# Muhammad Jahanzaib Awan

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## PROFESSIONAL SUMMARY

MSc Artificial Intelligence candidate (De Montfort University) specialising in deep learning, computer vision, and explainable AI for medical imaging. Hands-on experience building and benchmarking models across CNNs, Transformers, and sequence architectures in PyTorch, with a track record of distinction-level coursework (70–95%). Seeking a Machine Learning Engineer / Data Scientist graduate role to apply rigorous, evaluation-driven model development.

## EDUCATION

**MSc Artificial Intelligence — De Montfort University, Leicester, UK** *Sep 2025 — Sep 2026 (expected)*

- Modules: Applied AI, Neural Systems, Natural Language Processing, Evolutionary Computing, Fuzzy Logic, Intelligent Mobile Robots, Mobile Robots, Research Methods — all assessed in the 70–95% range.

**BSc (Hons) Computer Science — Government College University Faisalabad, Pakistan** *2017 — 2021 · CGPA 3.09 / 4.0*

## TECHNICAL PROJECTS

**Anatomically-Gated Vision Transformers for Explainable Lung-Nodule Detection — MSc Final Project**

PyTorch · MONAI · timm · Weights & Biases · 2026

- Designing a Vision Transformer that gates attention with anatomical lung masks to improve explainability of lung-nodule detection on chest radiographs (NIH ChestX-ray14, 112K+ images, 14 pathologies).
- Building a reproducible training pipeline with experiment tracking, transfer learning from pretrained backbones, and clinician-interpretable saliency outputs.

**Dialogue Generation: GRU vs LSTM vs GPT-2 (LoRA) — Natural Language Processing**

PyTorch · Hugging Face Transformers · PEFT/LoRA · 2026

- Built and compared three conversational models; a from-scratch Seq2Seq GRU achieved the best quality (perplexity 12.39, BLEU 3.35%, cosine similarity 0.40), outperforming a 355M-parameter GPT-2 by 2.8× on BLEU.
- Demonstrated that task-specific encoder–decoder design beat parameter-efficient fine-tuning of a larger pretrained model, with full evaluation across BLEU, perplexity and semantic similarity.

**UAV Aerial Object Classification — Applied AI**

PyTorch · scikit-learn · 2026

- Built a 7-class image-classification dataset (8,903 cropped objects) from a 146-frame UAV sequence with severe class imbalance (car 42% vs bicycle 1%).
- Benchmarked ResNet18, MobileNetV2 and EfficientNet-B0 transfer learning against a HOG + SVM/Random-Forest classical baseline, reporting macro-F1 and per-class metrics.
- Engineered a leakage-aware, track-ID group split and quantified the accuracy inflation caused by naïve random splitting — the key methodological contribution.

**Mobile Robot Localization: AMCL vs EKF vs Hector SLAM — Intelligent Mobile Robots**

ROS · Gazebo · TurtleBot3 · Python · 2026

- Deployed and compared three localization methods on a TurtleBot3 in simulation, logging Euclidean and orientation error against Gazebo ground truth across 1,100+ samples.
- EKF achieved 0.0047 m mean position error; analysed each method's trade-offs (odometry drift, scan-matching offset) to recommend AMCL for known-map deployment.

**Particle Swarm Optimization on Rastrigin — Evolutionary Computing**

MATLAB · 2025

- Implemented PSO and tuned inertia/damping parameters, cutting convergence from 173 to 16 iterations — a 90.8% improvement — validated over multiple runs with summary statistics.

### Traffic-Signal Fuzzy Inference System — Fuzzy Logic

MATLAB Fuzzy Logic Toolbox · 2026

- Designed a Mamdani fuzzy controller for adaptive traffic-signal timing: membership-function design, operator/defuzzification comparison and system evaluation (assessed distinction).

**Additional projects:** Fashion-MNIST neural classifier (Neural Systems); PID wall-following controller in MATLAB + CoppeliaSim (Mobile Robots); empirical research proposal (Research Methods).

## TECHNICAL SKILLS

**Languages:** Python, R, SQL, MATLAB

**ML / Deep Learning:** PyTorch, MONAI, timm, Hugging Face Transformers, PEFT/LoRA, scikit-learn

**Data & Analytics:** Tableau, data visualisation, exploratory data analysis, SQL querying

**Domains:** Computer Vision, Natural Language Processing, Medical Imaging, Explainable AI, Robotics, Data Analytics, Fuzzy Systems

**Tooling:** Git/GitHub, Weights & Biases, Google Colab, Jupyter, LaTeX, ROS, Gazebo, CoppeliaSim

*References available on request.*