Nakul Kumar

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Education

Boston University, *Master of Science in Applied Data Analytics* | Boston, USA **GPA: 3.96/4.00** **Jan 2025**

- Teaching Assistant for graduate courses: Foundations of Machine Learning, Data Mining
- Coursework: Data Analytics and Visualization, Big Data Analysis, Data Science with Python, Advanced Deep Learning

R. V. College of Engineering, *Bachelor of Engineering in Computer Science* | India **CGPA: 9.04/10.00** **Aug 2022**

- Coursework: Data Structures, OS, Algorithms, OOP, DBMS, Data Science, Software Engineering, Parallel Computing

Technical Skills

Programming: Python, R, JavaScript, C, C++, SQL, XML

Machine Learning & AI: LLMs, TensorFlow, PyTorch, LangChain, LangGraph, NLP, Transformers, Gen AI, RAG

Cloud & DevOps: Node.js, AWS, GCP, Snowflake, Databricks, Azure, Docker, CI/CD, MLOps, Git, RESTful API

Data Engineering: Apache Spark, Kafka, ETL, React, SQL Optimization, Data Warehousing, Schema Design

Visualization & Analytics: Power BI, Tableau, RStudio, Data Mining, A/B Testing

Experience

Data Engineer **Aug 2022 – Mar 2023**

Mavenir Systems *Bangalore, India*

- Developed scalable pipelines and architectures using Apache Kafka for real time transformation of data collected from client's (Airtel and Verizon) network test point access units.
- Boosted network performance by 35%, optimizing real-time data flows with Prometheus and Apache Kafka.
- Optimized ETL processes, ensuing seamless data integration from network sites into structured format for analytics.
- Designed and deployed scalable ETL pipelines using Apache NiFi, enhancing data ingestion and transformation efficiency for real-time network performance analytics, resulting in a 20% reduction in processing latency

Research Intern **Feb 2022 – Aug 2022**

Purdue University *West Lafayette, IN (Remote)*

- Collaborated with a team of three to develop a SaaS-based natural language processing algorithm, transforming text data to detect vulnerabilities in GitHub workflows and enhance the CICD pipeline efficiency. [Research Paper]
- Researched and engineered AI-driven solutions to detect GitHub vulnerabilities, reducing security threats by 63%.
- Designed and implemented a Spark pipeline to secure GitHub workflows prior to committing changes to user repositories.
- Conducted research on brain tumor detection using pretrained InceptionV3 and V4 convolutional neural networks to enhance diagnostic accuracy. [Research Paper]

Software Engineer Intern **Jul 2020 – Dec 2020**

Yokogawa Technology Solutions *Bangalore, India*

- Developed a satellite vehicle density detection system in collaboration with the department of Bangalore traffic police, utilizing Scikit-learn and TensorFlow to optimize traffic flow at bottleneck junctions in city.
- Reduced city-wide traffic congestion by 12% by deploying a machine learning-based vehicle density detection system.
- Contributed to the development of a mask detection software during the COVID-19 pandemic by fine-tuning a VGG-16 convolutional network, leveraging IBM's 12-core POWER8 microprocessor for accelerated model training and execution.

Projects

Full-Stack Banking Application with Atomic Transactions | *Javascript, SQL, Node.js* **Feb 2025**

- Developed a RESTful banking application using JavaScript, SQL, HTML, and CSS, ensuring seamless handling of transactions with ACID-compliant atomicity.
- Designed and implemented secure authentication, real-time balance updates, and transaction rollback mechanisms to prevent data inconsistencies. Integrated the API with a voice-powered LLM to handle user queries.

User-Specific Text-to-Image Generation Model | *Python, Amazon Web Services, Android Studio* **Apr 2024**

- Developed and trained a stack generative adversarial network on user-specific datasets to generate images from text input, achieving an accuracy of 89% by experimenting with optimizers like ADAM, AdaGrad, and RMSProp.
- Deployed the model as a fully functional application on an Android platform, integrating a user-friendly graphical user interface.

Healthcare AI Chatbot with Llama and Transformers | *Flask, Llama, Hugging Face* **Sep 2023**

- Developed a conversational AI chatbot using Llama for medical query understanding and Hugging Face's Transformers for accurate, empathetic responses. Deployed via Flask to assist patients with appointment scheduling and FAQ's.

Certifications

- **Developing LLM-powered applications (LangChain)** - Feb 2025
- **Version Control and Code Deployment (Git and GitHub)** - Aug 2024
- **Machine Learning Master Course (Python and R)** - Jul 2023
- **TensorFlow and Keras for Deep Learning** - Aug 2021