



MUNEEB AHMED KHAN

Graduate Research Assistant | Pervasive Intelligence (Pi) Lab

📍 Sangmyung University, Korea

✉️ Mail | 🌐 Website | 📄 Google Scholar | 🏠 R^G ResearchGate | 📞 +821032287461

EDUCATION

- **Ph.D. in Software (Machine Learning & Computer Vision)** 2025
 - Sangmyung University, Cheonan, Korea
 - **Dissertation:** Efficient and Interpretable Deep Learning Frameworks for Resource-Constrained and Time-sensitive Vision Applications
 - **Advisor:** Dr. Heemin Park
- **Master of Science in Information Technology** 2019
 - National University of Science and Technology (NUST), Islamabad, Pakistan
 - **Thesis:** Prediction based Target Tracking in Wireless Sensor Network
- **Bachelor of Computer Engineering** 2014
 - COMSATS Institute of Information Technology (CIIT), Lahore, Pakistan

TECHNICAL SKILLS

- **CV Libraries:** OpenCV, Keras, scikit-image, Pillow, NumPy
- **ML Frameworks:** TensorFlow, PyTorch, Keras, Python, Pandas
- **LLM & Vision-Language:** Hugging Face Transformers, PEFT, LoRA, QLoRA, Vision Transformers (ViTs)
- **Explainable AI:** Grad-CAM, LIME, Integrated Gradients
- **Computer Vision:** Object detection and classification, Image segmentation, Visual Intelligence Systems
- **Algorithms:** Attention Mechanisms, Transfer & Reinforcement Learning, Semi-supervised Learning
- **Deep Learning:** SSD, YOLOX, YOLO-NAS, Faster R-CNN, Transfer learning, Attention mechanisms
- **Efficient Model Design:** Lightweight Architecture design, Model Optimization and Quantization
- **Research Tools:** Matlab, Google Cloud Platform (GCP), CUDA, Git, LaTeX, Jupyter Notebook
- **Data Science:** Data collection, Data Cleaning and Labeling, Feature Engineering and Visualization

SELECTED PUBLICATIONS

TOTAL: 23 PUBLICATIONS

- [1] MA Khan, et al. "Traffic Sign Recognition Under Visual Perturbations: Shadows, Light Patches, and Simulated Obstructions." *In Proceedings of the Computer Vision and Pattern Recognition (CVPR) Workshops*, 2025. [\[Link\]](#)
- [2] MA Khan, et al. "M-GAID: A Real-World Dataset for Ghosting Artifact Detection and Removal in Mobile Imaging." *In Proceedings of the Winter Conference on Applications of Computer Vision (WACV) Workshops*, 2025. [\[Link\]](#)
- [3] MA Khan, H Park. "Adaptive Channel Attention and Multi-Path Convolutional Architecture for Brain Tumor Detection Using MRI Images." *Springer Multimedia Tools and Applications*. IF: 3.0 [\[Link\]](#)
- [4] U Ejaz, MA Khan, H Park, H Kim. "FireXplainer: An Interpretable Approach for Detection of Wildfires." *Korea Computer Congress (KCC)*, pp. 1109-1111. 2023. [\[Link\]](#) (Best Paper Award)

Full publication list available at [Webiste](#)

RESEARCH & INDUSTRIAL EXPERIENCE

- **Objective Quality Metrics for Ghosting Artifacts in Video and HDR Images** June 2023 – May 2024
Research Funding: Google Korea
Tools: PyTorch, OpenCV, scikit-image, NumPy, Pandas
 - Built a dataset of 2,500+ real images and annotated over 37,000 patches for spatial/temporal artifact detection.
 - Designed data pipelines for collection, annotation, and feature extraction from diverse imaging sources.
 - Trained SOTA deep learning models for domain specific tasks (e.g ghosting artifacts, object detection)
 - Developed a test framework simulating multiple camera noise conditions for robust artifact evaluation.

- **Multi-Scale Attention Model for Low-Light Image Enhancement** 2024
Tools: PyTorch, LoL Dataset v1/v2, GCP A100, SSIM, MS-SSIM, LPIPS
 - Designed a lightweight model achieving 0.88 SSIM, 0.93 MS-SSIM, 0.207 LPIPS on LoL datasets using GCP A100.
 - Worked on integrating attention Mechanisms and transfer learning.
 - Implemented an adaptive enhancement pipeline balancing perceptual quality and computational efficiency.
 - Reviewed and implemented AAAI, CVPR, and ICCV research papers to optimize model performance.
- **Traffic Sign Recognition with Advanced Neural Network Techniques** 2022 – 2024
Tools: TensorFlow, OpenCV, Grad-CAM, LIME, GTSRB, ITSD, PTSD
 - Developed an interpretable CNN (2.6M parameters) achieving 98.4% accuracy and 74.34 ms inference.
 - Streamlined ML model development and deployment with MLflow for tracking and reproducibility.
 - Optimize GPU acceleration and parallel processing to optimize the system performance.
- **Brain Tumor Detection Using Magnetic Resonance Imaging** 2023 – 2024
Tools: TensorFlow, Keras, Grad-CAM, LIME
 - Developed a lightweight convolutional block architecture achieving 99.51% mAP with 17.2 ms inference speed.
 - Performed tumor segmentation, lesion classification, and anomaly detection in multi-modal MRI sequences.
 - Reduced false positives by 78% using explainable AI techniques (Grad-CAM, LIME).
- **FireXplainNet: Interpretable Wildfire Detection System** 2022 – 2023
Tools: PyTorch, Grad-CAM, Matplotlib
 - Developed a lightweight interpretable CNN (5.3M parameters) for early wildfire detection.
 - Applied gradient-based attribution (Grad-CAM) for decision explainability in high-risk outdoor scenarios.
 - Achieved high accuracy under variable conditions; received Best Paper Award at KCC 2023.

CURRENT PROJECTS

- **Post-Processing Methods for Artifact Removal Using Machine Learning** @Google Korea & Pi Lab, Korea
Research Funding: Google Korea
 - Investigating machine learning techniques for suppressing noise, ghosting, and compression artifacts.
 - Optimized artifact removal performance across diverse imaging modalities.
 - Designed deployment strategies suitable for mobile and resource-constrained environments.
- **Vision-Language Model Fine-tuning with Parameter-Efficient Techniques** @ Pi Lab, Korea
Tools: PyTorch, Hugging Face Transformers, LoRA, QLoRA, PEFT, Vision Transformers
 - Developing efficient fine-tuning strategies for large vision-language models using LoRA and QLoRA techniques.
 - Implementing PEFT methods to adapt pre-trained models for domain-specific CV tasks.
 - Investigating adapter-based approaches for multi-modal understanding in resource-constrained environments.
- **Partial Diffusion Model Architecture for Image Super-Resolution**
 - Developing partial diffusion techniques for image resolution enhancement.
 - Optimizing computational efficiency for deployment with limited resources.
 - Quantifying diagnostic value improvements through clinical partner collaboration.

RESEARCH FUNDING & HONORS

- **Google Korea Research Grant** (2024-2025): "Post-Processing Methods for Artifact Removal"
- **Google Korea Research Grant** (2023-2024): "Objective Quality Metrics for Ghosting Artifacts"
- **Best Paper Award** (2023): "FireXplainer: An Interpretable Approach for Detection of Wildfires" KCC, Jeju, Korea
- **Professor Scholarship for Ph.D.** (2021-2025): Pi-Lab, Sangmyung University
- **DURE Scholarship** (2022-2023): For international collaboration with Mongolia
- **Teaching Assistant Scholarship** (2021-2022): Department of Software, Sangmyung University

CONFERENCE PARTICIPATION

- WACV'25, CVPR'23, KCC'23, ICWSM'22, KCC'22, WWW'21, AAAI'21, CSCW'21

REFERENCES

Dr. Heemin Park
Professor, Department of Software
Sangmyung University, Korea
heemin@smu.ac.kr (Ph.D. Advisor)

Dr. Muazzam A. Khan Khattak
Professor, Department of Computer Science
Quaid-i-Azam University, Pakistan
muazzam.khattak@qau.edu.pk