Richard Hu

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Education

University of California, Berkeley — Berkeley, CA
Electrical Engineering and Computer Science B.S. — GPA: 3.95 — *August 2019 – December 2023*

- **Courses**: Algorithms, Operating Systems, Data Structures, Machine Learning, Artificial Intelligence, Computer Architecture, Probability and Stochastic Processes, Convex Optimization, Linear Algebra
- **Honors**: Dean's List, Eta Kappa Nu (HKN) EECS Honor Society, Tau Beta Pi (TBP) Engineering Honor Society

Experience

- **University of California, Berkeley** — Berkeley, CA
  Undergraduate Research Assistant (advised by Professor James Demmel) — *August 2021 – Present*
  - Conduct experiments with another undergraduate student using **randomized SVD**, **single precision SGEQP3.f**, and **QR decomposition** to compress model parameters for federated learning
  - Report results and discuss next steps and ideas in weekly meetings with 3 PhD students and professor
  - **Achieved 80% test accuracy** on federated MNIST dataset with randomized SVD using 30 singular values

  Head Teaching Assistant (TA) - CS 70 Discrete Mathematics and Probability Theory — *June 2020 – Present*
  - Manage **over 50 members of course staff**, teach discussion sections of **40 students**, and coordinate course logistics with 4 other head TAs and 2 professors for a class of **over 850 students**
  - Spearheaded course staff hiring by evaluating **over 300 applicants** and corresponding with EECS department hiring coordinators
  - Rated **4.7 / 5** on average by students and won **Outstanding Graduate Student Instructor Award (2021)**, awarded to **top 10% of TAs university-wide**
- **Amazon** — Bellevue, WA
  Software Development Engineer Intern — *May 2021 – August 2021*
  - Developed internal debugging tool to rapidly store and retrieve transporter itineraries using **Java** and **Typescript**
  - Consulted with **3 engineers** on On-Road Execution team to set up **AWS S3 buckets**, **AWS Glue Tables**, and **AWS Kinesis Firehose** delivery streams using **AWS CDK**
  - Defined APIs to push itineraries through Firehose delivery stream to S3 buckets and query **AWS Athena** to retrieve itineraries by time range and transporter ID, and modified existing backend workflow to utilize new APIs
  - Reduced time required for all itinerary-related debugging by **95%**, from **20 minutes** down to less than **1 minute**

Projects

- **m37 - Algorithmic cryptocurrency trading** — *October 2021 – Present*
  - Forecast cryptocurrency k-line averages with ARIMA and GARCH models using **Jupyter Notebook**, `numpy`, `statsmodels`, and `arch`
  - Attained **0.04% average error** on Bitcoin k-line mean forecasts with **over 80%** of forecasts lying between the actual high and low of the k-line period
- **Lines of Action** — *March 2020 – April 2020*
  - Implemented 2-player Lines of Action board game in Java playable via terminal or GUI using AWT and Swing
  - Researched game tree evaluation and implemented an AI based on **Winands et al. 2001**, winning **second place** in a course-wide tournament of over **400 competitors**
- **Hex Rockets** — *September 2018 – January 2019*
  - **Collaborated with one friend** using **low-level Java game development library** to develop and maintain a cross-platform mobile game teaching hexadecimal arithmetic
  - **Won Congressional App Challenge** and received **over 100** installs across iOS and Android with **primarily 5-star** reviews

Skills

Advanced: Java, Python, C, NumPy, Jupyter Notebook, Git, Machine Learning, Statistics
Familiar: C++, JavaScript, Typescript, SQL, Unix-like Operating Systems, AWS, TensorFlow, PyTorch