Avneesh Muralitharan

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Education

University of California, San Diego — San Diego, CA
M.S in Computer Science, Artificial Intelligence — *March 2026*

- GPA: 3.54/4.0
- Relevant Coursework: Deep Learning, Data Mining and Predictive Analytics, Recommender Systems, Parallel Programming

University of California, Santa Cruz — Santa Cruz, CA
B.S in Computer Science — *June 2024*

- GPA: 3.65/4.0

Work Experience

Syneris — Sunnyvale, CA
Machine Learning Engineer Intern — *June 2025 – September 2025*

- Built Claude 4 Sonnet + Mistral-Embed **RAG** assistant over 150+ FDA documents parsed using **OCR** to answer clinical trial compliance questions for biotech companies
- Decreased search latency 180x (minutes to $\leq$ 1 second) through **quantized embeddings** and **Pinecone** DB
- Deployed Mistral-Embed as a **FastAPI microservice** for scalable embedding generation

SMoL Lab — San Diego, CA
Research Assistant — *March 2025 – Present*

- Wrote multi-threaded scraper streaming 800/s+ events (posts, likes, follows) from Bluesky (Twitter-like social media) into a **SQL Clickhouse Database.**
- Implemented fault-tolerant historical ingestion with **cursor checkpointing** and automatic reconnection for lossless ingestion from Bluesky's **Kafka**-like event stream.

Dell Technologies — San Jose, CA
Machine Learning Engineer Intern — *January 2024 – June 2024*

- Developed an assistant designed to recover from Dell PowerProtect system upgrade failures by using Llama3 and RAG over 10,000 server manuals stored in **ChromaDB**.
- 72x faster recovery from upgrade failures w/ **markdown chunking** to ensure complete workflow retrievals

Alveo Technologies — Alameda, CA
Software Engineering Intern — *February 2021 – August 2021*

- Eliminated $4,000 in licensing fees via a **React/Electron/Flask/Plotly** app for remote assay execution and visualization, replacing ThermoFisher software
- Validated 15,000+ COVID-19 test kits on the manufacturing floor through a React/Electron/Flask app that called **embedded C** scripts on physical test harnesses

Projects

AlphaZero Mancala Bot — March 2025

- Wrote a 60% winrate (against skilled human players) deep learning + MCTS Mancala bot trained using **reinforcement learning** and **Proximal Policy Optimization**.

Contrastive Learning and Fine-Tuning Techniques for BERT — March 2025

- Boosted accuracy from 2.7% to 92.0% by fine-tuning **BERT** on MASSIVE dataset (Multilingual Amazon Scenario Set for Intent and Slot Labeling) using **Layer-wise Learning Rate Decay**.
- Reduced parameters by 99.5% keeping 84.2% accuracy using **LoRa**.

Parallel 2D Wave Simulation with MPI — December 2024

- Implemented a 66 GFlops/sec **MPI**-based simulation of 2D wave equations than ran on UCSD's Expanse Supercomputer by optimizing process geometry and using non-blocking communication.

High-Performance GPU Matrix Multiplication — October 2024 – November 2024

- Implemented a 1,690+ GFLOPS **CUDA**-based matrix-mult kernel for NVIDIA's Turing GPU architecture.
- Obtained 94x speedup over CPU implementation by using warp tiling + NVIDIA's **NSight Compute** and **NVPROF** profiling tools to identify memory bottlenecks.

High-Performance Matrix Multiplication Optimization October 2024

- Implemented a 18+ GFLOPS matrix-mult library targeting **ARM** using **SVE vector instructions**.

SlugEvents - Campus Event Aggregator Spring 2023

- Plotted 500+ campus events from 20+ instagram accounts on a **Firebase/React/Google Maps API** app.
- Attained 92% accuracy in parsing time, location from real-time scraped posts using **OpenAI API**.

Skills

C++, Python, Java, Javascript, HTML/CSS, RISC-V, MERN (MongoDB, Express.js, React.js, Node.js), Firebase, AWS, GCP, Docker, CUDA optimization, Pytorch