Ayush Sharma

+1 608-896-0281 | sharma272@wisc.edu | linkedin | GitHub | Madison, WI

Education

University of Wisconsin - Madison Madison, WI

B.S. in Computer Science and Computer Engineering, GPA: 3.82/4.00 *May 2027*

Dean's List (4/4 semesters)

Coursework: Neural Networks, Digital System Design, Computer Vision, Signal Processing

Experience

Software Development Engineer Intern Jun. 2025 – Sep. 2025

Amazon *Bellevue, WA*

- Designed high-performance ETL pipeline using SQL to process millions of auction and bid records.
- Implemented AuroraDB triggers to deliver push notifications to $\sim$ 10,000 mobile users with 5 sec latency.
- Extended AWS CDK modules in TypeScript to enable scheduled serverless tasks.
- Created AWS Lambda function to access external services to send notifications and increase user activity.

Undergraduate Research Intern - JuliaPhylo Project Feb. 2025 – Present

UW–Madison Dept. of Statistics *Madison, WI*

- Developed Julia algorithms for phylogenetic graph dissimilarity and tree construction using Hochbaum's Algorithm.
- Optimized linear algebra and graph operations to scale analysis on datasets with 100K+ nodes.
- Built automated validation tests and visualization tools (HTML, CSS, JavaScript) to improve reliability and usability of JuliaPhylo packages.
- Co-authoring a research paper on applying Hochbaum's Algorithm to scalable phylogenetic network analysis.

Projects

Tricking AI Detectors | *PyTorch, LoRA, TinyLlama, SKLearn* Jan. 2025 – May 2025

- Built a binary classifier using a neural network, achieving 91.3% accuracy in distinguishing human vs. AI text.
- Implemented and designed an iterative generate–score–select loop to optimize LLM outputs.
- Fine-tuned TinyLlama-1.1B using LoRA for parameter-efficient training and increased "Humanness" of text by 10%.
- Benchmarked outputs against commercial AI detection systems using ROC curves, F1 scores, and confusion matrices.

Knight's Tour Solver on FPGA | *SystemVerilog, Synopsys, Linux, QuestaSim* Sep. 2024 – Dec. 2024

- Worked in a team of 4 to build an FPGA-based robot using 5 ms clock cycle to solve the Knight's Tour problem.
- Integrated PID controller and UART/SPI protocols to enable control using bluetooth signals.
- Verified design by building a testing package following Universal Verification Methodology.
- Synthesized and optimized the circuit using Synopsys tools, reducing area by 25% and power consumption by 12% with gated clock integration.

Indie Music Discovery for TikTok | *Scikit-Learn, Pandas, Spotify API* May 2024 – Jul. 2024

- Led a team of 5 to build a recommendation system analyzing 600K+ Spotify artist profiles to recommend songs by smaller artists that fit emerging trends.
- Applied TF-IDF vectorization and ML models to generate personalized recommendations with improved accuracy.
- Integrated ML Algorithm into a mock UI of the TikTok mobile application built using flutter.

Robotic Rock-Paper-Scissors Arm | *C++, Signal Processing, Sensors* May 2022 – Aug. 2022

- Developed Arduino-based robotic arm with real-time actuation using springs and servos.
- Designed a glove with flex-sensor gesture recognition and integrated it with the robotic arm

Technical Skills

Languages: C/C++, Python, Java, JavaScript, SQL (Postgres, MySQL, SOQL), Julia, SystemVerilog, MATLAB, Assembly

Tools: Git, Linux, AWS, Node.js, Flask, React, Arduino, QuestaSim, Synopsys

Frameworks & Libraries: PyTorch, TensorFlow, NumPy, SciPy, Pandas, Matplotlib, Scikit-Learn, BeautifulSoup4, Selenium, LoRA