

# Prashanth Ravichandar

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## EDUCATION

### University of Southern California

*M.S. in Computer Science (Honors)*

August 2022 – May 2024

4.0/4.0

### Indian Institute of Technology Guwahati

*B.Tech. in Engineering Physics, Minor in Computer Science and Engineering*

2016 – 2020

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

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**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

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**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

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- **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

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**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.