

ZHIYUAN "PAUL" ZHOU

researcher & developer

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EDUCATION

Brown University

Expected May 2023

Sc.B. in Applied Mathematics and Computer Science

GPA: 4.0/4.0

Courses: Collaborative Robotics (grad level) · Reinforcement Learning · Deep Learning · Computational Probability & Stats
Statistical Inference · Intro to Computer Systems · Integrated Intro to CS · 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** · sole recipient of 2018 PROMYS Yongren Full Scholarship
Top 5% in AMC12 and qualification for AIME

CS RESEARCH

Undergraduate Researcher

🔗 Paper

🔗 Code

📅 June 2020 – Oct 2020

Paradiso Lab, Brown University

📍 Providence, RI

- Invented 3 real-time **video object recognition** post-processing models in **Python** for use in a vision prosthetic headset that helps the visually impaired
- Increased recognition confidence by over 50% by using temporal information of videos obtained from **Inertial Measurement Unit**
- Employed **Kalman Filter**, Intersection over Union method, and quaternions in said models, and built an interface for connecting the models with **YOLOv4**

Undergraduate Researcher

🔗 Demo

🔗 Paper

🔗 Code

📅 Jan 2020 - May 2020

Humans to Robots Lab, Brown University

📍 Providence, RI

- Developed a **C#** API in **Unity** that enables robots to navigate more accurately by providing hand gesture command to corroborate Natural Language commands
- Engineered the **Natural Language Processing (NLP)** back-end to find the location on the map described by NL commands by networking the **IBM Watson Speech to Text** API to a **CopyNet**-based neural net in **PyTorch** using **fastText**
- Built the front-end first-person-view visualization in Unity by inputting hand gestures using **Vive** headsets and laid groundwork for implementation of the API in **Virtual Reality (VR)**

WORK EXPERIENCE

Machine Learning Engineer Intern

📅 Dec 2020 - Present

Zencastr, Inc.

📍 online

- 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 confusion
- built a private **Python** package of Machine Learning utility scripts hosted on GitHub with **Continuous Integration**

MACHINE LEARNING PROJECTS

Deep Manager | Course Final Project

📅 Dec 2020

- a **Deep Reinforcement Learning** agent that manages a portfolio in the stock market and can make profits
- built a customized stock environment in **Python** and trained the agent in **TensorFlow** using advantage REINFORCE algorithm and historical financial data from yahoo finance

Recommender | Course Project

📅 April 2020

- a **Java** program that can parse generic data sets that indicate preferences, generate **Decision Trees**, and use the trees to make intelligent predictions on unseen data according to preferences exhibited in the data set

Connect4 Solver | Course Project

📅 Dec 2019

- a general purpose AI that can play any two-player, sequential, finite-action, deterministic zero-sum game with **Minimax** algorithm and **alpha-beta pruning**
- created a connect4 AI player in **ReasonML** that won 1st place in class tournament of 200 people

SKILLS

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