

Aravinda Raman Jatavallabha

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EDUCATION

Master of Computer Science (Data Science Track) North Carolina State University, Raleigh, NC	Aug 2023-May 2025
<u>Courses</u> – Data Science, Natural Language Processing, Neural Networks, Database Management Systems	CGPA: 4.0/4.0
B. Tech in Information Technology Manipal Institute of Technology, Manipal, India	Jun 2019-Jul 2023
<u>Minor</u> : Big Data Analytics; <u>Courses</u> - Data Mining, Machine Learning, Pattern Recognition, Algorithms	CGPA: 8.64/10.0

TECHNICAL SKILLS

- **Programming Languages, Technologies & OS:** Python, SQL, Java, Spring Boot, JavaScript (basic), Angular, Flask, Docker, Git, Linux, FastAPI, REST APIs, Power BI, Azure OpenAI, AWS (S3, Sagemaker, Lambda), Snowflake
- **Libraries:** Pandas, NumPy, Matplotlib, Scikit-learn, Keras, PyTorch, TensorFlow, NLTK, PyG, SpaCy, SciPy, LangChain
- **Machine Learning:** Time Series Analysis, Classification, Regression, Convolutional Neural Networks (CNN), Natural Language Processing (NLP), Graph Neural Networks (GNN), Retrieval-Augmented Generation (RAG), Large Language Models (LLMs), Prompt Engineering
- **Training & Certifications:** [Deep Learning \(deeplearning.ai\)](https://www.deeplearning.ai), [Machine Learning \(Stanford Online\)](https://stanfordonline.org/), [AI Summer School](#)

WORK EXPERIENCE

Machine Learning Engineer Co-op SmartProtect Public Safety Solutions, Wilmington, DE	May 2024-Current
<ul style="list-style-type: none">• Developed and A/B tested time series predictive models (ARIMA, FB Prophet, LSTM) on 1.2M+ call records; deployed real-time FastAPI inference endpoints that improved scheduling accuracy by 20% and reduced dispatcher wait time by 14%.• Productionized ML pipelines using Flask APIs, AWS SageMaker, and Snowflake, cutting model retraining time by 35% via CI/CD orchestration; integrated Azure OpenAI LLMs for anomaly summarization and transcript Q&A.• Built internal ops dashboard using Spring Boot + Angular, powering live analytics for shift forecasting, LLM-driven alerts, and scheduling KPIs — used daily by 6+ teams across 3 regional call centers.• Designed optimization algorithms for staff coverage using call volume clustering and anomaly tags, lowering overtime by 18% and boosting resource utilization by 22%.• Implemented model monitoring and data drift detection using statistical checks, version tracking, and pipeline alerts — increasing post-deployment reliability by 40% and enabling auditability for compliance.	
Machine Learning Engineer Intern Defence Research and Development Organisation, Bengaluru, India	Jan 2023-Jun 2023
<ul style="list-style-type: none">• Engineered a Temporal Graph Neural Network (GNN), leveraging continuous temporal data and node features to predict future user interactions on online platforms, increasing model accuracy by 2% over current benchmarks [Paper].• Developed and integrated Incremental BERT (iBERT) with Temporal GNN to capture semantic drift and enhance real-time semantic understanding of evolving text data, reducing data processing time by 40%.• Achieved 3.19 perplexity (6% better than SOTA) in masked language modeling, published in Springer ICPR 2024 [Paper].	
Data Science Intern Merkle Inc., Bengaluru, India	May 2022-Jul 2022
<ul style="list-style-type: none">• Led a team of 4 in developing predictive models (XGBoost, LightGBM, LSTM) for revenue optimization by transforming transactional data, applying SQL indexing on 10M+ records, and leveraging LLM-based embeddings to cluster product descriptions for segment-specific targeting, resulting in a 10% increase in campaign profitability.• Processed 16M+ rows of Home Depot sales data using PySpark, improving query performance by 40% through advanced data handling techniques, generating actionable pricing insights.	

PROJECTS & PUBLICATIONS

- **Cold Email Generator** [\[Code\]](#) : Engineered a **RAG pipeline** with **LangChain**, **LLaMA**, and **ChromaDB**, automating job-skill matching. Improved **targeting precision by 40%** through JSON parsing and **vector-based retrieval**.
- **Multimodal Conversation Derailment Detection** [\[Paper\]](#): Built a hierarchical **transformer** combining **BERT**, **Faster R-CNN**, and **GRU** for multimodal Reddit thread modeling, integrating text and visual cues. Achieved 71% accuracy and 78% AUC, outperforming text-only baselines by 6% in conversational derailment detection.
- **Legal Query AI Assistant** [\[Code\]](#) : Developed a **RAG-based chatbot** using **OpenAI GPT**, **LLaMA 2**, **LangChain**, and **Pinecone**. Boosted **QA accuracy by 30%** via semantic chunking and vector retrieval from legal documents.
- **COVID-19 X-ray Detection** [\[Code\]](#) : Built a **CNN model** on **3-class X-ray dataset** (Normal, Pneumonia, COVID-19), achieving 95.3% training and 89.5% validation accuracy. Deployed a **Flask app** for real-time COVID detection from uploaded X-rays.
- **Privacy-Preserving LLM Evaluation** [\[Paper\]](#) : Analyzed **GPT-3.5**, **GPT-4**, and **Turbo** models for **PHI/PII leakage** on synthetic healthcare and hiring datasets. Achieved 60–99% privacy reduction while retaining >85 BLEU score, supporting **HIPAA/GDPR-compliant** LLM use.
- **Fair Visual Recognition via Distillation** [\[Paper\]](#): Developed Maximum Mean Discrepancy (MMD)-based Fair Distillation using **ResNet** and **ShuffleNet** architectures to mitigate **demographic bias** in **computer vision** tasks, achieving **54% bias reduction (DEO)** with competitive accuracy on UTKFace and CIFAR-10 datasets without extensive model retraining.