Shifa Mehreen

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Education

University of Maryland, College Park — College Park, MD
Master of Science in Data Science; GPA: 3.94/4.0 — *Aug. 2024 – May 2026*

GITAM University — Visakhapatnam, India
Bachelor of Technology in Computer Science; GPA: 9.20/10 — *Jun. 2019 – Jun. 2023*

Experience

University of Maryland — College Park, MD
Graduate Assistant - Academic Achievement Programs — *Aug. 2024 – May 2026*

- Conducted A/B testing comparing different pedagogical approaches (visual vs. procedural explanations) and tracked student outcomes, improving problem-solving accuracy by 15% for visual learning group.
- Developing Decode, an AI-powered notebook application using Vision-LLMs to provide real-time mistake detection and personalized hints on handwritten work, eliminating need for manual uploads through lasso-based selection interface.
- Tutored and mentored 100+ undergraduate students in calculus and statistics, analyzing performance patterns to identify common conceptual gaps and misconceptions across cohorts.

Tata Elxsi — Trivandrum, India
Machine Learning Engineer — *Jun. 2023 – Jun. 2024*

- Architected end-to-end ML pipeline for autonomous agricultural systems, processing 20000+ annotated LiDAR point clouds to achieve 87% segmentation accuracy for vegetation-road classification using PointNet++.
- Optimized point cloud processing with Open3D voxel downsampling and CUDA-accelerated C++ executables, reducing inference time by 40% for real-time deployment on Nvidia Jetson AGX Orin.
- Engineered synthetic data generation workflow using Blender and Gazebo, expanding training dataset by 3x to improve model generalization across diverse farming scenarios.

Machine Learning Intern — *Feb. 2023 – Jun. 2023*

- Developed computer vision automation tool for rail signaling validation, reducing manual testing time by 65% through CNNs built with TensorFlow and Keras, achieving 92% detection accuracy across 500+ test scenarios.

Projects

VISTA: Spatio-Temporal RAG for Video | *Gemini , OpenCV, RAG, Agentic AI*| Link

- Designed a Spatio-Temporal RAG system adding a persistent memory layer to frontier models for egocentric video understanding - tracking objects, spatial orientation, and temporal context via allocentric heading and scene graphs.
- Reached **93.3%** accuracy (14/15) on spatial-temporal reasoning—answering object-permanence and directional queries that Gemini 3 Flash and Molmo fail—while processing 10-min video in less than 40s.

Cloud Orchestrator | *Google Gemini 2.5 Flash, ADK, GCP, Multi-Agent Systems* | Link

- Built multi-agent AI system translating natural language into executable GCP infrastructure DAGs across 20+ services (Vertex AI, GKE, BigQuery), reducing cloud setup time by 95% through automated tool orchestration.

FeedForward | *GPT-4o, LangChain, Flask, Node.js, MySQL (AWS RDS)* | Link

- Developed multilingual AI agent platform with voice, chat, and web interfaces for food bank operations, automating form processing and achieving less than 2s response latency using OpenAI APIs and Twilio integration.

Olympiad Reasoner | *Qwen 2.5, DeepSeek R1, LoRA, ReAct, ToRA* | Kaggle

- Fine-tuned 5 LLMs with LoRA on 10K ReAct+ToRA samples for National Olympiad-level math reasoning, implementing weighted self-consistency ensemble that improved leaderboard ranking by 350 positions.

Technical Skills

Languages: Python, SQL, R, JavaScript, Java
ML/AI Frameworks: PyTorch, TensorFlow, Keras, Scikit-learn, OpenCV, Open3D, Pandas, NumPy, Matplotlib, Seaborn, HuggingFace
LLM & GenAI: Fine-tuning, LoRA, PEFT, RAG, Prompt Engineering, LangChain, Multi-Agent Systems, VLMs, GPT, Gemini, Qwen, DeepSeek, Stability AI
Data Tools & Databases: MySQL, Statistical Modeling, A/B Testing, Hypothesis Testing
Development Tools: Flask, Node.js, Git/GitHub, ROS, PCL, RViz

Achievements

Runner-Up, AI Spatial Intelligence Hackathon 2026 (Ironsite & UMD Startup Shell)
Runner-Up, UMD AI & Food Insecurity Case Competition 2025 (Smith School & Capital Area Food Bank)
Winner, JP Morgan Chase CodeForGood Hackathon