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 - Jan 2021 & July 2021 - 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** library of Machine Learning utility scripts and hosted it on GitHub with **Continuous Integration**

CS PROJECTS

Fork | Software Engineering Course Group Final Project. Code April 2021

- Tinder, but for food: created a webapp with **React** and **websockets** that helps a group find a restaurant within their budget. A group of users are each recommended a batch of restaurants, on which they can all concurrently swipe left/right to indicate preference, and eventually be recommended one final restaurant.
- built a **Java** and **SQL** backend that queries a Yelp restaurant database and use a Naive Bayes Classifier to recommend restaurants to users according to their recorded preference

Maps | Software Engineering Course Project Mar 2021

- a webapp that features a map for navigation: backend built with **Java** and **SQL** that queries into an OpenStreetMaps database to find the shortest route between the specified start and end points using **A* search**
- frontend built 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 Demo Description 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 · YOLOv4