AHMED KHAN

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SF Bay Area undergraduate specializing in machine learning and artificial intelligence across healthcare, business, and semiconductors

Education

University of California, Davis — Davis, CA

Bachelor of Science - Computer Engineering, Electrical Engineering (Double Major) *September 2024 - June 2028*

- **Computer Engineering:** Computer Architecture w/ RISC-V, Embedded Systems w/ Embedded C, Digital Systems w/ Verilog
- **Electrical Engineering:** Circuit Design, Analog Circuits w/ OrCAD, Introduction to Device Physics, Digital Electronic Circuits
- **Signals and Systems:** Introduction to Signals and Systems, Signal Analysis and Communications, Digital Signals and Systems
- **Computer Science:** Algorithms Analysis, Abstract Mathematics, Computer Networks w/ TCP/IP, Operating Systems w/ Linux
- **AI / ML:** Applied Probability, Applied Machine Learning, Intro to Artificial Intelligence, Intro to Large Foundation Models

Stanford University — Stanford, CA

Summer Session - Computer Science (On Campus) *June 2025 - August 2025*

- **Relevant Coursework**: Machine Learning (CS 229), Personal Finance (ECON 43), Algorithms (CS 161)
- **Machine Learning:** Optimization and Regularization, Deep Learning, Transformers, Compute Infrastructure, Agentic AI
- **Finance and Econ:** Lifecycle Modeling, Asset Allocation, Individual Taxation, Financial Investments, and Financial Planning

Experience

UC Davis Health — Davis, CA

Junior Research Specialist *July 2026 - Present*

- Conducting medical machine learning research in collaboration with UCD RUbiNet, **produced new research results** on Preeclampsia diagnosis from electrocardiograms building on the sole previous paper in the field of Preeclampsia ECG AI/ML by Butler et al.
- Building biosignal pipelines with PyTorch, scikit-learn, SciPy, pandas, and NumPy for signal preprocessing, data augmentation, cross-validation, mixed-precision training, GradCAM model interpretability, and Optuna architecture and hyperparameter search
- Developing autoresearch pipelines with Claude Code and Zotero MCP for autonomous literature review. Training convolutional, random-forest decision-tree, and transformer models on HIPAA-compliant Databricks on AWS Virtual Environment with EPIC data
- Shadowing researchers on Alzheimer's infarct detection from histopathology whole slide images and architecting of campus firewalled high performance compute cluster for training large multi-agent transformer model that self-evaluates sample analysis techniques in-situ

Laboratory for Embedded and Programmable Systems — Davis, CA

Undergraduate Research Assistant *August 2026 - Present*

- Conducting medical machine learning research on transabdominal fetal pulse oximetry, extracting fetal blood oxygen measurements within the womb from a non-invasive infrared sensor placed on the mother’s abdomen with photoplethysmography
- Engineering infrared emission and sensing hardware to clinical trial standards and testing in active hospital environment on human patients and training signal processing and transformer based machine learning models on collected biosignals

Zee Foods, LLC — Fremont, CA

Project Manager *April 2026 - Present*

- Led four software engineering interns over Summer 2026 developing Polaris, a cold chain logistics and customer order management platform using Next.js, hosted on Supabase and Vercel, featuring live order and vehicle tracking in the greater San Francisco Bay Area
- Owning project architecture and roadmap, scoping and assigning feature work, reviewing all contributions against domain-boundary specifications in communication with company owner and operations staff about administrative and operational requirements
- Implementing defense-in-depth security with fail-closed authorization and RBAC spanning CASL and RLS. Implementing Supabase Realtime for live order status and vehicle location, and pagination and virtualization for low latency presentation of large database
- Designing and implementing UI/UX principles with Tailwind CSS, creating brand and identity guide for website and sales materials
- Performing spec-driven development with Claude Code skills and parallel subagents, and test-driven development with Vitest, Testcontainers, Playwright, and GitHub Actions

Robust and Ubiquitous Networking Lab (UCD RUbiNet) — Davis, CA

Undergraduate Research Assistant *January 2026 - June 2026*

- Performed ECG 1D CNN and random-forest decision-tree architecture research and model training on Preeclampsia ECG waveforms using PyTorch and Optuna hyperparameter optimization framework. Collaborated in a team of three, with weekly meetings and presentations to lab faculty, monthly reports, and presentation of final paper and poster to the UC Davis Senior Design Showcase 2026.

Projects

Caliper: Machine Learning Visualization Framework **ahmedkhan-gh.github.io/caliper**

• Machine learning visualization framework in C++ with PyTorch/LibTorch, ImGUI, Metal, Vulkan, and DuckDB that hosts ML tools for GPU augmented live visualization through zero-copy tensor visualization; aliasing as Metal buffers on Apple Silicon MPS and importing Vulkan external memory on Nvidia CUDA under renderer-agnostic contract for write-once code across operating systems

Astrolabe: Knowledge and Intelligence Orchestration **ahmedkhan-gh.github.io/astrolabe**

• Knowledge orchestration interface that synchronizes Obsidian, Eagle.cool, Zotero with shared categorization, tagging, import shortcuts and intuitive visual interfaces to track large scale knowledge work in learning and research

• ACP and MCP agentic functionality across AI inference providers for conversations with coordinated knowledge resources and creation of knowledge artifacts to augment agent and user understanding and navigation of source material for new insights

Sunset: Hack Davis 2026 Hackathon Project **devpost.com/software/sunset-zkxwe1**

• Programmed for 24 hours nonstop using Claude Code and developed Sunset, HIPAA-compliant AI-augmented hospice care platform featuring RLS for data security between hierarchy of hospital staff, patient and related persons and secure local inference AI chatbot

Hades: Human Alerting Device for Emergency Situations **ahmedkhan-gh.github.io/hades**

• Embedded systems IOT device using custom programmed microcontroller running on-board signal and statistics processing long range infrared sensor and mmWave radar human presence detector to push notification to phone of unattended heat source before smoke or fire

Skills

• **Programming:** JavaScript, TypeScript, Python, Verilog, Systemverilog, VHDL, Embedded C, C++, SQL, Drizzle ORM, PostgresQL, SQLite3, HTML, CSS, BASH, RISC-V, OpenGL, CUDA, Next.js, React.js, Vite, Vercel, Supabase, Backblaze, Tailwind, ShadCN, RadixUI, Redis, CASL, Zod, Sharp, Pino, T3-OSS, Vitest, Playwright, Testcontainers, Jsdom, ESLint, PostCSS, DotEnv, Squawk

• **AI/ML:** PyTorch, Libtorch, JAX, Claude Code (MCP, Skills, Hooks), Claude Agent SDK, Transformers, LLM, CNN, Databricks

• **Technologies:** REST APIs, Git & GitHub, Docker, Docker Compose, LaTeX, CMake, CI/CD Pipelines, Amazon Web Services

• **Software:** Adobe Creative Cloud, Autodesk Maya, Microsoft Office, Cadence OrCAD, WebStorm, PyCharm, CLion, MatLab