Cyrus Singer

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Education

University of Pennsylvania Aug 2022 - May 2025
Pursuing Bachelor of Science in Engineering majoring in Computer Science *Current GPA: 3.55/4.0*

Work Experience

Technical Lead on Bizzybots Platform | *Wharton Behavioral Lab* 2022 - Present

- **Led a team of five** to develop a web platform for creating custom controllable chatbots, used by over 500 students and professors across 5 universities
- Designed the platform using **React.js** for the frontend and **Express** for the backend, with **Firestore** as the database and **Firebase** authentication
- Hosted the platform on **GCP** using **Docker** and **Cloud Run**
- Implemented a comprehensive **Jest** and **Selenium** based test suite, significantly reducing production bugs
- Conducted infurstructure load testing and verified the distributed architecture can handle **10,000 messages per second**
- Published an Excel-style formulas package link and a number parsing package link on **npm**

Reference available upon request

Software Developer Intern | *CFO4ALL at Penn Venture Lab* Summer 2024

- Developed a web application to provide CPG companies with cashflow forecasting and insights
- Setup the AWS infrastructure and created backend on Amazon App Runner using **tRPC**
- Built a frontend using **React** and **TypeScript** to provide a user -friendly interface
- Created a **PostgreSQL** database on **Heroku** and designed a data model using **Prisma**
- Collaborated in a team of three, ensuring robust and scalable application architecture

Teaching Assistant for Internet and Web Systems (graduate level) | *University of Pennsylvania* 2024 - Present

- Through Office Hours and an online forum, I help students debug their code and understand the course material
- Mentor two groups through the final project, building a distributed search engine

Personal Projects

Webapp to play chess with an LLM | *TypeScript, Next.js, LLMs, Minimax,* | source code 2024

- A web application that allows users to play chess against a chess engine powered by LLMs
- Utilizes a compressed, budgeted, form of the **Minimax algorithm**, with LLMs generating moves and evaluating game states, running in parallel for scalable performance
- Included logging and tuning capabilities, allowing for easy monitoring and adjustment of the algorithm's parameters

Brittle Object Simulation | *Python, GPU optimization, Physics Simulation* | source code, 2022

- Created program that simulated the internal stresses of rigid lattices under arbitrary forces and collisions using **Newtonian mechanics**
- Estimated internal bond stresses using **gradient descent** to fit internal stresses to the lattice's Newtonian motion
- Optimized the bond estimation algorithm to run with fewer gradient descent iterations
- Reimplemented the algorithm to run on a GPU, **improving performace over 10x**

RL Experiment | *Java, Python, Tensorflow, Deep Q Learning* | source code 2020

- Developed a 2D physics environment in **Java** to train agents to navigate an obstacle course
- Implemented various ML techniques, predominantly using **Double Deep Q Learning**, to drive the agents
- Achieved success in training agents to execute precise jumps and navigate the environment effectively

Skills

Languages: JavaScript/TypeScript, Java, Kotlin, Python, C/C++/C#
Software Tools: MATLAB, GCP, AWS, Firebase, Docker, Git, GDB, Selenium
Software Frameworks/Libraries: React, Node.js, Express.js, Pytorch, Tensorflow, pandas, NumPy, tRPC, Prisma