

## Aaron Xiong

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### EDUCATION

#### University of Michigan

College of Engineering, Bachelor of Science in Engineering in Computer Science

Cumulative GPA: 3.972/4 (Dean's Honors List)

Courses: Data Structures and Algorithms, Foundations of Computer Science, Introduction to Computer Organization.

Ann Arbor, MI, USA

Dec. 2026 (Expected)

### SKILLS

- **Programming Languages:** C/C++, Python, Swift, HTML/CSS, JavaScript, MATLAB, Verilog, Arduino, SQL
- **Libraries & Frameworks:** ReactJS, Flask, Tailwind CSS, Bootstrap, PyTorch, NumPy, PySerial, Matplotlib, GTK, libcurl
- **Tools:** Linux Ubuntu, Git, Docker, Oracle, VMWare

### WORK EXPERIENCE

#### NLP Research Assistant at LAUNCH Lab

Mar. 2025 – Present

- Developed a comprehensive Open-source LLM benchmark on Olympiad-Level Code Generation with **430+** Informatics Olympiad problems from **60+** competitions between 2023 and 2025, featuring hidden test suites and human contestant rankings.
- Extracted, restructured, and processed task files for each competition and built a contestant database by locating profiles with Serper and parsing Codeforces rating histories, using Google Gemini AI for profile matching based on name, country and text.
- Evaluated performances of **20+** LLMs against human contestants and systematically computed Elo ratings for each LLM model to benchmark code generation capabilities based on test suite results.

#### Full-stack Developer for U-M School of Nursing

Jan. 2025 – Present

- Designed a HIPAA-compliant, mobile-friendly, Full-stack web platform with a team of seven that aims to provide Nurse Health Coaching, Educational Content, and Personalized Community Resources for pregnant people and infant caregivers.
- Integrated Zoom and Qualtrics for nurse coaching and patient assessments, Google Maps for geospatial analysis, Oracle Database for patient data storage, and U-M's text-based generative AI tool Maizey for summarization functionalities.
- Engineered and optimized prompts for Maizey to accurately summarize meeting notes from nurse-patient Zoom sessions, generate personalized care plans for clients, and extract key needs from health surveys while mitigating hallucinations to ensure safety.

### PROJECT EXPERIENCE

#### Computer Architecture Simulator for LC-2K (C, Assembly)

May. 2025 – Jun. 2025

- Created a software toolchain in C for the LC-2K ISA, including an assembler that converts assembly files into machine codes with relocation tables and a linker that combines them into a single executable by resolving symbols and handling data relocations.
- Developed a cycle-accurate simulator for a 5-stage pipelined processor, implementing hardware-based data forwarding to minimize stalling due to data hazards and a branch prediction scheme with instruction squashing to mitigate control hazards.
- Integrated a configurable cache into the simulation to emulate realistic memory hierarchy behaviors, featuring write-back, allocate-on-write, and Least-Recently Used replacement policies.

#### Relational Query Engine (C++)

Mar. 2025

- Implemented a lightweight relational database engine in C++ that supports SQL operations for structured data management.
- Integrated the Field class to store and process heterogeneous data types, enabling flexible storage, lookups, and comparisons.
- Enhanced query performances by **25-48%** by integrating hash-based and index-based indexing, optimized data structures for memory efficiency, and refined the system for deployment in realistic resource-constrained environments.

#### Fake News Classifier (C++, Machine Learning)

Sep. 2024 – Dec. 2024

- Designed an ML algorithm in C++ to identify misinformation in news articles using a training dataset of **12,000+** articles.
- Implemented a Naive Bayes Classifier to predict article authenticity based on linguistic patterns and created a preprocessing pipeline with text normalization, N-gram modeling, and Word Stemming, improving model accuracy **from 62% to 83.8%**.
- Delivered experimental results to stakeholders through a technical presentation, explaining methodology and evaluating trade-offs.

#### Evie (C++, GIS, Algorithms)

Jan. 2024 – Apr. 2024

- Developed a Geographic Information System in C++ for electric vehicle users across multiple regions in a team of three.
- Extracted real-world map data from StreetsDatabase and OpenStreetMapDatabase, rendered visuals using EZGL and GTK, integrated live weather data with Libcurl, designed a user-friendly interface using Glade, and managed team data with Git.
- Implemented A\* Search for efficient navigation functionalities in the application and a TSP algorithm to optimize delivery routes, reducing the average path length by about **20%** relative to the initial implementation and ranking **top 15 out of 91** submissions.
- Led collaborative coding efforts by strategically dividing and distributing tasks and tracking team progress with Agile Roadmaps.