Muhammad Huzaifa Jawad

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Research Interests

- Wireless sensing and signal-based human activity recognition
- Computer vision for human activity and behavior recognition
- Multimodal learning from video and wearable sensor streams
- Interpretable and robust deep learning under distribution shift

Education

Master of Science in Data Science
Nazarbayev University, Kazakhstan 2024–2026
Relevant Coursework: Computer Vision, Intelligent Systems, Big Data Analytics, Natural Language Processing, Probability & Statistics

Bachelor of Science in Computer Systems Engineering
UET Peshawar, Pakistan 2018–2022

Research Experience

Research Assistant
Nazarbayev University — Prof. Adnan Yazici June 2026
Multimodal Human Activity Recognition for Smart-Care Systems

- Built a multimodal HAR pipeline on the C-MHAD dataset (IMU + RGB video, 7 transition activities).
- Designed a learned GatedFusion head that achieved 86.2% Detection F1 under leave-one-subject-out evaluation, a +4.9% gain over the LOSO-tuned MAX late-fusion baseline (81.4%)
- Prepared Beamer LaTeX presentations to support Prof. Yazici's teaching, including a 49-slide deck on the HAR project and contributions to an 84+ slide "AI in Education" presentation

Graduate Research Assistant
Nazarbayev University — Prof. Ernazar Abdikamalov May 2025 – Jul 2025
Gravitational Wave EOS Classification (MSc Thesis)

- Built a 2D CNN on CWT scalograms classifying nuclear equations of state from core-collapse supernova signals at >95% accuracy
- Used Grad-CAM and integrated gradients to confirm model decisions reflected physically meaningful signal structure rather than dataset artifacts

Graduate Research Assistant
Nazarbayev University — Prof. Mehdi Bagheri Aug 2025 – Dec 2025
Bias Correction of CMIP6 Climate Model Outputs

- Built a CNN–LSTM model with a custom variance-preserving loss to correct systematic temperature errors in climate model outputs
- Reduced mean temperature bias from 4.58K to −0.09K; RMSE dropped by 37%

Research Trainee
National Taipei University of Technology (NTUT), Taiwan Dec 2023–Present
Computer Vision under Adverse Weather Conditions

- Built a crowd counting model robust to rain by generating synthetic weather conditions with OpenCV to cover distributions absent from the training data
- Evaluated model performance across a range of visibility levels to identify exactly where the learned representation broke down under distribution shift
- Findings directly inform deployment of vision systems in uncontrolled real-world environments, including assistive technology contexts

Research Assistant
Secured IoT Devices Lab, NCCS, UET Peshawar Jan 2023 – Nov 2023

- Trained and benchmarked ML models on embedded hardware under tight memory and compute constraints
- Ran ablation studies to identify which components mattered most under resource limitations

Publications

Amangeldi, A., Taigonyrov, A., Jawad, M.H., Mbonu, C.E. (2025).
CNN and Vision Transformer Efficiency Study on Tiny ImageNet and DermaMNIST Datasets.
arXiv:2505.08259

Technical Skills

Programming: Python, MATLAB, C++
Frameworks: PyTorch, TensorFlow, Keras
Libraries: NumPy, Pandas, Scikit-learn, OpenCV
Methods: Multimodal fusion, 3D CNN, CNN–LSTM, Grad-CAM, integrated gradients, cross-validation, hyperparameter optimization (Optuna), CWT, custom loss design
Tools: Git, Linux, Jupyter Notebook, Google Colab