Michael Pham

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Education

- **River City High School** — West Sacramento, CA
  High School Diploma — *Mar 2019 – Jun 2022*
  - GPA: 4.00
  - Graduated Salutatorian
- **University of California, Berkeley** — Berkeley, CA
  B.A. in Computer Science, Data Science, and Mathematics — *Aug 2022 – Present*
  - GPA: 3.87
  - Member of Upsilon Pi Epsilon Honor Society

Projects

- **Audio Analyzer and Visualizer** | Java, Processing
  - Displays different representations of audio, including waveform and polar graphs, alongside a responsive visualizer.
  - Implemented a Discrete Fourier Transform algorithm, along with smoothing the RDFT.
  - Includes a beat detection feature by observing the audio's level and seeing if there's a marginal difference.
  - Created 3D objects that moved, rotated, and changed size and color based on audio frequency levels.
  - Created moving 3D terrain using Perlin Noise mapped to audio frequencies, moving based on frequency values.
- **Berkeley Admissions Visualization** | Python, Matplotlib, NumPy, Pandas, Plotly, RegEx, Seaborn
  - Compiled data on Berkeley's Californian public school admissions, and created visualizations for it.
  - Filtered, regularized, and merged data from various sources with Pandas and RegEx.
  - Visualized data using scattermaps, choropleth maps, and other charts using Matplotlib, Seaborn, and Plotly.
- **Build Your Own World** | Java
  - An interactive maze exploration survival game featuring enemies.
  - Implemented a pseudo-random world generation system via Prim's Algorithm.
  - Created a smooth lighting system using BFS, alongside pathfinding enemies with A*-Search Algorithm.
  - Features saving functionalities implemented through serialization.
- **Optimizing Convolutions** | C, OpenMP, OpenMPI, SIMD
  - Optimized naïve 2D Convolution algorithm through efficient cache usage, parallel programming, vectorizing operations, and working with pointers.
  - Achieved around a 50x speedup.
- **A Secure File Sharing System** | Golang
  - Designed and implemented a secure file sharing system using cryptographic library functions.
  - Implemented file creation, appending, sharing, and deletion among multiple users. Users could also sign on from multiple devices and edits would be reflected across all accounts.
  - Utilized symmetric encryption, HMACs, and digital signatures to ensure security.
  - Extensively tested implementation, writing over three thousand lines of test code. Utilized fuzzing as well.
- **Spam Classifier** | Python, Matplotlib, NumPy, Pandas, RegEx, scikit-learn, Seaborn
  - Created a spam email filter using a Logistic Regression model. Achieved an accuracy of 99.2% on given test data.
  - Cleaned and visualized data using Pandas, RegEx, Matplotlib, and Seaborn.
  - Fine-tuned hyperparameters by cross-validation with GridSearchCV.

Technical Skills

- **Programming Languages**: C, CSS, Golang, HTML, Java, Javascript, MATLAB, Python, R, RISC-V, Scheme, SQL
- **Frameworks/Libraries**: Matplotlib, Numpy, OpenMP, OpenMPI, Pandas, Plotly, Processing, PyTorch, scikit-learn, Seaborn, TensorFlow
- **Tools**: Docker, gdb, git, Logism, LaTeX, Valgrind
- **Mathematics**: Abstract Algebra, Discrete Mathematics, Linear Algebra, Logic, Numerical Analysis, Real Analysis