

Shreyas Agarwal

shrey15@berkeley.edu | <https://github.com/shreyas1230>

772 B 5th street, Secaucus, NJ 07094

(201) 334-8959

<https://www.linkedin.com/in/shreyas-agarwal-086267146>

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 *Fall 2018, Fall 2019*
- International Collegiate Programming Contest (ICPC) – North American Qualifier *Fall 2018*
- Particle Physics Research Group at ULAB, Physics & Astronomy Division *Spring 2018*
- Language Proficiencies: English, Hindi, Spanish, German
- Cal Hurling Club, Intramural Soccer