

MUHAMMAD RAKEH SALEEM *Ph.D.*

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Summary

Applied ML Engineer and Data Scientist with a Ph.D. and 5+ years advancing deep learning, computer vision, and time-series forecasting systems across research and industry. Author of 11 peer-reviewed publications (300+ citations) with invited talks at **ETH Zurich** and **Thornton Tomasetti**. Experienced across the full production lifecycle — scalable data engineering (Snowflake), advanced architectures (Transformers, LSTM, LightGBM ensembles), and end-to-end MLOps on **AWS SageMaker** — most recently deploying a production demand-forecasting pipeline for aviation MRO and an end-to-end **document AI pipeline** for PII redaction using vision-language models (LayoutLMv3 and Qwen-VL). Translates research rigor into ML systems that drive real operational and business decisions.

Software & Technical Skills

Programming & Data: Python (Pandas, NumPy, Scikit-learn), SQL, C++, MATLAB, Git, Power BI

ML Frameworks: PyTorch, TensorFlow, Transformers (TFT, ViT), LSTM, LightGBM, Hugging Face (fine-tuning), Optuna

Time Series & Forecasting: demand forecasting (intermittent demand), probabilistic forecasting, uncertainty quantification (conformal prediction), Matrix Profile (motif & anomaly detection)

Computer Vision & VLMs: Qwen-VL, LayoutLMv3, Florence-2, PaddleOCR, docTR, object detection, Document AI

MLOps & Cloud: AWS (SageMaker, S3, CloudWatch), Snowflake, MLflow, Docker, CI/CD, ETL pipelines, batch inference & model monitoring

Work Experience

Data Scientist

Dec 2025 – Jul 2026

GA Telesis – Digital Innovation Group

Fort Lauderdale, FL

- Delivered production MVP for **intermittent demand forecasting** in 3.5 months — multi-horizon **Transformer/TFT ensemble** on SageMaker; **76%** of SKU forecasts fell within actual demand range over a 3-month horizon.
- Led Phase-2 expansion (LSTM, LightGBM), improving Transformer by **6.5%** and TFT by **11%** over MVP baseline.
- Proposed and designed an end-to-end **Document AI PoC** for on-premise PII redaction of aviation documents — fine-tuned **LayoutLMv3** + PaddleOCR on 1,800 annotated images; benchmarked vs. **Qwen-VL**, **Florence-2** on 50K+ documents.
- Authored build-vs-buy analysis from PoC results (~4-year on-premise break-even vs. cloud VLM APIs), informing HQ document-processing strategy for privacy-sensitive workloads.
- Built MLOps backbone: Snowflake-to-S3 ETL, MLflow tracking, automated batch inference, Power BI dashboards for forecasts and prediction intervals to demand planners.

Independent Researcher

Jan 2025 – Nov 2025

Self-directed Research

Remote

- Extended doctoral research on **gaze-informed computer vision** — built a working Python prototype simulating expert inspector attention patterns for training inspection models.
- Peer-reviewed computer vision manuscripts for academic journals; deepened production ML skills (**AWS**, **MLOps**, **time-series forecasting**) in preparation for industry transition.

Doctoral Researcher (Ph.D., Structural Engineering)

Sep 2020 – Dec 2024

Pennsylvania State University — BEAM Lab

State College, PA

- Developed **gaze-supervised computer vision** models for automated structural damage assessment — used eye-tracking data from expert building inspectors to guide CNN attention, improving generalization to unseen structures.
- Optimized Deep CNN architectures for high-resolution visual anomaly detection, **reducing inference latency by 20%** at **85% detection accuracy** for edge deployment.
- Built multimodal pipelines synchronizing eye-tracking telemetry with UAV video streams; led **industry-backed research** projects and mentored **8 undergraduate researchers**.

Graduate Researcher

Sep 2018 – Aug 2020

Chung-Ang University

Seoul, S. Korea

- Deployed real-time deep convolutional neural networks (CNNs) for automated safety monitoring on edge devices, achieving a **25% improvement** in dynamic risk detection speed.
- Built the end-to-end data acquisition and processing pipeline for a UAV imaging system, utilizing custom image stitching algorithms to process high-resolution geospatial datasets from **50+ inspection flights**.

Development Engineer

Feb 2018 – May 2018

National University of Science and Technology (NUST)

Islamabad, Pakistan

- Engineered a wireless, time-critical sensor system for fault identification, deploying an embedded C++ solution on edge microcontrollers that achieved **97% data transmission reliability**.

Education

Pennsylvania State University

Ph.D. in Architectural Engineering

Aug 2020 – Dec 2024

State College, PA

Chung-Ang University

M.S. in Structural Engineering

Sep 2018 – Jun 2020

Seoul, South Korea

Bahria University

B.S. in Electrical Engineering

Aug 2013 – Jun 2017

Islamabad, Pakistan

Research & Recognition

- **Publications:** 11 peer-reviewed articles, **300+ citations** (*Scientific Reports, Structural Health Monitoring, Journal of Building Engineering*) – full list: [Google Scholar](#).
- **Invited Talks:** **ETH Zurich** (2023) – eye tracking for structural health monitoring; **Thornton Tomasetti** (2024) – AI-enabled damage detection using eye tracking.