Mayank Vyas

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EDUCATION

Arizona State University Tempe,AZ
Masters in Data Science Aug 2024 - May 2026
Statistical Learning,Natural Language Processing,Statistics,Cloud Computing,Big Data Analytics,Data Visualization

Institute of Infrastructure Technology Research and Management Ahmedabad, India
Bachelors in Electrical Engineering with minors in Computer Science Nov 2020 - May 2024
Thesis: MaskRoot: Deep Learning Pipeline for Root Phenotyping
Relevant Courses Data Structures and Algorithms,Computer Architecture,Artificial Intelligence,Distributed Systems,Linux

SKILLS

Languages Python,SQL,C++ ,R ,Javascript,Bash,Latex,HTML/CSS,VBA,YAML,Command Line,Matplotlib
AI/ML/Cloud Apache Spark,Data Modeling,Tensorflow,PyTorch,Keras,Semantics,CUDA,AWS,Agile,GCP, Snowflake,Docker,Kubernetes,Kafka
Data Tools MongoDB,ETL,Power BI, Tableau,MATLAB,Excel,Business Analytics,Data Engineering,Mathematics,Hadoop
Math Tools Mathematics, MATLAB, critical thinking,problem solving,Excel

PROFESSIONAL EXPERIENCE

Machine Learning Assistant |Data prep and Data Transfer, Deployment , Monitoring **May 2022 - January 2024**
Indian Institute of Information Technology, Chennai (Sponsored by IIT Bombay) Chennai India

Iot and Kalman Filtering Framework | Iot,Cloud Computing,Arduino,Data Transmission

- Designed a LoRaWAN fog computing architecture for smart agriculture, reducing sensor energy consumption by 40% and enhancing data transmission efficiency via lightweight regression models.
- Deployed APAEs (Analytical Prediction Algorithm) across distributed layers, slashing redundant data transmissions by 93.6% with <10% mean absolute error (MAE). Published in IEEE IoT Journal (DOI: 10.1109/JIOT.2023.10278208).
- Integrated adaptive Kalman filters on fog nodes to minimize bandwidth usage by 85%, enabling latency-sensitive decision-making for irrigation and pest control systems.

Machine Learning Framework Development | Pytorch,Predictive models

- Designed a Regressive Model (RPDM) data pipeline using TensorFlow Lite, reducing bandwidth usage by 85% in IoT networks.
- Achieved **99.97%** prediction accuracy with Decision Trees over Regression , SVM, Ensembling/Boosting, enabling edge devices to perform real-time actuation (e.g., irrigation control) during internet outages
- Implemented lightweight model compression (flat buffer files) for deployment on Raspberry Pi/Arduino, lowering power consumption by **82.89%.**

LoRa-Based Data Aggregation for Smart Agriculture (DASA) |Data Aggregation, Data Modelling, Energy Efficiency,Computer Vision

- Designed a Ward's method clustering algorithm to compress IoT sensor data by **57.39%**, deployed on fog nodes to reduce cloud transmission costs by **38%**.
- Developed Github CI/CD pipelines for ML model deployment on AWS & Azure, reducing deployment time by **40%**.Achieving **1.1s** latency for real-time field monitoring, improving response time by **35%** over traditional cellular networks.
- Tested on a 20-acre testbed, cutting energy consumption by **82.89%** at tolerance thresholds (ε=1.0)

PUBLICATIONS

- DASA: An efficient data aggregation algorithm for LoRa enabled fog layer in smart agriculture. Springer
- On Reducing Data Transmissions in Fog Enabled LoRa Based Smart Agriculture. IEEE
- Intelligent Data Forwarding Scheme for LoRa based Fog Enabled Smart Agriculture. IEEE

PROJECTS / OPEN-SOURCE

TRIM QA |LLM, RAG, Pruning, BM-25 **January 2025 - May 2025**

- **Designed and implemented** a multimodal Retrieval-Augmented Generation (RAG) pipeline to extract answers from semi-structured sources like tables, JSON files, and scraped web data, enabling flexible and context-rich query handling.
- **Integrated BM25-based retrieval** to identify relevant tables from the NQ-Tables dataset based on user queries, which improved initial candidate selection and resulted in **97% retrieval accuracy**.
- **Developed a** custom table pruning algorithm to eliminate irrelevant rows and columns by analyzing query-table relationships; this outperformed TaBERT and Sentence Transformers with **a 98% accuracy rate** in answer extraction.
- **Optimized the reranking and context delivery process** by ranking pruned tables before sending them to the LLM, reducing the average **inference latency to ~10ms** without sacrificing response quality.

Hire-Smart |React, FastAPI, BERT, FAISS, Docker, AWS, GitHub API, BeautifulSoup, Pandas, SQL Link **January 2025-May 2025**

- Designed an end-to-end **NLP candidate search engine using BERT (Hugging Face Transformers)** and **FAISS** to convert natural-language queries into embeddings, enabling real-time semantic matching across 10,000+ profiles with <100ms latency.
- Engineered a scalable data pipeline using **BeautifulSoup,** to scrape, clean, and structure 10,000+ GitHub profiles, extracting features like project complexity, commit frequency, and tech stack relevance, which improved candidate-match accuracy by **40%** for hiring teams.
- Developed a holistic applicant evaluation portal **(React frontend + FastAPI backend)** where candidates showcase GitHub activity (stars, forks, PRs) alongside resumes. Integrated a Popularity Index algorithm to auto-rank talent, cutting recruiter screening time by 60% while boosting candidate visibility for niche roles.