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Marvin Zhang

Education

University of California, Berkeley 2012 - 2016
Bachelor of Arts, Computer Science GPA: 4.00

Awards & Honors

UC Berkeley Letters and Science Dean's Honor List	December 2012 - May 2015
UC Berkeley Kraft Award for Freshman	December 2012
Upsilon Pi Epsilon, Computer Science Honor Society	December 2013 - present
President, The Music Connection at UC Berkeley	May 2014 - May 2015
UC Berkeley EECS Honors Degree Program	August 2014 - present
Undergraduate Research Apprentice Program Summer Stipend Award	May 2015 - August 2015
Quantedge Award for Academic Excellence	October 2015
CRA Outstanding Undergraduate Researchers Award Honorable Mention	December 2015
UC Berkeley EECS Warren Dere Design Award	April 2016
UC Berkeley Outstanding Graduate Student Instructor Award	May 2016

Publications

Marvin Zhang, Zoe McCarthy, Chelsea Finn, Sergey Levine, Pieter Abbeel.
Learning Deep Neural Network Policies with Continuous Memory States.
IEEE International Conference on Robotics and Automation (ICRA), 2016. arXiv 1507.01273.
Presented at the NIPS Reasoning, Attention, Memory (RAM) Workshop, 2015.
Presented at the NIPS Deep Reinforcement Learning Workshop, 2015.

Research

Research Assistant, UC Berkeley Robot Learning Lab (January 2014 - present)
Working under the mentorship of Professor Pieter Abbeel and post-doctoral researcher Sergey Levine. Currently working on several projects focused on improving deep learning for robotic control, through incorporating memory capabilities into control policies and exploring new robotic domains.

Research Projects

Learning Deep Neural Network Policies with Continuous Memory States (rll.berkeley.edu/gpsrnn)
In this project, we investigated how to best incorporate memory capabilities into deep learning methods for robotic tasks. We devised an approach of appending memory states to the physical state of the system, and allowing the policy to directly read from and write to these memory states. By combining this approach with the guided policy search algorithm, we were able to acquire policies with effective memorization and recall strategies.
Highlights: This work has been written into a paper, accepted for ICRA 2016 and also available on arXiv.

Learning Locomotion Policies for the NASA SUPERball (in progress)
In this project, we are collaborating with NASA Ames to explore the challenge of learning locomotion strategies for the SUPERball, a tensegrity robot that is being developed for planetary exploration missions. Learning locomotion is more robust and generalizable to new situations, and would allow for more autonomy for the SUPERball in new and unfamiliar environments.

Software Projects

Guided Policy Search (rll.berkeley.edu/gps)
A standardized, open-source implementation of the guided policy search algorithm, developed by myself and several members of the UC Berkeley RLL. Full citation:

Chelsea Finn, Marvin Zhang, Justin Fu, Xin Yu Tan, Zoe McCarthy, Emily Scharff, Sergey Levine.
Guided Policy Search Code Implementation. 2016. Software available from rll.berkeley.edu/gps.

parRL (github.com/zhangmarvin/parRL)
Framework for parallelizing reinforcement learning algorithms. Developed by myself, PhD student John Schulman, and Professor Pieter Abbeel in the UC Berkeley RLL.

Teaching

CS 189/289A Teaching Assistant, UC Berkeley (Spring 2016)
Currently a Teaching Assistant for CS 189/289A, Introduction to Machine Learning, with Professor Jonathan Shewchuk. Duties include teaching sections, holding office hours, and writing and developing course materials.

CS 188 Teaching Assistant, UC Berkeley (Fall 2015)
Formerly a Teaching Assistant for CS 188, Introduction to Artificial Intelligence, for one semester, with Professor Stuart Russell and instructor Pat Virtue. (Teaching rating: 4.9/5.0)
Highlights: Helped design, develop, and lead supplementary probability sections for students. Also spearheaded the redesign of a project centered around probabilistic inference, HMMs, and particle filtering.

CS 61A Teaching Assistant, UC Berkeley (Spring 2014, Fall 2014, Spring 2015)
Formerly a Teaching Assistant for CS 61A, Structure and Interpretation of Computer Programs, for three semesters, with Professors John DeNero and Paul Hilfinger. (Average teaching rating: 4.83/5.0)
Highlights: Taught several guest lectures on topics such as object-oriented and logic programming, and reinforcement learning. Also developed a new project, with another TA, centered around introductory ideas in machine learning.

Software Projects

Yelp Maps (cs61a.org/proj/maps)
Project written for CS 61A to introduce students to introductory topics in machine learning, such as k-means clustering and linear regression. Developed with fellow Teaching Assistant Brian Hou and Professor John DeNero.

Industry

Engineering Intern, Prism Skylabs (June - August 2013)
Interned at Prism Skylabs, an SF-based startup working on computer vision and video imagery analysis. Primary project was complete overhaul, both backend and frontend, of one of their web apps, the iDashboard. Useful in picking up new programming tools and skills including Django, PyCharm, and PostgreSQL.