David Yang

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Education

University of Berkeley, California — Berkeley, CA

B.S in Electrical Engineering and Computer Science (4.0/4.0) — *08/2023 - 05/2027*

- Coursework: Structure and Interpretation of Computer Programs (A+), Data Structures (A+), Discrete Mathematics and Probability Theory (A+), Principles of Data Science (A), Statistical and Machine Learning (A)
- Planned: Efficient Algorithms and Intractable Problems, Probability and Random Processes, Linear Programming and Network Flows, Designing Information Devices and Systems I
- Graduated with A.S in Computer Science from College of San Mateo in High School

Experience

Research Assistant — 03/2022 - 08/2022

Cardiovascular Data Science Lab, Yale University — *New Haven, CT*

- Developed a full-stack federated-learning demo tool for hospitals in Japan and US. Orchestrated the seamless integration of Yale AWS instances and databases, delivering substantial 2x efficiency of query intialization.
- Spearheaded Yale-OHDSI by incorporating hierarchical administrative access and learning the Athena vocabulary for hosting the OHDSI SQL generation tool.
- Deployed a federated BOW spaCy model for classifying patient features (Age, Gender, Risk) based on hospital texts, achieving 0.99 binary AUC and 0.87 macro-F on 77 categorical age labels. Presented model at lab meeting.

Software Intern — 05/2022 - 08/2022

Beaver Works Summer Institute, MIT Lincoln Laboratory — *Lexington, MA*

- Completed training course from March to May to understand the basics of Python, Git, natural language processing, and machine learning.
- Wrote auto-differentiation package from scratch for use in gradient-learning and backpropagation methods.
- Led 4 team-based AI capstones: Song Fingerprinting, Facial Recognition, Semantic Image Search from GloVe embeddings, BayMac: A Better Self-Care App. Developed computer vision on BayMac with work on YOLOv7.

Projects

Route Optimization for Emergency Vehicles | *Python, Numpy, Pandas, Machine Learning* — Current

- Spearheaded a project focused on optimizing ambulance deployment by analyzing historical emergency call data, response times, and resource utilization patterns.
- Designed and implemented a seasonal, auto-regressive, moving average model to assess different ambulance deployment scenarios, considering factors such as time of day, holidays, and forecasted conditions.

Scheme Interpreter | *Python, Scheme, React, Flask* — 2023

- Nurtured deep understanding of the Read-Eval-Print interpreter loop to build the interpreter for a subset of the Scheme in the Python language. Supports tail-call-optimization, nested frames, and special forms such as $\lambda, \wedge, \vee$.
- Developed a full-stack web application using with Flask serving a REST API with React as the frontend.

Random PacMan | *Java* — 2023

- Led a partner effort to design and implement a 2D tile-based world, improving the world generation process runtime from N^2 to $Nlog_2(N)$ using Kruskal's algorithm. Designed AI agents using alpha-beta pruning search.

Interests and Achievements

Pedagogy

- Created discussion worksheets, exam problems, and review sheet content to enhance student understanding of complex topics and facilitate interactive learning as Head TA for AP Computer Science.
- Led a team of 10 tutors over two seasons and advocated for the academic achievement of over 50 students, coordinating efforts with tutors across the globe for USACO Tutor. Promote students to Platinum and IOI-Silver.

Awards

- National Merit Scholar
- Wrote an official problem for the USACO Silver Division - Year of the Cow - published in February 2021.
- 1000/1000 on USACO Silver and 700/100 on Gold in December 2020. Round 2 at Facebook Hackercup in 2021.