Alex Lu

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Education

UC Berkeley — May 2022
Double Major: Mathematics, Computer Science — GPA: 4.0

Projects

NYCIML Scoring System
- Developed a web application for recording scores and compiling data for NYC's local math league, to be used by ~30 schools around NYC.
- Used SQLAlchemy for data management, HTML/CSS, MDL templates, Canvas.js, and Javascript for frontend design.
- Included data processing to compare difficulty between contests and give question writers feedback about question difficulty and quality.

Graphics Engine
- Developed a graphics engine using C, capable of generating ppms and gifs, used imagemagick for image conversion and displaying.
- Includes features like ray tracing, splines, animation, and 3-D figures.
- Wrote a simple language and parser for compatibility with the engine.

Musical Chairs
- Created a modified version of musical chairs game in C.
- Machines on the same network can connect and play locally, implemented networking, semaphores, 3-way handshake, etc.

Courses

- Linear Algebra
- Discrete Math
- Probability Theory
- Data Structures*
- Multivariable Calculus*
- Random Processes*

* - In progress

Technical Skills

- Python
- Java
- C
- Numpy
- Pandas
- Scikit-learn
- Tensorflow/Keras
- HTML/CSS
- SQL/SQLAlchemy
- Flask

Experience

NYC Math Team — **Nov 2015 - Present**
- Team Captain (2017-18), lead team to an 8 place improvement at national competition, organized weekly practices for about 60 team members, and monthly practices for 120 team members.
- Problem writer and organizer for the NYCIML, NYC's premier high school math contest given to 450 students between 30 schools around NYC, and organize annual meeting with problem solving workshops for about 40 coaches, targeted at coaches trying to form school math teams.
- Teaching assistant for Summer ('18) program for about 120 underclassmen and middle schoolers, taught topics in algebra and number theory, and helped with administrative duties.

Machine Learning @ Berkeley — **Feb 2019 - Present**
- As a new member, I spend about 15 hours per week to learn and implement the fundamentals ideas and algorithms of machine learning, including building my own convolutional neural network.

Neuroscience Research Lab — **Jan 2016 - June 2017**
- Conducted research under Wei Zhu to examine effects of Halofuginone on colorectal cancer cells.
- Observed decrease in quantity of cancerous cells over time, as well as inhibited ability to spread to healthy cells when exposed to HF, results won Siemens semifinalist award.