Mobeen Ahmad

Machine Learning Researcher

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Work Experience

PYLER *Aug 2022 – Present*
ML Researcher *Seoul, South Korea*

- Lead research on fine-tuning and scaling large vision–language models (Qwen-VL, GPT-based) using Hugging Face, LoRA, Accelerate, and distributed training across multi-GPU clusters.
- Designed and maintained end-to-end ML pipelines, including data crawling, curation, WebDataset preparation, fine-tuning, evaluation, and large-scale batch inference.
- Extended NVIDIA NeMo Curator with text embedding capabilities and built modular multi-node GPU inference pipelines with Dask.
- Developed neighbor-based retrieval and large-scale evaluation pipelines, enabling coverage analysis and interpretability of classification outputs.
- Implemented distributed hyperparameter optimization with Ray Tune + Optuna; integrated CI/CD and automated experiment tracking with MLflow and Kubeflow.
- Applied retrieval-augmented generation (RAG) and instruction-tuning methods to multi-label classification with explanation generation for real-world datasets.
- Achieved state-of-the-art results on 4 VideoQA benchmarks with a novel temporal fusion method; published at **ICCV** 2023 workshop.

Dabeeo *2020 – 2021*
Deep Learning Engineer *Seoul, South Korea*

- Enhanced satellite image analytics by applying super-resolution and denoising, improving performance of detection, segmentation, and change recognition tasks.
- Designed image-to-image translation and style transfer methods for geospatial data preprocessing.

Vision & Image Processing Lab, Sejong University *2017 – 2022*
Research Assistant *Seoul, South Korea*

- Proposed Binary Crow Search Algorithm for Neural Architecture Search, published in **IEEE Access**.
- Designed GAN-based disguised face generation system and a novel unit-class loss function improving heterogeneous face recognition by 3%.

Education

Ph.D. Computer Engineering *Sejong University, Seoul*
Doctoral degree program *2017 – 2022*
Thesis: Ph.D. Thesis: Deep Learning Automation via Data, Design, and Process Optimization.

MS Robotics and Intelligent Machine Engineering *NUST, Islamabad*
Master's degree program *2014 – 2016*
Thesis: Implementation of Human Detection with Comparative Study on Different Hardware Boards

BS Computer Engineering *COMSATS University, Lahore*
Bachelor's degree program *2009 – 2013*
Thesis: Implementation of AES-128 Encryptor/Decryptor on FPGA

Select Publications

- **Mobeen Ahmad**, Geonwoo Park, Dongchan Park, and Sanguk Park. MMTF:Multi-Modal Temporal Commonsense Video Question Answering. In 2023 IEEE/CVF International Conference on Computer Vision Workshops (**ICCVW**). IEEE, 2023.
- **Mobeen Ahmad**, Muhammad Abdullah, Hyeonjoon Moon, and Dongil Han. Plant disease detection in imbalanced datasets using efficient convolutional neural networks with stepwise transfer learning. **IEEE Access**, 9:140565–140580, 2021.
- **Mobeen Ahmad**, Muhammad Abdullah, Hyeonjoon Moon, Seong Joon Yoo, and Dongil Han. Image classification based on automatic neural architecture search using binary crow search algorithm. **IEEE Access**, 8:189891–189912, 2020.
- Usman Cheema, **Mobeen Ahmad**, Dongil Han, and Seungbin Moon. Heterogeneous visible-thermal and visible-infrared face recognition using cross-modality discriminator network and unit-class loss. **Computational Intelligence and Neuroscience**, 2022.

Patents

- Co-inventor, "Electronic device and operation method for multimodal temporal-axis fusion AI models", U.S. Patent No. 12,299,967 (Granted May 2025) and Korean Patent No. 10-2812533 (Granted May 2025).
- Co-inventor, "Electronic device for multi-modal temporal-axis fusion artificial intelligence models and operation method thereof," Korean Patent No. 10-2721151, granted Oct 2024.
- Co-inventor, "Apparatus and method for generating a learning model for classifying images using transfer learning," Korean Patent No. 10-2641533, granted Feb 2024.
- Co-inventor, "Apparatus and method for generating images using generative adversarial network and quality filtering," Korean Patent No. 10-2704657, granted Sep 2024.
- Co-inventor, "Method and apparatus for automatic design of artificial neural network structure based on crow search algorithm," Korean Patent No. 10-2694148, granted Aug 2024.
- Co-inventor, "Apparatus and method for generating images using generative adversarial network," Korean Patent No. 10-2541665, granted Jun 2023.

Technical Skills

Programming Languages	Python
Machine Learning	PyTorch, Transformers, LoRA, Accelerate, DeepSpeed, Ray, Optuna
MLOps & Infrastructure	Kubeflow, MLflow, Docker, Kubernetes, CI/CD, Dask, Distributed Training
Databases & Retrieval	Pinecone, FAISS, Vector Databases
Development	FastAPI, Git, Linux, REST APIs