SHAHMUN JAFRI

shahmun.z.jafri@gmail.com • shahmun.com • https://www.linkedin.com/in/shahmunjafri/

Backend-focused Computer Science student at UC San Diego with hands-on experience in system-level development, memory management, and machine learning model building. Proficient in C, C++, Python, and backend technologies such as Node.js, Git, and database handling. Strong foundation in scalable software design, debugging, and optimization. Actively expanding into mobile development, with readiness to contribute to backend-heavy applications and services.

EDUCATION

UNIVERSITY OF CALIFORNIA, SAN DIEGO — San Diego, CA
Bachelor of Science, Computer Science, *Minor in Economics* — June 2026
Relevant Coursework: System Programming and Software Tools, Data Science and Optimization, Machine Learning, Data Science in Practice, Graph Theory and Combinatorics, Advanced Data Structures and Algorithms.

TECHNICAL SKILLS

Languages: C++, C, Python, Java, Javascript, HTML, CSS, Arduino
Developer Tools: Git, Github, Vim, VS Code, Valgrind
Libraries: Node.js, React.js, Numpy, Keras, Matplotlib, Seaborn
Certifications: Stanford Machine Learning Certification

RELEVANT EXPERIENCE

Undergraduate Researcher — **San Jose, CA**
Zaidi Lab, San Jose State University — July 2023 – July 2024
- Engineered a superheated plasma device powered by Arduino to effectively treat avulsion and chronic wounds, achieving a 15% reduction in dependency on medical resources.

Head Math Tutor — **Sunnyvale, CA**
Mathnasium — January 2023 – July 2024
- Guided over 100 students across diverse math disciplines, from foundational counting to advanced multivariable calculus and statistics, earning recognition as Best Tutor for exceptional impact and highest student engagement.

President — **Los Altos, CA**
Foothill College — July 2022 – December 2022
- Spearheaded Foothill College's Hackathon, driving targeted outreach and engaging activities to achieve a successful turnout of over 150 participants.

PROJECTS

Southern California Wildfire Project | shahmun.com/projects/california-wildfire-project/ — March 2025
Technology used: Python, Numpy, Seaborn, Pandas
- Created a data visualization of the materials and type of structures that were susceptible to burning during the Southern California wildfires.
- Processed and cleaned 47 columns of data, removing ~25% non-informative features.
- Identified location as the most significant predictor of building fire risk through a random forest classifier.
- Found that newer buildings (post-2008) with fire-resistant materials survived at significantly higher rates.

Custom Memory Allocator | shahmun.com/projects/custom-heap-allocator/ — February 2025
Technology used: C
- Implemented a custom dynamic memory allocator in C, designing "vmalloc" and "vmfree" functions to manage heap memory using a best-fit allocation policy, block splitting, and coalescing strategies.
- Used bitwise operations to manage memory block metadata, tracking allocation status, block sizes, and adjacent free blocks efficiently.
- Built a coalescing mechanism to merge adjacent free blocks and minimize fragmentation over time.
- Prevented double-free errors and invalid memory accesses through defensive programming and boundary checking

Number Recognition | shahmun.com/projects/number-recognition/ — November 2025
Technology used: Python, Numpy, Sci-kit Learn
- Created a binary classification model by processing a dataset of 1,000 uniquely handwritten 0's and 1's by vectorizing each digit, then trained the algorithm with gradient descent, achieving a 2% error rate.
- Built a custom gradient descent loop from scratch, optimizing weights over 10,000 iterations with a tuned learning rate.
- Visualized loss convergence during training to confirm steady descent toward a local minimum without overshooting.

VOLUNTEER WORK

- Volunteered as a kitchen cook at SABA Center.
- Volunteered at Ellis Elementary School to promote mathematics to children by leading a math lesson in class.