Aditya Ramesh

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Education

University of Illinois at Urbana-Champaign **May 2026**
Bachelor of Science in Statistics and Computer Science *Urbana-Champaign, IL*

Relevant Courses: Distributed Systems, Data Management in the Cloud, Compilers, Data Structures, Algorithms, Computer Systems, Database Systems, Applied ML, Statistical Modeling

Technical Skills

Languages: Python, C/C++, SQL, Java, R, Bash
Libraries & Frameworks: PyTorch, HuggingFace, LangChain, NumPy, Pandas, Scikit-learn, Keras, Flask, Django
Tools & Platforms: GCP, AWS, Docker, Redis, Git

Professional Experience

Synchrony Financial **Jan 2026 – May 2026**
Software Engineering Intern

- Implementing data migration for 13 years of historical lineage data (TB+ scale) from on-prem **Hadoop** to **AWS EMR**.
- Developing **Python** automation for **Apache Atlas** to **AWS Glue ETL** with OpenMetadata, reducing manual logging.
- Added validation and failure handling for malformed records and jobs to ensure idempotent runs and consistency.

Motorola Solutions **Feb 2025 – Dec 2025**
Software Engineering Intern

- Engineered real-time, low-bitrate (4.4 kbps) AI Vocoders providing field-deployable wideband audio to first responders.
- Reduced internal testing runtime by 90% by parallelizing PESQ/POLQA score calculations via automated **Bash** scripts.
- Benchmarked STT services (**Azure, AWS, GCP**) using WER/Intent metrics, informing translation architecture decisions.
- Deployed **PyTorch Mobile** models onto embedded Android systems, enabling field-ready inference for APX NEXT radios.

FOCAL Lab at UIUC **Aug 2024 – Dec 2024**
AI Undergraduate Researcher

- Extended UIUC's QuaCer-B framework to detect intersectional biases using **LlamaGuard** for **LLM-as-a-judge** evaluation.
- Built an automated evaluation methodology in **Python** to stress-test multi-source LLMs against 1600 unique vectors.
- Proved feasibility of scalable, multi-attribute LLM bias detection, winning Best Presentation at UIUC URSA Symposium.

ATLAS at UIUC **May 2024 – Dec 2024**
Machine Learning Intern

- Implemented a **computer-vision** enabled trash/recycling classifier for UIUC, enhancing waste-sorting efficiency by 43%.
- Preprocessed over 17,000 images with **pandas/NumPy** for YOLOv9 **CNN** model, allowing for 87% classification success.

Projects

ML-Based Packet Anomaly Detector

- Developed a **C++** packet sniffer with **libtins** capable of 0.05 millisecond packet capture, parsing, and serialization.
- Transmitted packets to **Python** via **Redis** circular buffers, bolstered by the **GeoLite2 Web API** for location tracking.
- Processed inputs with **pandas** and trained a **scikit-learn** based **Isolation Forest** model, outputting anomalous activity.

Confluence-Data Contextualized LLM Enhancement Tool

- Engineered a custom-LLM tool with **RAG** on **Confluence API** data through **LangChain**, enhancing query responses.
- Embedded textual inputs as vectors using **HuggingFace** to conduct semantic/lexical search with **Pinecone** Vector DB.
- Deployed **Ollama** API to host Llama 3.1 8B LLM locally, using **Redis** as a cache for chat-history-persistence.

Eco-Journey Travel Planner

- Constructed a **MySQL** backend analyzing 45 million+ weather records to generate personalized travel rankings.
- Accelerated geospatial queries via composite indexing and coordinate-rounding for efficient large-scale data retrieval.
- Enforced 5-trip user quotas via **SQL Triggers**, automating **FIFO** rotation to manage active sessions and data integrity.

Spotify 3D Visualizer

- Architected **Flask** routing and **SQLite** integrations for a 3D music-visualization platform using Spotify user data.
- Implemented an **OAuth2** authentication flow for seamless login and data-caching, enabling minimal backend latency.
- Validated **RESTful APIs** using **Postman** to compute plots for **Three.js** integration, providing interactive music analytics.