

Ahmed Farooq

M.S. Computer Science, NUST-SEECS | B.S. Electrical Engineering | AI/ML & Intelligent Systems
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Research Profile

M.S. Computer Science student at NUST-SEECS with a B.S. in Electrical Engineering and foundations in signal processing, mathematics, algorithms, and analytical problem solving. Undergraduate research experience in energy optimization for UAV swarm networks using metaheuristics and machine learning. Hands-on experience with machine learning, NLP, computer vision, RAG, data engineering, and scalable systems; interested in applying AI/ML and computational methods to resource allocation, distributed intelligence, ISAC, and next-generation wireless networks.

Research Interests

- AI/ML for wireless communications and 6G
- Reinforcement / deep reinforcement learning
- Resource allocation and interference management
- UAV swarm networks and energy-efficient design
- Integrated Sensing and Communication (ISAC)
- Federated and distributed learning
- Signal processing and intelligent communication systems
- Metaheuristic and ML-based optimization

Education

National University of Sciences and Technology (NUST), SEECS **2026 to Present**
M.S. Computer Science *Islamabad, Pakistan*
• Focus: algorithms, scalable systems, AI infrastructure, and AI-driven system design.

Mirpur University of Science & Technology (MUST) **2020 to 2024**
B.S. Electrical Engineering *Mirpur, Pakistan*
• Foundation in signal processing, mathematics, data structures and algorithms, and analytical problem solving.

Research & Technical Experience

Undergraduate Research: UAV Swarm Energy Optimization **2023**
Supervisor: Dr. Tamoor Shafique *University of Staffordshire, UK*
• Investigated methods to extend the battery life of drone nodes in UAV swarm networks, benchmarking new approaches against the Harris Hawks Optimization (HHO) metaheuristic.
• Designed and evaluated genetic algorithms, fuzzy logic, decision trees, and convolutional neural networks to predict and reduce node energy consumption.
• Implemented and compared simulations in MATLAB, Octave, and Python; analyzed results against the HHO baseline.

Rev9 Solutions | Associate Software Engineer *Pakistan* | **Feb 2025 to Present**
• Developed LLM-powered CRM intelligence workflows and context-construction pipelines grounded in structured customer, behavioral, CRM, and lead-status data.
• Developed computer-vision pipelines for skin-tone and undertone analysis, including a custom Monk Skin Tone detection system and an end-to-end dataset workflow for preprocessing, normalization, transformation, and labeling preparation.
• Architected a Go synchronization engine supporting 70+ CRM accounts and approximately 5 million contacts under constrained compute resources; reduced a critical database query from roughly 3 minutes to 8 seconds.

Instech | AI Engineer (Part-time) *Remote* | **Mar 2026 to Jul 2026**
• Developed a production RAG system over 100,000+ legal files, covering ingestion, chunking, embeddings, retrieval, context construction, and LLM generation.
• Designed retrieval and grounding strategies around source relevance, context-window utilization, latency, and reduction of unsupported responses.

Freelance | Machine Learning & AI Engineer *Remote* | **2020 to Present**
• Built NLP classifiers for harmful and biased language and owned end-to-end ML workflows spanning data preparation, training, experimentation, evaluation, inference, and integration.
• Developed personalized AI image-generation workflows with custom model training/fine-tuning and asynchronous training and inference pipelines.

Technical Skills

Programming	Python, MATLAB, Octave, Go, TypeScript, JavaScript, SQL
Machine Learning	CNNs, decision trees, NLP, computer vision, feature engineering, model evaluation
Optimization	Genetic algorithms, Harris Hawks Optimization, fuzzy logic, simulation-based evaluation
Generative AI	RAG, LLM grounding, embeddings, vector search, LangChain, LangGraph, Pinecone
Data & Systems	PostgreSQL, MongoDB, Redis, BullMQ, distributed and event-driven architecture
Cloud & Foundations	Docker, AWS, GCP, Linux, Git; signal processing, mathematics, algorithms, data structures