TYLER H. YANG

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Education

University of California, Berkeley   **Graduation**: May 2023

- **Major:** Computer Science   **Minor:** Data Science   **GPA:** 3.8
- **Upcoming Coursework:** Introduction to Artificial Intelligence, Computer Security, Principles and Foundations of Data Science, Introduction to Cloud Computing
- **Major Coursework:** Data Structures and Algorithms, Machine Structures, Artificial Intelligence for Health and HealthCare, Fundamentals of Data Science, Efficient Algorithms and Intractable Problems
- **Technical Coursework:** Designing Information Devices and Systems, Discrete Math and Probability Theory, Introduction to Algorithmic Thinking, Multivariable Calculus

Skills

- **Languages:** C, C++, Java, JavaScript, Python, SQL, Scheme, MATLAB, HTML, CSS, RISC-V
- **Technologies and Libraries:** Jupyter Notebook, React, NetworkX, Selenium, Material UI, Node, NumPy, Matplotlib, Intel AVX Intrinsics, SciKitLearn, Git, OpenMP, TensorFlow, PyUnit

Experience

Water@UW-Madison   **Berkeley, CA**
Software Developer Intern   *August 2021 – December 2021*

- Worked in **Python** utilizing **Jupyter Notebook** to create a graph visualization notebook to represent municipal water transportation across Madison County, Wisconsin.
- Utilized **Pandas**, **Matplotlib**, and **NetworkX** on City of Madison Open Data to generate graph path-finding models representing distance optimized pipeline routing from water treatment plants to surrounding cities.
- Developed unit testing module using **PyUnit** to test reliability and accuracy for graph traversal algorithms

FourSite Inc.   **Boston, MA**
Front-End Developer Intern   *May 2021–Aug 2021*

- Developed product marketing webpages utilizing **JavaScript**, **HTML** and **CSS** through 3+ rounds of clientele meetings
- Transitioned frontend framework development to **Material-UI** and **React** with a focus on creating modular components
- Developed window resizing functionality to actively reformat content with respect to different device dimensions, increasing customer approval by 25%

Projects

Voice-Controlled Car

- Designed and constructed a hands-free vehicle with features such as voice command, terrain traversal compensation, and swerve error correction in **C** and **Python**.
- Applied k-means clustering to offer support for 4 voice commands with 97% accuracy
- Underwent 10+ rounds of iterative testing using **Matplotlib** and **NumPy** libraries to derive least squares approximation and system eigenvalues to minimize lateral error by over 85%
- Performed PCA dimensionality reduction to create low-rank approximation utilizing 20% of original data while preserving more than 90% command response accuracy

NumC

- Recreated a lite-version of the python library NumPy in **C** utilizing **Intel AVX Intrinsics** and **OpenMP** to vectorize and multithread inputs for matrix operations
- Developed and implemented a fast matrix powering algorithm utilizing cache blocking and loop unrolling running in **O(log(n))** time complexity to achieve a speedup 1000 times faster than naïve matrix powering.
- Optimized matrix multiplication to take advantage of cache blocking, multithreading, and vectorized operations to achieve a speedup more than **65 times** faster than naïve matrix multiplication.

Bear Maps

- Engineered a lite version of Google Maps in **Java** encompassing the Berkeley area with support for pathfinding, autocomplete, and zoom functionality
- Developed and implemented an A* path finding algorithm utilizing historical traffic data, providing users with optimized direction querying.
- Created an optimized trie data structure using ASCII array indexing to support autocomplete queries 100 times faster than staff created solution.

Mancala Optimization

- Calculates optimal move in the turn-based strategy game mancala using MiniMax algorithm and Alpha-Beta Pruning
- Conducted 5+ rounds of iterative testing using various marble arrangements yielding an average 70% win rate against both players and other AI scripts.