growth of the club. Led the development of projects including constructing a planetarium, astronomical data analysis, star spectroscopy, space balloon, and radio astronomy.

Organizer, Techniche, IIT Guwahati *September 2016 - 2017*

- Organized the Exhibitions and Industrial Conclave modules of the annual techno-management festival. Interacted with prominent industrialists from Bosch, IBM, and Dell as well as several research groups from USA, Bangladesh and India.

Volunteer, Prashanthi Balamandira Trust *October 2015 - Present*

- Participated in several activities such as serving breakfast to children at government schools, providing COVID relief kits in slums, developing a website to help deliver free educational content, and translating Sanskrit verses from ancient Indian texts.