Shaik Zaheer Hussain

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Profile

Applied Machine Learning Engineer with strong experience in designing end-to-end AI systems spanning retrieval-augmented generation, computer vision, and generative modeling. Proven ability to reason about data, model tradeoffs, evaluation metrics, and deployment constraints in real-world settings.

Education

B.Tech in Computer Science (Data Science) *CGPA: 9.73 / 10*
C R Rao AIMSCS, Hyderabad
Relevant Coursework: Machine Learning, Deep Learning, Artificial Intelligence, Data Mining, Database Systems

Experience

Research Intern — DRDO (Directorate of AI & Drones)

- Designed and benchmarked real-time object detection pipelines using **YOLO** and **RT-DETR**, focusing on robustness under motion blur and low-quality inputs.
- Integrated motion deblurring and super-resolution modules to improve downstream detection reliability.
- Analyzed failure cases and explored **Explainable AI (XAI)** techniques to interpret model predictions.

Summer Research Intern — Indian Institute of Space Science and Technology (IIST)

- Built a **DCGAN-based EEG data augmentation pipeline** to address data scarcity and cross-subject variability in a Telugu Vocal BCI dataset.
- Developed deep learning classifiers evaluated using **Leave-One-Subject-Out (LOSO)** protocols for robust generalization.
- Implemented an end-to-end BCI workflow including EEG preprocessing, conditional GAN training, synthetic data generation, and t-SNE visualization.

LLM Intern — SB Solutions

- Fine-tuned Large Language Models for **natural language to SQL** translation tasks.
- Achieved **78% transformation accuracy** and integrated the model into a production analytics workflow.

AI Automation Intern — SB Solutions

- Developed AI-driven automation tools and cloud-integrated workflows.
- Optimized backend data pipelines and improved system responsiveness.

Campus Lead — Google Developer Groups (GDG)

- Led campus initiatives promoting AI, machine learning, and open-source development.
- Organized technical workshops and hands-on sessions on data science and full-stack systems.

Projects

Adaptive Multimodal Retrieval-Augmented Generation (RAG) System

- Designed an adaptive RAG system incorporating **semantic chunking** and **fusion-based retrieval** across heterogeneous document sources.
- Implemented query-aware routing to dynamically select retrievers and retrieval depth, balancing **answer accuracy vs. latency**.
- Built evaluation pipelines to analyze retrieval quality, hallucination cases, and end-to-end system performance.

Object Detection & Robustness Benchmarking Pipeline

- Benchmarked **RT-DETR** and **YOLO** models under varying image degradations including motion blur.
- Analyzed accuracy–latency tradeoffs and documented deployment-oriented failure modes.

EEG Data Augmentation using Conditional GANs

- Investigated **distribution shift** and generalization in EEG classification using GAN-generated synthetic data.
- Evaluated classifier performance under cross-subject settings and analyzed statistical consistency of generated samples.

Fortunix — AI-Backed Financial Decision Support Platform

- Built a modular AI system integrating **RAG pipelines** and LLM-based agents to deliver contextual financial insights.
- Focused on explainability and extensibility for real-world decision support scenarios.

Technical Skills

Programming: Python, Java, C, R, JavaScript (Node.js)
Machine Learning: PyTorch, Scikit-learn, NumPy, Pandas
Computer Vision: YOLO, RT-DETR, OpenCV
LLMs & NLP: Retrieval-Augmented Generation, LLM fine-tuning, prompt engineering
Databases: MongoDB, SQL
Tools & Platforms: Docker, FastAPI, Git, GCP (basic)

Certifications

IBM Machine Learning (ML0101EN) — Python for Data Science — IBM
Data Science Workshop — RemarkSkill x FCC IITH — R Programming A–Z — Udemy