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 *(C/C++, ARM)* 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 1800A - 30A 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 *(React, Node.js, Express, Tailwind CSS)* 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