ZHIYUAN "PAUL" ZHOU

AI researcher & ML engineer

(401)-867-0423 paul_zhou@brown.edu zhouzypaul.github.io zhouzypaul
Box #4684, 69 Brown St, Providence, RI 02912 https://www.linkedin.com/in/zhiyuan-paul-zhou/

EDUCATION

Brown University Expected May 2023

Sc.B. in Applied Mathematics and Computer Science **GPA: 4.0/4.0**

Courses: Collaborative Robotics (grad level) · Deep Learning · Machine Learning · Reinforcement Learning (UCL online) Software Engineering · Intro to Computer Systems · Statistical Inference · Honors Linear Algebra & Calculus

Awards: National **top 5%** (227th) in **Putnam** (**top 2** at Brown) · **2nd** place in Hartshorn-Hypatia Math Contest Brown UTRA research scholarship · **top 1%** in Chinese Physics Olympiad · **Finalist** in HiMCM Physics Bowl Regional **top 10** & international **top 100** · **Top 5%** in AMC12 and qualification for AIME sole recipient of 2018 PROMYS Yongren Full Scholarship

AI RESEARCH

Research Assistant Code Code Code Dec 2020 - Present

Intelligent Robot Lab & RLAB, Brown University Providence, RI

- Published one first-author and one second-author at RLDM and was selected for oral presentation; Submitted two first-author RL papers to ICML 2023 that is currently under review. (Please refer to my CV for a full publication list.)
- Engineered the first-ever Python library for distributed training of **Hierarchical RL** algorithms.
- Studied **transfer learning** in RL using the attention mechanism, and successfully transferred knowledge from one task to another.
- Proposed an algorithm for generating reward functions using linear programs that enables RL algorithms to learn faster; Devised a method the express behavior preference for RL agents and designed reward functions to induce preferable behavior and fast learning.

WORK EXPERIENCE

Head Teaching Assistant Jan 2022 - Present

Machine Learning @ Brown University Providence, RI

- Built auto-grading pipeline for 12 coding assignments on Gradescope and enabled students to see code correctness shortly after handin.
- Organized the course logistics and handled communication between the professor, 20 teaching assistants, and 180 students.

Machine Learning Engineer Intern Dec 2020 - Jan 2021 & July 2021 - Aug 2021

Zencastr, Inc. online

- 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 applies 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 2x using **multithreaded offline-decoding** in **Python** and **Shell**.
- Sped up automatic speech recognition 5x using **WeNet** architecture in **C++** together with **Speech Activity Detection** with kaldi; model is pushed to production.

- Engineered 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 confusion.

MACHINE LEARNING PROJECTS

Split-it | Hack@Brown Nelson Entrepreneurship Prize Winner Jan 2023

- A webapp in **React** that splits the bill for a group by parsing items from a picture of the receipt and letting group members choose what to pay for; the backend interfaces with the React app with **Flask**.
- Built a **Python** backend that parses the receipt picture with **Optical Character Recognition** and **ChatGPT** to achieve SOTA performance

Deep Manager | Deep Learning Course Final Project Dec 2020

- A **Deep Reinforcement Learning** agent that manages a portfolio in the stock market and can make profits.
- Trained the agent in **TensorFlow** using advantage REINFORCE algorithm and historical financial data from yahoo finance.

SKILLS

- **Programming Languages:** Python · C · JavaScript · Java · Shell · HTML/CSS · MATLAB · Scala · ReasonML · Assembly x86-64 · C#
- **Frameworks & Tools:** PyTorch · TensorFlow · Keras · React · SQL · Docker · MongoDB