

# Aarush Agarwal

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## EDUCATION

### Carnegie Mellon University

*Expected Graduation, May 2027*

*Bachelor of Science in AI & CS, School of Computer Science*

- QPA: 3.65, CMU School of Computer Science Dean's List

## EXPERIENCES

### Shopify | Machine Learning Engineer Intern

*May 2025 - Aug 2025*

- Built a buyer-fraud detection system with VertexAI, optimized BigQuery/Dataflow pipelines to increase predictive accuracy, and applied targeted feature selection to reduce training iteration time by 70%.
- **Authored a patent** for a novel AI framework where distributed, specialized agents use Neo4j graph traversal to collaboratively decompose and execute tasks, enhancing output quality.

### Carnegie Mellon Physics Lab | CUDA Research Assistant

*Aug 2024 - Oct 2025*

- Co-authored paper focused on a binning-based parallelized K-Nearest Neighbors algorithm, achieving up to a 200x speedup over FAISS (Facebook AI Similarity), Annoy (Spotify), and SCANN (Google) in low-dimensional spaces.
- Transitioned Python autograd and gradient functions to C++ and CUDA extension implementations and integrated with PyTorch JIT serialization, achieving a 10% decrease in KNN runtime.

## PROJECTS

### Haven | Backend

*Oct 2025*

- **Awarded 1st Place in YC & Fetch.AI Tracks and Best Startup Award at CalHacks 12.0** for an intelligent patient care and hospital management system that coordinates agents for patient monitoring and clinical decision support.
- Architected a distributed system where Fetch.ai and Claude agents coordinate for clinical intelligence; developed a Facial Photoplethysmography (FPPG) pipeline (OpenCV, FastICA) for non-invasive heart rate monitoring and a real-time voice intake agent (LiveKit, Groq) to generate patient summaries.

### Yumi | Backend & ML

*Oct 2025*

- **Awarded 3rd Place (3/150+ teams) at HackHarvard 2025** for an agentic social network that learns food profiles to eliminate dining friction, whether eating alone or coordinating with friends.
- Built a FastAPI backend with taste profile extraction and intelligence learning from user interactions, natural language reviews, sentiment analysis, multi-user preference merging, spatial restaurant search using PostGIS, and Twilio voice integration for automated reservations.

### Medicly | ML Lead

*Sep 2025*

- **Awarded Grand Prize (1/200+ teams) at HackCMU 2025** for a platform that slashes physical therapy evaluation time from 14 days to 10 minutes. Sponsors include Anthropic, Citadel, Stripe, Jane Street, & HRT.
- Engineered a multimodal pipeline with pose estimation, structured kinematics, joint-angle prediction, 3D mesh rendering, and LLM-powered recovery reports.

### Nova | Personal Exploration

*Jan 2025 - Aug 2025*

- Architected a multi-modal agentic AI voice assistant, integrating Whisper ASR, LangChain orchestration, dual TTS engines, wake-word detection, and intent classification to enable real-time system automation and conversational voice interaction.

## SKILLS

**Languages** C++, Python, SQL, C, Java, JavaScript, Swift, Lua | **Familiar:** Ruby, R, Bash, SML

**Software** Tensorflow, PyTorch, CUDA, Vue.js, React, Firebase/Firestore, Git, DBT, GCP, Neo4j, PostgreSQL, Supabase, OpenCV, Pandas, AWS, FastICA, Groq, LiveKit, Fetch.ai, fPPG

**AI Experience** Reinforcement Learning, Machine Learning, GPU Acceleration, Computer Vision, Multi-Agent Systems, GNNs

## AWARDS

USACO Gold