Anthony Liang

CONTACT INFORMATION

Website: aliang8.github.io *Github:* github.com/aliang8
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EDUCATION

University of Michigan - Ann Arbor Expected 2021
Masters of Science in Robotics with focus in Deep Reinforcement Learning

University of Michigan - Ann Arbor Sep 2017 - May 2020
Bachelor of Science in Engineering, Minor in Mathematics GPA: 3.562/4.000

Stuyvesant High School, New York City, New York Sep 2013 - June 2017
Diploma with Advanced Designation in Mathematics and Science

RELEVANT COURSEWORK

Advanced Topics in Computer Vision (IP) • Deep Learning for Natural Language Processing • Math for Robotics (IP) • Reinforcement Learning (Audit) • Deep Learning for Vision • Autonomous Robotics Laboratory • Mobile Robotics • Self Driving Cars: Perception and Control • Probability Theory • TechLab at MCity • Operating Systems • Information Retrieval • Numerical Methods

CONFERENCE PAPERS

Wilka Carvalho, Anthony Liang, Kimin Lee, Sungryull Sohn, Honglak Lee, Richard L. Lewis, Satinder Singh. *"Reinforcement Learning for Sparse-Reward Object-Interaction Tasks in First-person Simulated 3D Environments."* Submitted to ICLR 2021

WORKSHOP PROCEEDINGS

Wilka Carvalho, Anthony Liang, Kimin Lee, Ryan Krueger, Richard L. Lewis, Satinder Singh, Honglak Lee. *"Efficiently Learning to Perform Household Task with Object-oriented Exploration."* NeurIPS Black In AI 2019 Workshop (Oral Presentation)

Wilka Carvalho, Anthony Liang, Kimin Lee, Sungryull Sohn, Richard L. Lewis, Satinder Singh, Honglak Lee. *"ROMA: A Relational, Object-Model Learning Agent for Sample-Efficient Reinforcement Learning."* NeurIPS Deep Reinforcement Learning 2020 Workshop (Oral Presentation)

RESEARCH EXPERIENCE

Carnegie Mellon University - Intelligent Robotics Lab May 2020 - Present
Advisor: Changliu Liu Remote due to COVID-19

- Design provably safe control architecture using Deep Reinforcement Learning for autonomous vehicles operating in dynamically changing environments
- Developed custom simulation environment using Pygame and proposed novel reward function that explicitly incorporates a safety criterion to enforce safe driving behavior

University of Michigan - Deep Learning Lab Jan 2019 - Present
Advisor: Honglak Lee
Project: Sample-Efficient Reinforcement Learning for Sequential Decision-Making Tasks

- Developed LOAD, a relational reinforcement learning agent that combines self-attention and an object-centric forward model to perform challenging long-horizon object-interaction tasks in a complex 3D virtual environment called AI2THOR
- Designed a comprehensive task database and demonstrated that LOAD, compared to baseline methods, best closes the performance gap to an oracle agent with ground-truth information

University of Michigan Hospital: Radiology Department Sep 2017 - May 2018
Advisors: Ravi Samala, Heang-Ping Chan
Project: Breast Cancer Diagnosis in Digital Breast Tomosynthesis: Multi-Stage Transfer Learning

- Developed a computer-aided system (CAD) for classifying of malignant and benign masses in digital breast tomosynthesis (DBT) using a multi-stage transfer learning approach
- Tested multi-stage transfer learning by first fine-tuning with mammography data and then with the DBT data, two-stage approach improved AUROC metric by about 6%

INDUSTRY EXPERIENCE

Invisible.ai May 2020 - Aug 2020
AI Research Intern *Remote due to COVID-19*
Mentor: Eric Danziger

- Implemented a custom version of Single Shot Detector (SSD) model for real-time barcode detection. Evaluated trained model on custom dataset of Amazon delivery boxes
- Implemented an unsupervised keypoint detection model for real-time tracking of human movement in a video stream and deployed it onto cameras that used at manufacturing facilities for social distancing monitoring

Google - Ads Quality May 2019 - Aug 2019
Software Engineering Intern *Mountain View, California*
Mentor: Nina Li

- Integrated a scalable nearest neighbor matching algorithm with Google's deep learning recommendation model and built a prototype service to demonstrate the efficacy of the system
- Developed an API service for clustering mobile browser tabs into categorical clusters
- Conducted a user study with over 60 participants to evaluate efficacy of clustering feature

Luminar May 2018 - Aug 2018
AI Engineering Intern *Palo Alto, California*
Mentor: Prateek Sachdeva, Eric Danziger

- Designed and implemented an automated training data collection and prelabeling pipeline
- Worked with deep learning models for 2D and 3D object detection and lane/road segmentation
- Implemented a sensor calibration and fusion tool to visualize low density pointclouds

Socratic (acquired by Google) May 2017 - Aug 2017
Software Engineering Intern *New York, New York*
Mentors: Shreyans Bhansali, Lili Dworkin

- Developed an open-sourced math problem solver library using object character recognition and abstract syntax tree (AST) parsing
- Moderated an open-sourced community of over 20 active contributors on Github

TEACHING EXPERIENCE

University of Michigan - Ann Arbor

EECS 498: Algorithmic Robotics	Fall 2020
EECS 504: Graduate Computer Vision (Graduate course)	Winter 2020
EECS 280: Introduction to Programming and Data Structures	Fall 2018 - Fall 2019

HONORS & AWARDS

Frederick J. Leonberger Scholar ($23,000/year)	2017 - Present
National Association for Letter Carriers Scholarship (1/4)	2017 - Present
University Honors	2017 - Present
Dean's List	2017 - Present

EXTRA-CURRICULAR ACTIVITIES

Michigan Student Artificial Intelligence Lab (Education Admin and Blog Founder)	2018 - Present
Michigan Autonomous Aerial Vehicles (Member)	2017 - 2018
New York City Math Team	2013 - 2017

SKILLS

Languages: Python, C++, Javascript
Frameworks / Tools: PyTorch, Tensorflow, NumPy, OpenCV, Pandas, Matplotlib, OpenRAVE, ROS, PCL, ReactJS, GCP, AWS