

ZHIYUAN "PAUL" ZHOU

developer & researcher

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EDUCATION

Brown University

Expected May 2023

Sc.B. in Applied Mathematics and Computer Science

GPA: 4.0/4.0

Courses: Software Engineering · Computer Systems · Intro to Object-Oriented Programming · Deep Learning
Intro to Functional Programming · Collaborative Robotics (grad level) · Machine Learning · Statistical Inference

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

WORK EXPERIENCE

Machine Learning Engineer Intern

📅 Dec 2020 - Present

Zencastr, Inc.

📍 online

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

CS PROJECTS

Maps | Software Engineering Course Project

📅 Mar 2021

- backend build with **Java** and **SQL** that queries into an OpenStreetMaps database to find the shortest route using **A* search**
- frontend build with **React** that displays the visualized map on a canvas and allows the user the pan and zoom on the view; allow users to choose navigation start and end point by clicking on the map or entering street names, and displays the shortest route found

Database | Computer Systems Course Project

📅 Dec 2020

- a **C** server to manage a database that stores key-value pairs in a binary search tree; server is **multi-thread** safe by using mutexes and condition variables and can cancel all client connections on command
- multiple clients that can connect to the server concurrently and query, add to, and delete from the database and handle signals

Shell | Computer Systems Course Project

📅 Oct 2020

- a shell in **C** that can execute other programs, run basic unix commands, and process **redirection** requests
- supports running multiple sub-processes concurrently, handling job control and system signals, and switching execution between **background** and **foreground**

Search | Intro to OOP Course Project

📅 May 2020

- a search engine in **Scala**: an indexer that uses **term frequency** and **PageRank** algorithm to index a Wikipedia corpus & a querier that parses free text queries and return most relevant documents

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
- Increased recognition confidence by over 50% by using temporal information of videos obtained from **Inertial Measurement Unit**
- Employed **Kalman Filter**, Intersection over Union method 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 robot control with 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)**

SKILLS

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