

Aakkash Muthukumar

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EDUCATION

University of California, San Diego

Master of Science in Computer Science

La Jolla, CA

Sept. 2026 – June 2028

California State University, East Bay

B.S. Computer Science — *Summa Cum Laude* • *Dean's List* (all terms) • GPA: **3.915** / 4.0 Aug. 2023 – May 2026

Hayward, CA

- **Coursework:** Data Structures & Algorithms, Analysis of Algorithms, Operating Systems, Computer Architecture, Computer Networks, Database Architecture, Artificial Intelligence, Linux Systems Administration

EXPERIENCE

Automation Intern

Bridge UX Design Studios

May 2025 – July 2025

Bangalore, India

- Designed and shipped an **AI-powered lead-finding system** using n8n workflow orchestration and **LLM-based classification**, parsing structured records from inbound messages and reducing manual processing time by **>70%**
- Authored and delivered an internal **AI-in-UX/UI training workshop** to 5 design stakeholders, translating LLM capabilities into reusable workflows for research, ideation, and client-facing operations — turning non-technical colleagues into hands-on AI users

Course Learning Assistant — STEM Lab

California State University, East Bay

Jan. 2026 – Present

Hayward, CA

- Support 25 CS students with **Python** and **C** programming — coaching systematic debugging strategies (**gdb**, reading compiler output, isolating segfaults) and toolchain setup (**GCC**, **Makefile**, **IDEs**) across assignments and labs

PROJECTS

Custom 64-bit Operating System | C, x86 Assembly, QEMU

Fall 2025

- Built a **64-bit operating system** from scratch in **C** with a hand-written **x86 assembly** bootloader, transitioning through **real mode** → **32-bit protected mode** → **64-bit long mode** during boot
- Configured **GDT** and **page tables** for long-mode operation; boots to an interactive **kernel shell**; developed and iteratively debugged the system under **QEMU**

AI-Orchestrated Malware Triage Tool | Python, Anthropic Claude API, yara-python, pefile, React/Vite

Spring 2026

- Architected a **full-stack** tool with a React/Vite frontend and Python backend **orchestrating** multiple analysis components (pefile, python-magic, **yara-python**) and external APIs (VirusTotal, Claude API) into a unified report pipeline
- Engineered **fail-closed defaults** and prompt structures separating observed evidence from inferred behavior — applying engineering judgment to LLM output design

Radiography Image Classification | TensorFlow, Keras, MobileNetV2

2024

- Trained a **convolutional neural network** (MobileNetV2 transfer learning) on **~17,000 chest X-ray images** for multi-class classification, applying **Focal Loss** to address class imbalance
- Built a **Grad-CAM** interpretability layer to visualize model attention regions, supporting analysis and explanation of model behavior

STEM Forge — Best AI Integration Award, MESA U Hacks 2.0 | Python, FastAPI, React, Gemma 3n, Ollama

Fall 2025

- Built a **full-stack** local AI education platform (**FastAPI** + **React**) using **Gemma 3n** via Ollama to generate adaptive quizzes, coding problems, and on-demand custom courses
- Engineered for fully **on-device execution** so learners without reliable internet can run the full system locally — recognized with **Best AI Integration Award**

TECHNICAL SKILLS

Languages: Python, Java, C, C++, JavaScript/TypeScript, x86 Assembly, SQL, Bash, HTML/CSS

ML & Deep Learning: TensorFlow, Keras, scikit-learn, NumPy, Pandas, MobileNetV2, Focal Loss, Grad-CAM (interpretability), Hugging Face

LLMs & AI APIs: Claude (Anthropic API), OpenAI, Gemini, open-weight models (Gemma 3n, Qwen, DeepSeek) via Ollama; Prompt Engineering, RAG, Agent Orchestration, MCP, Model Evaluation

Web & Backend: React, Vite, TypeScript, Tailwind CSS, FastAPI, REST APIs, PostgreSQL, Supabase, Milvus (vector DB)

Cloud, DevOps & Systems: Docker, Kubernetes, GitHub Actions (CI/CD), Linux (Arch, Ubuntu, Debian), systemd, bootloader programming, gdb, strace, QEMU, Git, Agile

Foundations: OOP, Algorithms & Data Structures, Software Engineering process, Linear Algebra, Probability & Statistics, Computer Architecture