Aditya Goyal

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Education

University of Wisconsin-Madison Madison, Wi

Bachelor of Science in Computer Science and Data Science *Sep. 2023 – May 2027*

GPA: *3.98/4.0*

Relevant Coursework: Object-Oriented Programming, Data Structures I, II, III, ML Research, AI, Big Data Systems, Accelerated Honors in Algorithms, Matrix Methods in ML, Data Science Modelling, Intro to Computer Systems

Technical Skills

Languages: Java, Python, R, SQL (MySQL, PostgreSQL)
Technologies: scikit-learn, PyTorch, Langgraph, pandas, Flask, FastApi, Redis, NumPy, Matplotlib, gRPC, Pyarrow, Apache Hadoop, Spark, Kafka, Streamlit
Developer Tools: Git, Github, Docker, Docker Compose, Postman, Google Cloud

Experience

Undergraduate ML Researcher | UW Madison Computer Sciences *June 2025 – Present*

- Refactored an open-source codebase to run on constrained GPUs by restructuring memory management and pipeline logic. Designed and integrated new algorithms, with an automated benchmarking harness demonstrating clear performance gains over baselines.

Machine Learning Intern | Freecharge *May 2025 – August 2025*

- **Improved spend analysis accuracy by 40%** by engineering AI agents with LangGraph and AWS Bedrock endpoints to orchestrate tools, generate SQL with RAG context, and deliver charts alongside explanations.
- **Boosted semantic match accuracy by 30%** by building a search engine using AWS Kendra over 12,000+ pages and a preprocessing pipeline isolating high-signal fields from noisy webscraped text.
- Enabled real-time branch analytics with YOLO-based video POCs for entrant counting and opening time detection

Software Engineering Intern | UW Madison Department of Physics *Nov 2024 – Feb 2025*

- Implemented Python scripts to train MLPs on mathematical functions and visualize activation flow across layers.
- **Automated large-scale experimentation** by batch processing MLP training runs on randomly generated functions.
- **Improved runtime by 25%** and reduced intermediate memory with vectorizated operations and broadcasting
- Built customizable MLP architectures by parameterizing layers and units, enabling user-specified network designs

Machine Learning Teaching Assistant | UW Madison Computer Sciences *Sept 2024 – Present*

- Supporting 100+ students every week in CS540 (Intro to AI) and CS 300 (Programming II, Java) on debugging projects aand course content, **earning 30+ positive reviews** and leading recruitment of future peer mentors.

Computer Vision Developer | Wisconsin Autonomous *Jan 2024 – May 2024*

- **Secured 2nd place in Construction Challenge** and **3rd place in Mobility Innovation Series** at SAE's AutoDrive Challenge 2024 by developing a stop-line detection algorithm using Canny Edge and Hough Transform.

Projects

ShortNExact | *Python, FastApi, Docker, OpenAI SDK, Redis, PgBouncer, HAProxy, Locust* July 2025

- Built a production-grade agentic AI app that rewrites text to exact word counts while preserving meaning
- Containerized services with Docker Compose, improving reliability through health checks and restart policies
- **Sustained 30+ concurrent users at sub-100 ms median latency** by using async FastAPI components and libraries, and validated scalability by load-testing real traffic patterns using Locust.
- **Reduced latency by 30% and enabled zero-downtime failover** by deploying PgBouncer and HAProxy, with secure API access enforced via Redis and API key validation.

Myshrooms (top 10 cheesehacks 2024) | *Python, React, Flask, scikit-learn, OpenCV* Nov 2024

- Built a poisonous mushroom classification mobile app using React Native and Flask, and hosted it on Expo
- Implemented gill color detection with OpenCV (ROI masking, K-Means clustering) and Nyckel AI, **achieving 94% accuracy** from overhead images and developed a gill size classifier using a fine-tuned MobileNet model and OpenCV edge detection on side-view images, **achieving 80% accuracy**.
- Trained an XGBoost classifier, combining extracted features to achieve F1 scores of 73.7% (poisonous) and 76.2% (edible)

ProblemScope | *Python, Spark, Docker, Docker Compose, Matplotlib* March 2025

- Developed and validated a Decision Tree model in Spark MLlib to predict Codeforces problem difficulty
- Built a distributed Spark–Hive pipeline to process 100K+ Codeforces problems, enabling scalable SQL analytics
- Improved query performance with bucketing, partitioning, and caching, cutting runtimes for large distributed joins

Certifications

• Intro to Cloud Computing (IBM) •Deep Learning Specialization (DeepLearning.Ai) •ML Specialization (DeepLearning.Ai) •Mathematics for ML (DeepLearning.Ai)