Adnan Ashraf

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Education

University of California, Berkeley — Berkeley, CA

Bachelor of Arts in Computer Science — GPA: 3.94 — *Expected Graduation: Spring 2025*

Coursework *Data Structures and Algorithms, Efficient Algorithms and Intractable Problems, Computer Architecture, Discrete Mathematics & Probability, Principles and Techniques of Data Science, Optimization Models in Engineering*

Experience

NASA Space Grant Project Intern — May 2022 – Aug 2022

National Aeronautics and Space Administration — *Kentfield, CA*

- Spearheaded the design and development of a complex data visualization tool for geographical radiation analysis with an emphasis on usability and scalability utilizing javascript, leaflet.js, and Firebase
- Processed, cleaned, and prepared radioactivity data for visualization and presented metrics to leadership
- Visualized geographical radioactivity using a dynamically updated heat map built using leaflet.js
- Leveraged Firebase back-end data storage for efficient data storage, retrieval, and visualization, which resulted in enhanced data management capabilities as well as increased scalability
- Collaborated with cross-functional teams to identify necessities and translate them into high-impact software solutions, improving data precision and operational efficiency

Projects

Predicting Housing Prices | *Python, pandas, numpy, matplotlib, scikit-learn, seaborn, regex*

- Created a Machine Learning model to predict the value of houses in counties within the United States
- Integrated pandas and regex to clean, filter, and extract from the dataset reducing data utilization by 95%
- Utilized Matplotlib and Seaborn for visualizations to extract most desirable features of dataset for a price prediction accuracy of 93% from parsing through tabular data frames consisting of 100,000+ data points
- Applied one-hot encoding technique in order to utilize categorical variables reducing error by 14%
- Extensively modified model parameters using cross validation reducing model error by 36% prior to evaluating set

Efficient Convolution | *C, OpenMP, OpenMPI, Intel Intrinsics (SIMD)*

- Created a program to efficiently convolve sets of large matrices together using C
- Implemented SIMD vector operations to cut the number of operations required resulting in a 417% speedup
- Utilized OpenMP multithreading to parallelize operations to execute simultaneously, reducing the runtime by 43%
- Optimized code to take advantage of CPU cache, lowering memory retrieval time resulting in extra 11% speedup
- Strategically unrolled dense loops to avoid CPU pipeline control hazards, concluding with a 10.6 times speedup

Build Your Own World | Java, Git

- Lead group Capstone Project creating a video game engine that uses a Randomized Algorithm to generate unique interactive 2D worlds in which the user can explore and engage with the game using the GUI
- Engineered random map generation, keyboard input, save and load structures, random encounters, various avatars
- Implemented logic for map bounding, creating/loading save state including reset and replay options

Browser Game | *JavaScript, HTML, CSS, Firebase, p5.js*

- Developed a spin-off of a popular game named "2048" using p5.js
- Published a full stack web application allowing for public hosting along with website integration
- Built a live global leaderboard using Firebase's realtime database leading to 200,000+ games played
- Supported a player base of 1000+, pushing weekly updates and bug fixes
- Engineered anti-cheat algorithm to detect foul play, reducing cheating by 95%

Technical Skills

Languages: Java, Python, C, JavaScript, SQL, Risk-V, Matlab, HTML, CSS
Technologies: Git, Bash, Vim, Jupyter Notebook, IntelliJ, Visual Studio, Firebase, LaTex, Make
Libraries: numpy, pandas, scikit-learn, matplotlib, seaborn, regex, leaflet.js, Intel Intrinsics, OpenMP, OpenMPI