Ayan Gaur

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Education

University of California San Diego Sep 2022 - Mar 2026
B.S. Mathematics and Computer Science

Cornell University May 2024 - Aug 2024
Machine Learning Foundations Certificate

Experience

Junkyard Computing Project Apr 2025 - Jun 2025
Distributed Systems Engineer

- Implemented asynchronous job handling for a Go-based grading service running on repurposed Pixel Fold phones
- Converted job flow to a goroutine-driven, non-blocking API with thread-safe state tracking, ensuring concurrency
- Wrote a self-persisting metrics module that records per-job and aggregate latency in JSON, surviving pod restarts
- Ensured cross-compilation and multi-arch Docker builds, rolling out images cluster-wide with zero downtime
- Hardened Kubernetes manifests for low-resource hardware (ephemeral-storage) to stop pod evictions during grading

TritonMates Roommate Management App Sep 2024 - Dec 2024
Full-stack Web Developer

- Built a full-stack web app on Next.js + Tailwind CSS for the frontend and Firebase for backend functionalities
- Incorporated Firebase Auth for secure Google sign-in, facilitating seamless user and data storage in Firestore
- Designed modular APIs and optimized real-time database interactions, reducing data retrieval latency by 9.8%
- Adopted Agile methodologies for iterative development, conducting sprint reviews and integrating user feedback
- Utilized GitHub for version control, managing feature development, issue tracking and debugging effectively

Projects

Embedded Systems Project with STM32 Microcontroller Jan 2025 - Mar 2025

- Programmed low-level device drivers from scratch for GPIO control, enabling LED signaling for communication
- Developed I2C communication drivers to interface the microcontroller with peripherals like accelerometers
- Built an abstraction layer for the accelerometer, for motion loss detection and sensor data acquisition
- Implemented privacy-enabled BLE functionality to broadcast status, ensuring device only emits signals when lost
- Minimized current draw from 1800 μA - 30 μA through sleep mode and interrupt-based accelerometer handling

Nachos OS Projects Apr 2025 - Jun 2025

- Implemented exec, join, exit sys-calls, managing process creation, synchronization, and address space isolation
- Enabled lazy loading and demand paging by initializing empty page tables and a custom page fault handler
- Designed a virtual memory system with a global clock eviction algorithm and an inverted page table
- Integrated swap file I/O and dirty-bit checks for page eviction and pinning logic to prevent race conditions
- Debugged memory access errors with assertion tracing, TLB fault logs, and virtual-physical mem. monitoring

Agentic Resume Builder May 2025 - Jun 2025

- Developed a full-stack application to generate professional LaTeX resumes using an AI agent
- Built a Node.js backend with an Express server to handle API requests and interact with the Google Gemini API
- Designed and implemented a responsive, modern user interface in React, featuring a custom dropzone for file uploads
- Automated the PDF generation process by executing pdflatex commands from the server

Technical Skills

Languages: Python, Java, C/C++, Dart, Bash, R, ARM, HTML, CSS, JavaScript, TypeScript
Frameworks: Kubernetes, Docker, Flask, Flutter, Next.js, Tailwind CSS, TensorFlow, PyTorch, Keras, React, Node.js, Express
Developer Tools: Git, Nachos OS, kubeadm, ONNX, Firebase, MATLAB, MS Office
Libraries: Pandas, NumPy, Seaborn, Matplotlib, Scikit-Learn, React