

# AARYANGUSAIN

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## EDUCATION

### University of Illinois at Urbana-Champaign

Bachelor of Science in Computer Science, *James Scholar, Dean's List*

Expected May 2027

**GPA:3.84/4.00**

### Related Coursework:

Database Systems, Discrete Math, Linear Algebra w Computational Appl, Data Structures,  
Algorithms and Models of Computation, Artificial Intelligence, Computer Architecture

## TECHNICAL SKILLS

**Languages/Frameworks:** Java, C++, Python, SQL, Rust, Javascript, NodeJS, ReactJS, Docker, Pandas, scikit, Keysight  
PathWave, MATLAB, Pytorch, HTML, CSS, HTML5, Flask

## WORK EXPERIENCE

### UL Solutions

*Engineer Intern*

**Fremont, CA**

*May 2025- Aug 2025*

- Leveraged Python frameworks (e.g., **PySerial, PyVISA**) to control Chimp-driven test fixtures and DUTs over SCPI/LXI, seamlessly orchestrating communication with Keysight UXA analyzers and calibration equipment, reducing configuration time by **~50%** and improving consistency for a new product launch for a **Fortune 50 client**, while enabling real-time monitoring of key metrics (e.g. OBW, SEM, CSE) to surface emissions anomalies early.
- Accelerated high-volume testing validation by **200%** by harnessing software to automate spectrum capture and report generation pipelines, transforming a error-prone workflow into a streamlined, repeatable process.

### Lumiere Education, Research Assistant

- Utilized over **170+ years** of NOAA historical data alongside **100+ web-scraped** records of major hurricanes from Wikipedia and other diverse online repositories to conduct a comprehensive statistical analysis. Identified a **strong (85%) correlation** between tropical cyclone intensity, frequency, wind speed, and average temperature through various machine learning techniques, underscoring temperature as a primary driver of hurricane development and escalation.

## PROJECT HIGHLIGHTS

### Beehive Queen-Presence Classifier (Audio DSP, scikit-learn, LightGBM)

January 2025 – Present

- Engineered a full labeling pipeline that time-syncs **20 k+ Urban-Beehive recordings** with hive-inspection logs producing a richly annotated dataset in **< 5 min/run**.
- Designed a 308-dim acoustic feature stack (128-band Mel stats + MFCC &  $\Delta$ -MFCC summaries) and automated caching to cut extraction time by **70 %**; trained and benchmarked KNN, RF, XGBoost, MLP and LightGBM models.
- Delivered queen-presence detection at **98.4 % accuracy (LightGBM, imbalanced-aware)** while boosting minority-class recall **2x** with MFCC augmentation and targeted SMOTE, providing the Robinson Lab at UIUC a deploy-ready tool for live hive health monitoring.

### VTuber Conversational System (Python, Llama-3, Docker, WebSockets)

January 2025 – Present

- Built a WebRTC-driven multimodal chat stack that brings anime characters to life using a LoRA-tuned Llama-3 8B model and a Live2D Kurisu-style React frontend
- Processed **500 K Reddit/CharacterAI lines**; trained with DeepSpeed ZeRO-2 on H100, cutting epoch time by **300%**.
- Containerized LLM, ASR and TTS micro-services with Docker Compose and WebSocket streaming for one-command deployment, integrated CosyVoice TTS + Whisper ASR to enable real-time voice conversations with conversational pace.
- Launched public demo gathered user feedback and iteratively tuned prompts to boost perceived naturalness by **~30%**.

### American Sign Language Detection (React, Django, Python, ML)

Aug 2024 – Dec 2024

- Developed a real-time ASL translator using **MediaPipe Hands** and a custom **CNN model**, achieving **over 70% accuracy** in dynamic letter prediction.
- Engineered a seamless React-powered interface with low-latency WebSocket integration, enabling real-time predictions and an interactive ASL learning experience.

### Job-Genie Job-Matching Platform (React, Node.js, MySQL, NLP)

February – Apr 2025

- Delivered a full-stack resume-to-job pipeline using intelligent PDF parsing and **TF-IDF similarity search** to rank best job matches and one-click apply, all exposed through a Tailwind/React interface and REST API (**< 100 ms median latency**).
- Developed MySQL stored procedures, triggers, and transaction logic in the backend that deduplicate applications and auto-notify users, boosting data integrity and **cutting manual review time to zero**.

## EXTRACURRICULAR ACTIVITIES & LEADERSHIP

### Treasurer, OpenSource@Illinois

August 2024 - Present

Directed budgeting to fund open-source initiatives, empowering developers to contribute and share resources. Promoted accessible technology and sustained collaborative projects benefiting the broader community.