Anthony Liang

CONTACT INFORMATION

Website: aliang8.github.io
Github: github.com/aliang8
Email and User ID: aliangdw@umich.edu
Phone: 718-395-0622

EDUCATION

University of Michigan, Ann Arbor - Rackham Graduate School Sept 2020 - May 2021
Masters of Science in Robotics GPA: 4.0/4.0

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

Stuyvesant High School, New York City, New York Sept 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."* NeurIPS Deep RL 2020 Workshop, 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."* ICML Object-Oriented Learning 2020 Workshop (Oral Presentation)

RESEARCH EXPERIENCE

Carnegie Mellon University - Intelligent Robotics Lab May 2020 - Present
Advisor: Changliu Liu Remote due to COVID-19
Project: Optimal Control and Reinforcement Learning

- Developed a hierarchical framework for the safe and efficient control of autonomous vehicles (AV) operating in dynamic environments
- Proposed a novel algorithm combining optimal control and reinforcement learning to learn an optimal policy for any dynamic system. Demonstrated the efficacy of this approach on a simple AV environment built from scratch

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

- Developed a relational reinforcement learning agent that uses self-attention and learns an object-centric forward model to efficiently perform object-interaction tasks in AI2THOR, a complex 3D kitchen environment
- Built a large-scale dataset of object images and demonstrated that our learned representation encodes useful ground-truth information and facilitates efficient sequential-decision making

University of Michigan Hospital: Radiology Department Sept 2017 - May 2018
Advisors: Ravi Samala, Heang-Ping Chan

Project: Transfer Learning for Breast Cancer Diagnosis

- Developed a computer-aided system for classifying 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, improved AUROC metric by about 6% over baselines

INDUSTRY EXPERIENCE

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

- Implemented a real-time human pose detection and tracking algorithm for video data
- Deployed model onto cameras used at manufacturing facilities for social distancing monitoring

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

- Improved the retrieval stage of Google's deep recommendation model by using a fast nearest neighbor matching algorithm
- Built a service that provides query suggestions and demonstrated that the new model drastically decreased retrieval time
- Built an API service with the Chrome and Brain teams for intelligently clustering a user's mobile browser tabs

Luminar Technologies 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

PROJECTS

MRover Robotic Arm - Autonomous Robotics Major Design Experience April 2019

- Implemented a software library and web interface for a six DOF robotic arm on a space rover including forward and inverse kinematics, path planning, motion control, self and world collision avoidance, and perception for object detection

TEACHING EXPERIENCE

University of Michigan - Ann Arbor

EECS 442: Computer Vision	Winter 2021
EECS 498: Algorithmic Robotics	Fall 2020
EECS 504: Graduate Computer Vision (Graduate level)	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, Scikit-learn, Matplotlib, ROS, PCL, OpenRAVE, Git, ReactJS, AWS, Hadoop