Curriculum Vitae

Austin Nguyen | Ph.D. Computer Science Engineering Program
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Education

Doctor of Philosophy (Ph.D.) in Computer Science Engineering, ***Candidate*** August 2022 - PRESENT

University of Michigan, Ann Arbor

Advisor: Michael P. Wellman

Research: Multi-agent RL, Game Theory, Game-Solving

GPA: 4.0

BA in Computer Science, *High Distinction in General Scholarship* Aug 2017 - May 2021

University of California, Berkeley

Thesis Title: Scalable, Decentralized Multi-Agent Reinforcement Learning Inspired by Stigmergy and Ant Colonies

Advisor: Ronald S. Fearing

Department GPA: 4.0

Overall GPA: 3.92

Research Interests

Devising methods to **discover equilibria** from large games that necessitate the use of **reinforcement learning** for strategy generation with minimal computational cost and maximal sample efficiency, incorporating elements of multi-agent reinforcement learning and deep learning.

Research Papers

Nguyen, Austin A. (2021) "Scalable, Decentralized Multi-Agent Reinforcement Learning Inspired by Stigmergy and Ant Colonies." https://arxiv.org/abs/2105.03546. (Non-published)

Nguyen, Austin A, Zhu, Jerry, & Zhu, Peter. (2020) "Combining Deep Bayesian Inverse Reinforcement Learning from Preferences (B-REX) with Bayesian Robust Optimization for Imitation Learning (BROIL)" for CS285 Deep Reinforcement Learning final research paper. (Non-published)

Relevant Coursework

Advanced Artificial Intelligence - *CSE 692 University of Michigan, Ann Arbor*
Discussed and studied research papers at the forefront of the artificial intelligence field. Presented papers on offline reinforcement learning and completed a final project exploring the use of semantic, episodic, and short-term memory for embodied agents.

Deep Reinforcement Learning - *Compsci 285 University of California, Berkeley*
Learned various deep reinforcement learning algorithms and their mathematical motivations and derivations. Implemented algorithms to solve MuJoCo tasks. Designed a risk-tolerant inverse reinforcement learning framework for final research project.

Theoretical Statistics - *Statistics 210A University of California, Berkeley*
Studied material geared towards research careers in statistics and mathematical machine learning. Concepts included, but not limited to, resampling methods, hypothesis testing and statistical decision theory.

Additional Research Experience

Research Assistant Oct 2019 - May 2021

Biomimetic Millisystems Lab under Ronald Fearing, University of California, Berkeley

- Completed honors thesis on decentralized multi-agent learning using ant-inspired pheromone coordination and hierarchical reinforcement learning for multi-agent path planning and environment modification
- Designed decentralized multi-agent reinforcement learning algorithm inspired by difference rewards to improve scalability
- Used V-REP robot simulator with ROS interface in Linux (Ubuntu) environment

Research Assistant Jan 2019 - Sep 2019

Swarm Labs under Kristofer Pister, University of California, Berkeley

- Used Bayesian Optimization to determine optimal quadcopter hovering parameters for PID controller
- Implemented ensemble neural networks with PyTorch to train a model for quadcopter movement dynamics
- Designed general optimal PID parameter generator for any indefinitely hovering quadcopter with arbitrary properties

Teaching & Work Experience

Reinforcement Learning Graduate Student Instructor Aug 2021 - PRESENT

CSE 498/598 Course Staff, University of Michigan, Ann Arbor

- Designing course homework, exams, and final projects to facilitate student learning and self-driven research projects
- Hosting designated office hours for lecture-style teaching and one-on-one tutoring sessions

Software Engineer Aug 2021 - April 2022

AWS EC2 Nitro, Amazon Web Services

- Designing framework to autonomously maintain health of EC2 cloud computing fleet, used by all AWS customers
- Collaborating and coordinating with team members in planning EC2 health maintenance campaigns to best serve AWS

Machine Learning Teaching Assistant Aug 2020 - Dec 2020

CS189 Course Staff, University of California, Berkeley

- Lead course discussions for over 100 students by constructing mini-lectures and giving one-on-one guidance to students
- Lectured and organized review sessions to give course overviews, test preparation, and outlets to answer students' questions

Software Engineer Intern Jun 2020 - Aug 2020

AWS DynamoDB, Amazon Web Services

- Designed and implemented request router placement algorithm to maximize robustness of 50,000 cloud computing hosts
- Helped construct request router ingestion automation framework still currently used by all of DynamoDB

Projects

Multi-Agent Pursuit and Evasion Mar 2021 - May 2021

Final Project for Introduction to Robotics, University of California, Berkeley

- Designed a swarm intelligence-inspired algorithm to coordinate multiple agents to pursue and capture one evader agent
- Designed techniques for pursuers to predict evader movement and devise coordinated strategies to trap the evader in real-time

Artificial Intelligence Writer Mar 2019 - May 2021

Freelance Published Articles, Medium

- Published Medium articles in two publications (Towards Data Science, Towards AI) on AI foundations and RL algorithms
- Translated state-of-the-art research and mathematically inclined concepts into digestible articles for data scientists and readers

Computer Vision Controlled Mouse Dec 2019 - Jan 2020

Personal Project, University of California, Berkeley

- Used OpenCV, image processing techniques, and PyTorch to train a CNN for hand gesture recognition
- Implemented real-time hand gesture detection and tracking to control mouse cursor events using a designated webcam

AI Gym Reinforcement Learning Challenges Jan 2019 - Aug 2019

Personal Project, University of California, Berkeley

- Implemented algorithms such as DQN, SARSA, and Q Actor-critic to solve reinforcement learning problems using PyTorch
- Self-taught and researched numerous reinforcement learning algorithms such as Soft Actor-Critic, TD3, PPO, and TRPO

Honors and Fellowships

National Science Foundation Graduate Research Fellowship	March 2022
High Distinction in General Scholarship	May 2021
Honors in Computer Science	May 2021
Upsilon Pi Epsilon	Dec 2019
Dean's List	May 2019, Dec 2020