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 A - 30 A 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 Generator
- Built a full-stack agentic resume generator.
- Parses resumes, converting them to text.
- Utilizes the Gemini API to convert project descriptions into properly formatted LaTeX.
- Generates downloadable PDF files.
- Created a clean and usable interface using JavaScript and CSS.

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
Developer Tools: Git, Nachos OS, kubeadm, ONNX, Firebase, MATLAB, MS Office
Libraries: Pandas, NumPy, Seaborn, Matplotlib, Scikit-Learn