

# Shreyas Agarwal

772 B 5<sup>th</sup> street, Secaucus, NJ 07094

201-334-8959

[shrey15@berkeley.edu](mailto:shrey15@berkeley.edu)

<https://shreyas1230.github.io/>

<https://github.com/shreyas1230>

<https://www.linkedin.com/in/shreyas-agarwal/>

## SUMMARY

- Proficient in machine learning and deep reinforcement learning with experience in data structures and algorithms
- Skilled in robotics sensing, actuation, control, and path planning
- Experienced in leading teams to implement applications and to participate in competitions

## EDUCATION

### University of California, Berkeley

B.S. in Electrical Engineering and Computer Science | GPA: 3.986/4.000

EECS Honors Program - Physics Breadth

**Berkeley, CA**

*August 2017– August 2020*

#### Selected

Machine Learning, Deep Reinforcement Learning, Robotics, Probability and Random

#### Coursework:

Processes, Data Structures and Algorithms, Signals and Systems, Feedback Control Systems

## TECHNICAL SKILLS

Programming: Python, Java, C, Scala, Javascript, Scheme, SQL, Arduino

Libraries: NumPy, PyTorch, TensorFlow, Scikit-learn, SciPy, OpenMP, OpenAI Gym

Operating systems: Windows, Linux, Robot Operating System (ROS)

Others: GitHub, Laser Cutting, 3D Printing, LaTeX, Adobe Illustrator

## RESEARCH

### UC Berkeley AI Research

**Berkeley, CA**

*It Is Not the Journey but the Destination: Endpoint Conditioned Trajectory Prediction ([Link](#)) Fall 2019 – Fall 2020*

*Project Lead: Prof. Jitendra Malik; Ph.D. Mentor: Karttikeya Mangalam*

- Worked on a research project to predict pedestrian trajectories with applications in self driving cars
- Researched inverse optimal control methods such as Generative Adversarial Imitation Learning
- Worked on several generative models such as GANs and its variants to better capture multimodal path distributions
- Achieved state-of-the-art results and accepted to the European Conference on Computer Vision (ECCV) 2020 as an oral publication

### UC Berkeley, Electrical Engineering and Computer Science Department (EECS)

**Berkeley, CA**

*Decentralized Robotic Swarm ([Link](#))*

*Spring 2020*

- Implemented, using Python's threading module, and verified proof of correctness of Wang and Rubenstein's "Shape Formation in Homogeneous Swarms Using Local Task Swapping"
- Researched into extending swarm control from discrete to continuous space using a linear dynamics model while maintaining collision free and deadlock free guarantees

### UC Berkeley, Undergraduate Research Apprenticeship Program

**Berkeley, CA**

*Team Member*

*Fall 2019*

- Worked in a team to develop an algorithm that improved performance of gravitational lens finding software
- Researched on ADDA, a state-of-the-art technique for transfer learning that can generalize existing models to new and unseen conditions through generative modeling

## EXPERIENCE

### Microsoft – Semantic Machines

**Berkeley, CA**

*Software Engineering Intern*

*Summer 2020*

- Improved robustness of chatbot SDK by supporting machine learned features using Scala, Javascript, and Typescript
- Enhanced the interface between the current chatbot model and Microsoft's LUIS machine learning service by enabling the chatbot to process more advanced LUIS entities

**UC Berkeley, Space Technologies at Cal****Berkeley, CA***Team Member**Fall 2019*

- Worked in a team to design a CubeSat satellite to analyze quantum gyroscopes and their use in microgravity
- Helped create a proposal for the project and managed power systems and budget

**UC Berkeley, EECS****Berkeley, CA***Research Intern**Summer 2019*

- Created a neural network to factorize a product of two prime numbers
- Experimented with several kinds of optimizers such as AdaGrad and RMSprop
- Implemented first in TensorFlow and then reconstructed the architecture in PyTorch with CUDA support

**Eta Kappa Nu (EECS Honor Society)****Berkeley, CA***Officer, Bridge Department**Fall 2018 – Spring 2019*

- Hosted review sessions for EECS courses, collected data and updated course guides and exam archives, assisted students in understanding course material, and volunteered during annual EECS day

**UC Berkeley EECS Department****Berkeley, CA***Academic Intern, CS61B-Data Structures**Fall 2018 – Spring 2019*

- Helped students understand concepts and guided them through projects & labs

**RELEVANT PROJECTS****UC Berkeley, Electrical Engineering and Computer Science Department (EECS)****Berkeley, CA***Aimbot: Target Tracking and Shooting Robot**Fall 2019*

- Optimized image segmentation algorithm to accurately identify, track, and shoot a target's center
- Used ROS and MoveIt package to integrate object detection with path planning of the robot's arm trajectory

*Canny Edge Detector**Summer 2019*

- Implemented Canny Edge Detection, a popular multistage algorithm used for edge detection purposes
- Used real life as well as synthetic images on implemented versions of noise reduction with a Gaussian kernel, intensity gradient detection, non-maximum suppression, and hysteresis thresholding algorithms

*Robomasters**Spring 2019*

- Used OpenAI gym environment to simulate a game in which a robot would shoot at enemies
- Used Python to build a risk-based decision model in which the robot made informed decisions by choosing from a set of actions given inputs from various sensors

*Convolutional Neural Network Image Classification**Spring 2019*

- Used Python and PyTorch to train a convolutional neural network (CNN) on a large dataset of images of different exercise poses and classified test images based on what exercises the pose was from
- Modeled a framework similar to AlexNet with 6 convolutional layers, 3 max pooling layers, and 2 fully connected layers

**AWARDS AND ACHIEVEMENTS**

- Highest Honors in EECS (Top 3% GPA)

*August 2020*

- Arthur M. Hopkin Award – Awarded for high academic achievement

*Spring 2019*

- Dean's List – Awarded for GPA in the top 10 percent of all EECS undergraduates

*Fall 2017 – August 2020***ADDITIONAL INFO**

- Cal Hacks – World's largest collegiate hackathon
- International Collegiate Programming Contest (ICPC) – North American Qualifier
- Particle Physics Research Group at ULAB, Physics & Astronomy Division
- Language Proficiencies: English, Hindi, Spanish, German
- Cal Hurling Club, Intramural Soccer

*Fall 2018, Fall 2019**Fall 2018**Spring 2018*