Andrew M. Zhang

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EDUCATION

University of California, Berkeley *Expected Graduation May 2020*

B. A. in Computer Science, GPA: 3.957,

Relevant Coursework: Machine Learning, Computer Security, Algorithms, Concepts of Probability Theory, Concepts of Statistics, Upper Div. Linear Algebra, Machine Structures, Discrete Math and Probability Theory, Data Structures, Designing Information Devices and Systems I/II, Structure and Interpretation of Computer Programs,

Programming Skills: C/C++ (Nvidia CUDA) ◦ Java (Android) ◦ Python (Flask, Numpy, Sklearn, Tensorflow, Pytorch, Pywren) ◦ Javascript (Meteor, Nodejs) ◦ HTML/CSS ◦ MongoDB ◦ SQL ◦ Firebase framework

EXPERIENCE

RISELab, UC Berkeley – Disaggregated Machine Learning (C++): Cirrus Aug *2017 – present*

Undergraduate Researcher. Project Link: github.com/jcarreira/cirrus

- Low-cost, serverless, machine learning, and hyperparameter optimization framework in C++ that runs on AWS Lambdas
- Implemented scalability improvements, including multiple parameter servers (sharding) for Logistic Regression
- Implemented collaborative filtering model using SGD, helped fix mathematical errors with original implementation
- Made Cirrus converge faster than Spark on datasets, including Criteo Ad-Click Logs and Netflix Recommendations

uGSI, UC Berkeley - CS70: Discrete Math and Probability Jan *2017 - present*

Undergraduate Teaching Assistant. ~750 students

- Prepared mini-lectures, discussion questions, and test questions
- Worked with ~20 other uGSI's to answer students' questions, handle course logistics, and help those worried about passing
- Maintained officer hours to help students on homework and theory questions.

Geeni June *2016 - present*

Lead Android Developer

- Worked with a team of 20 devs to create an app for connecting students and tutors at Berkeley
- Lead a team of 5 Android developers to create a Android app: https://youtu.be/9lTFQg4BV9g
- Designed and documented how the backend and frontend would work for Android, iOS, and NodeJS.
- Finalists in Berkeley's Big Ideas Startup Competition.

CalSol, UC Berkeley Solar Car Team *Aug 2016 – present*

Lead of Data Analytics Team

- Developed a data pipeline with Apache NiFi, Google Firebase, PyTorch, and Dash Plotly.
- Gathered and analyzed data about voltage, current, battery stats, and solar panels.

PROJECTS

Blinn: A C++14 Raytracer for Metaballs - github.com/andrewmzhang/blinn

- Created a raymarching metaball render from native C++
- Used Nvidia CUDA to aid in embarrassingly parallel renders, 1000x speedup over multithreaded CPU solution
- Renders video of several oscillating metaballs interconnected by springs
- Video link: https://youtu.be/dfxTMVnEfB0

Various Projects

- **BearMaps**: Java - Used a QuadTree to effectively make a zoom-in able map of UC Berkeley
- **TextEditor**: Java - Wrote a custom data structure to implement a text editor using on JFrames. Supports copy-pasting, click navigation, saving, loading, and undo/redo.
- **Hog Dice Game Solver**: Implemented an optimal solve using an Expectimax Tree for a dice game, implemented in Python
- **Collision Simulation**: C++ - 2D particle elastic collision simulation in real time using priority queues. Each frame updates in linearithmic time. https://vimeo.com/150040521
- **Boid Flocking Simulation**: Java - Created a flocking animation using an efficient k-nearest neighbor search with a k-d tree. Each fram updates in linearithmic time. Simulation of 1000 boids: https://vimeo.com/198900343
- **Yelp Rating Prediction:** Python - Employed MapReduce programming paradigm to parallelize a simple Naïve Bayes classifier with a Bag of Words model in Spark to predict Yelp review ratings
- **Scientific Computing Optimization:** C-Optimized a naïve version of NumPy using performance programming techniques (e.g. SIMD and OpenMP). Achieved >70x speedup compared to the naïve solution