

Edward S. Hu

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RESEARCH INTERESTS

Robotics, Reinforcement Learning, Imitation Learning, Perception, Reasoning

EDUCATION

University of Southern California Aug 2019 – May 2020

M.S. in Computer Science

Robert Fulton Scholarship, GPA: 3.57/4.0

University of Southern California Aug 2015 – May 2019

B.S. in Computer Science

Cum laude, GPA: 3.56/4.0, Discovery Scholar Distinction

RESEARCH EXPERIENCE

USC Cognitive Learning for Vision and Robotics Lab May 2018 – Present

Research Assistant, Professor Joseph Lim

- **Robot Learning:** Enabling physical robots with machine learning. Research on reinforcement learning, imitation learning, predictive models, and robotics.

Intel May 2017 - Aug 2017

Machine Learning Intern, Dr. Helin Cao

- **Applied Reinforcement Learning:** Automated thermal tuning process for laptops CPUs via machine learning. Explored model-free and model-based reinforcement learning algorithms.

USC Wireless Devices and Systems Group May 2016 – Aug 2017

Research Assistant, Professor Andreas Molisch

- **Viterbi Virtual Cache:** Developed data collection tools for study on user media caching. Implemented video player application for Android and server for storing user data.

PUBLICATIONS

Y Lee, **ES Hu**, Z Yang, A Yin, JJ Lim, “IKEA Furniture Assembly Environment for Long-Horizon Complex Manipulation Tasks” in *Arxiv Preprint*, 2019.

Y Lee, **ES Hu**, Z Yang, JJ Lim, “To Follow or not to Follow: Selective Imitation Learning from Observations,” in *Conference on Robot Learning*, 2019.

Y Lee, SH Sun, S Somasundaram, **ES Hu**, JJ Lim, “Composing Complex Skills by Learning Transition Policies” in *International Conference on Learning Representations*, 2019.

PROFESSIONAL EXPERIENCE

Tesla May 2018 - Aug 2018

Software Engineering Intern

- **Model 3 Production Optimization with NLP:** Created NLP classification pipeline to triage and classify 200,000 Model 3 Production issues
- **Manufacturing Operating System (MOS):** Fullstack implementation of mission-critical production dashboards on MOS using Angular, Go, and SQL

Flo Technologies May 2016 - Aug 2016

Software Engineering Intern

- **Mobile Development:** Developed IoT iPhone application that controls smart plumbing device. Used MQTT, Swift, and Firebase frameworks to connect smart devices with the iPhone.

Code The Change May 2015 - Present

Technical Lead

- **Coding for Social Good:** Student organization that builds software products for LA nonprofits on a yearly cycle. Products are built through agile development.
- **Technical Leadership:** Plan software architecture, set up boilerplate, review pull requests, and pair program with junior developers.

AWARDS

Robert Fulton Scholarship	<i>May 2019</i>
Discovery Scholar (Undergraduate Research) Distinction	<i>May 2019</i>
Best Writeup and Best Demo, CS599 Final Project	<i>May 2018</i>
1st Place, HackForHealth	<i>Apr 2017</i>
1st Place, Bit Shift Programming Contest, CS356	<i>Jan 2017</i>
Dropbox Challenge Winner, Stanford Treehacks	<i>Feb 2016</i>
1000 Pitches Winner	<i>Dec 2015</i>

OUTREACH AND NONPROFIT WORK

Girls Empowerment Day	Dec 2019
<i>Robotics Presenter</i>	
○ Virtual Reality Demo: Implemented virtual reality controller augmented inverse kinematics controllers for simulated Baxter robot. Presented and demoed robot control to 70 local high school girls.	
Hour of Code	Dec 2016 - Dec 2017
<i>Instructor</i>	
○ K12 Code Mentoring: Participated as a coding instructor in Hour of Code, a yearly event that introduces kids to code. Taught 4 K12 kids how to implement simple games in Scratch and Java.	
MedMind	Aug 2018 - May 2019
<i>Founder, Technical Lead</i>	
○ Medication Management: React Native app that uses computer vision to streamline drug management for cancer patients. Worked with local nonprofit CancerBase and tested with cancer patients.	
LA Data Dashboard	Aug 2017 - May 2018
<i>Technical Lead</i>	
○ Open Data Initiative: Dashboard that displays real-time metrics such as emergency response time, jobs added per quarter, etc. for the public to use. Collaborated with the LA Mayor's department, and dashboard is used by the mayor.	
Rudi the Chatbot	Aug 2016 - Dec 2016
<i>Software Developer</i>	
○ Recidivism Reduction: Chatbot that provides real-time housing and legal information to released LA inmates to reduce recidivism rates. Collaborated with LA nonprofit Center for Health Justice for testing.	

PROJECTS

- Research Blog:** Post tutorials, paper summaries, and articles on machine learning research. Viewed by over 10,000 readers from 11 countries. <https://www.edwardshu.com>
- Deep Symphony:** Generated classical music with neural networks for CS599 final project. Explored RNN, word2vec embeddings, seq2seq, WGAN, SeqGAN. Won 1st place in class of 250 graduate students in best demo and best writeup categories.
- GPT-2 Slackbot:** Chatbot that utilizes OpenAI's powerful GPT-2 language model to converse with users.

CLASSES AND SKILLS

- Classes:** Multivariate Calculus, Linear Algebra, Probability/Statistics, Data Structures, Algorithms, Graphics, Videogame Programming, Operating Systems, Professional C++, Artificial Intelligence, Deep Learning (grad), Machine Learning (grad), Robotics (grad)
- Languages / Skills:** Python, Java, C++, Javascript, Pytorch, Tensorflow, Numpy, Node.js, React (Native), Swift, Android, SQL, Mongo