Aryan Maheshwari

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Education

University of Wisconsin-Madison Madison, WI

Bachelor of Science in Computer Science (Honors), Data Science - CGPA: 3.72 *September 2023 – May 2027*

Technical Skills

Languages: Python, Java, JavaScript, R, Assembly, HTML/CSS
Frameworks: PyTorch, LangChain, CrewAI, React, React Native, Metro, Flask, Node.js, FastAPI, Wordpress, JUnit
Developer Tools: Git, Google Cloud Platform, Postman, VS Code, Visual Studio, PyCharm, IntelliJ, Eclipse
Libraries: Ollama (Llama 3, Mistral), scikit-learn, GroqAPI, MongoDB, NocoDB, NumPy, pandas, Matplotlib

Experience

Product Intern – Data Science May 2024 – August 2024

Aeries Technology *Remote*

- Developed and integrated a **Domain-Driven LLM** into a hospital's patient management system for Natural Language Understanding, enabling disease prediction by analyzing doctor-patient audio transcripts
- Leveraged **PyTorch** to train the **transformer-based model** on **100k+** rows of healthcare data, **achieving 15% higher accuracy than GPT-4 Omni**, with results stored in the hospital database for real-time access
- Pioneered **research** on tabular data in **RAG** models using machine learning and deep learning techniques in **Python**, leveraging the unstructured client library for preprocessing and chunking unstructured tabular data. Stored data in a **LangChain Chroma** vector database and utilized **OpenAI embeddings** for precise extraction of values from complex tables

Research

Predicate Partition Tree November 2024 – January 2025

- Innovated a novel data structure with node partitioning based on a predicate, improving search efficiency by **36% over Red-Black Trees** and **51% over B-Trees**
- Designed and implemented the **Predicate Partition Tree (PPT)** in **Java**, benchmarking its performance on datasets with **over a million values**, demonstrating substantial efficiency gains across diverse data distributions
- Authored and published a research paper documenting the **PPT algorithm**, benchmark results, and practical applications, with a **patent submitted** for the innovative data structure

Projects

AI-Powered Mock Interview System | *Multi-Agent LLMs, FastAPI, Python, React* January 2025 – Present

- Developed an AI-driven interview system that analyzes resumes, generates tailored questions, and evaluates responses in real-time. The system provides a comprehensive rating for the candidate's resume and interview performance
- Enhanced candidate preparation by simulating technical and behavioral interviews using voice-based interactions
- Designed a scalable **multi-agent framework** leveraging **FastAPI** for efficient **API** handling, **Python** for AI logic, and **React** for an interactive UI

SHIPWizard | *PyTorch, Python, FastAPI, React, N8N* November 2024 – Present

- Developed a **React**-based web app with dynamic animations and a **Python** backend, built in 24 hours at Google's CheeseHacks Hackathon, to simplify UW-Madison student insurance processes
- Engineered a **PyTorch**-based **LLM** trained with augmented SHIP data to enable coverage detail retrieval, auto-fill claims for optimal approval, and generate completed insurance documents
- Leveraged CHTC's **high-performance computing cluster** (20K+ cores, advanced GPUs) to accelerate **model training** and optimize efficiency
- Integrated **FastAPI** and **N8N** for backend automation, ensuring multi-feature workflows and enhancing user accessibility

The Intern | *Python, React, Llama3, FastAPI, Multi-Agent LLMs, Groq, N8N* June 2024 – August 2024

- Designed a **React**-based app to streamline work tasks by deploying specialized agents to summarize PDFs/PPTs, automate email responses, generate PowerPoint outlines, and answer queries
- Supported omni-channel inputs (Voice, Text, Uploading Files)
- Programmed a **multi-agent framework** of **Llama3** using **CrewAI** and **Groq** in **Python** and streamlined the backend workflow using **N8N**, with API endpoints created using **FastAPI**