Atharva Rai

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Education

University of Michigan, College of Engineering Ann Arbor, MI

B.S.E. in Computer Science, Minor in Mathematics *Apr 2027*

Relevant Coursework: Data Structures & Algorithms, Advanced Operating Systems, Computer Architecture, Networks, Distributed Systems, Software Engineering, Object Oriented Programming, Theory of Computer Science, Introduction to Machine Learning, Computer Science Pragmatics, Discrete Mathematics, Applied Linear Algebra

Skills

Languages: C++, C, Python, Java, JavaScript, SQL, HTML, CSS

Frameworks/Tools: AWS, Docker, LangChain, Flask, Express, React, Node, TensorFlow, Pandas, PostgreSQL, Git

Work Experience

Blue Cross Blue Shield of Michigan Detroit, MI

Software Engineer Intern - GenAI *May 2025 - Aug 2025*

- Designed a scalable Python-based RAG AI system using Streamlit, Flask, Milvus, and Databricks-hosted LLMs, which enabled employees to query 10,000+ policy documents and reduced their lookup time by 70%.
- Engineered a multi-stage retrieval pipeline that split 10,000+ policy documents into chunks, generated semantic embeddings for retrieval, ran vector search through Milvus, and applied a hybrid reranking model to refine results; this system transformed raw data into structured, queryable knowledge and improved answer accuracy by 80%.
- Built and deployed a hybrid backend architecture where Flask exposed REST APIs, Jupyter executed retrieval logic, and Databricks GPU clusters generated final LLM responses, overcoming vector DB constraints and enabling a production-ready proof of concept with clear pathways for future scaling and enterprise adoption.

Information Technology Intern *May 2024 - Aug 2024*

- Managed and delivered 50+ Salesforce user stories, collaborating with product owners and IT teams to resolve internal workflow issues, improve request routing, and reduce support backlog across multiple departments.
- Automated recurring analytics reports in Excel using VLOOKUP/INDEX-MATCH pipelines and macros, improving reporting accuracy, standardizing workflows, and reducing weekly manual work by 55% for team leads.
- Constructed dashboards to track ticket volume, SLA compliance, and cross-team dependency metrics, giving managers real-time visibility into operational bottlenecks and accelerating data-driven decision-making cycles.

Exercise Is Medicine Ann Arbor, MI

Software Engineer - Full Stack *Aug 2025 - Present*

- Devised and deployed a scalable, modern full-stack website for the Exercise Is Medicine club using React, Node.js/Express, and PostgreSQL, easing member onboarding, event scheduling, and internal communications.
- Developed secure authentication flows, real-time event updates, and role-based admin dashboards, allowing club officers to manage membership, attendance, and announcements through a streamlined, centralized platform.
- Implemented CI/CD workflows with GitHub Actions and modularized the codebase using reusable components, improving maintainability and enabling future student developers to contribute new features without overhead.

Handshake Ann Arbor, MI

AI Research Fellowship *Oct 2025 - Present*

- Collaborating to train multimodal AI systems by performing text, image, and audio evaluation tasks. Refining model accuracy, reasoning, and fairness through iterative prompt design, entity tagging, and output ranking.
- Designing detailed annotation schemas for entity tagging, visual understanding, and retrieval relevance, providing high-quality datasets that strengthen model robustness in image search, captioning, and retrieval tasks.

Project Experience

Thread Management System

- Built a C++ thread library with OS-level scheduling, context switching, and synchronization (threads, mutexes, CVs), supporting 16 CPUs with interrupts, RAII management, and a 30+ program test suite with 100% coverage.

Multithreaded Ray Tracer

- Produced a multithreaded ray tracer in C++ using low-level libraries such as BVH, SIMD, and PBR for realistic lighting/reflections, accelerating computation and rendering up to 5M rays/frame with 2.5× faster performance.

Interests: Basketball, Beagles, Food, One Piece, Traveling, Video Games