Zhiyuan "Paul" Zhou

PERSONAL INFORMATION

Email	zhouzy@brown.edu
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Google Scholar	Zhiyuan Zhou

EDUCATION

Brown University 2019 – Expected 2023
Sc.B in Applied Mathematics and Computer Science

- GPA: 4.0 / 4.0; on track for CS Honors.
- Selected CS Coursework: Collaborative Robotics, Deep Learning, Machine Learning, Computer Vision, Multiprocessor Synchronization, Computer Systems.
- Selected Math Coursework: Recent Applications of Computational Probability and Statistics, Pattern Theory, Statistics in Quantum Mechanics, Applied PDE & ODE.

PUBLICATIONS

Specifying Behavior Preference with Tiered Reward Functions 2022
Zhiyuan Zhou, Henry Sowerby, Michael L Littman
In submission to AAAI 2023

Characterizing the Action-Generalization Gap in Deep Q-Learning 2022
Zhiyuan Zhou, Cameron Allen, Kavosh Asadi, George Konidaris
Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM)

Designing Rewards for Fast Learning 2022
Henry Sowerby, **Zhiyuan Zhou**, Michael L Littman
Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM)
[Selected for **oral**]

Improving Post-Processing on Video Object Recognition Using Inertial Measurement Unit 2022
Zhiyuan Zhou, Spencer Boyum, Michael Paradiso
Brown Undergraduate Research Journal, Spring 2022 Edition

ACADEMIC EXPERIENCE

Intelligent Robot Lab, Brown University 2020-Present
Undergraduate Research Assistant

- Working with professor George Konidaris and various Ph.D. students under Brown's BigAI initiative; one co-first author conference paper in submission and one first-author paper accepted at RLDM.

- Researched various topics in deep Reinforcement Learning (RL): generalization and life-long learning; hierarchical RL through skill chaining; distributed hierarchical RL; action generalization in Deep RL.

RLAB, Brown University 2021-Present
Undergraduate Research Assistant

- Working with professor Michael Littman; one paper accepted at RLDM with oral and one first author conference paper in preparation.
- Researched various topics in reinforcement learning, and focused on the reward design and behavior specification problem with formal guarantees.

Humans to Robots Lab, Brown University 2020
Undergraduate Research Assistant

- Collaborated with professor Stafanie Tellex in a graduate robotics course.
- Researched instructing robot navigation using a combination of natural language commands and pointing gestures.

Paradiso Lab, Brown University 2020
Undergraduate Research Assistant

- Worked with professor Michael Paradiso funded by the Brown Undergraduate Teaching and Research Award (UTRA); one first-author paper published in school journal.
- Helped build a visual prosthetic device and researched topics in video object recognition.

Department of Applied Math, Brown University 2022 - Present
APMA Peer Advisor

- Advised underclassmen on course selection and career planning and built meaningful advising relationships.

INDUSTRY EXPERIENCE

Zencastr, Inc. July 2021 - Aug 2021
Natural Language Processing Engineer Intern

- Engineered and deployed a web app with websockets and FastAPI that allows users to edit (faulty) automatic audio-to-text transcriptions for uploaded audios, and provides a faster editing experience by intelligently recommending potentially incorrect segments; Implemented a thread-safe MongoDB store with asyncio and motor to store user-made edits in the backend.
- Automatically applied user-made edits to similar occurrences throughout the audio file using Keyword Spotting with language and acoustic models from Kaldi and vosk-api, and sped up the process 2× using multithreaded offline-decoding in Python and Shell
- Sped up automatic speech recognition 5× using WeNet architecture (written in C++) and Speech Activity Detection with Kaldi; model is pushed to production.

Zencastr, Inc. Dec 2020 - Jan 2021
Machine Learning Engineer Intern

- Built a CNN in Keras that classifies audio files into speech, music, laughter, or noise with 93% accuracy; trained using audio data crawled from YouTube using youtube-dl and augmented by adding noise, changing pitch, and stretching time.

- Aligned audio-to-text transcriptions from DeepSpeech and Webspeech API using dynamic time warping and grapheme similarity.
- Built a private Python package of Machine Learning utility scripts hosted on GitHub with Continuous Integration

TEACHING

Head Teaching Assistant Spring 2022
CS1420 Machine Learning, Brown CS

- Managed a team of 20 teaching assistants and organized course logistics for 200 students.
- Built auto-grading pipeline for 12 coding assignments on Gradescope that enabled students to see code correctness shortly after handin.
- Answered questions through weekly TA hours and online discussion platform Edstem.

HONORS AND AWARDS

3^{rd} place in SELEF literary competition, STEM category 2022

Brown Undergraduate Teaching & Research Award 2021

Hack @ Brown Most Contrarian Hack & Wolfram Award 2021

Brown Undergraduate Teaching & Research Award 2019

227th (top 5%) in Putnam Math Competition, top 3 at Brown 2019

2nd Place in Hartshorn-Hypatia Math Contest 2019

Yongren Full Fellowship at PROMYS 2018

Provincial Top 1% in Chinese Physics Olympiad 2018

Regional Top 10 & International Top 100 in Physics Bowl 2018

Top 5% in AMC12 2018

Finalist in High School Mathematical Contest in Modeling 2017

INVITED TALKS

Designing Rewards for Fast Learning
Conference on Reinforcement Learning and Decision Making (RLDM) June 2022

Pareto Optimal Reward Functions
Robotics Lab, Brown CS July 2022