Mobeen Ahmad

Machine Learning Researcher

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Work Experience

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

- Video-Language Representation Learning (building on top of large language & vision models)
  - Image/Video Question Answering
  - Image/Video Captioning
  - Image/Video-Text Retrieval
- Developed a temporal fusion technique to fuse video and text features which achieved SOTA on 4 public VideoQA datasets, paper accepted at **ICCV** 2023 workshop.
- Conducting Research on developing large-scale vision-language foundation model.
- Used KubeFlow pipelines to run experiments and MLflow for experiment logging.
- R&D for potential applications of Large Vision-Language models for new function conception.

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

- Improved satellite image quality using Image Super-Resolution and Denoising to improve object detection, change detection, segmentation, and road sign recognition.
- Designed a solution based on state-of-the-art technologies such as Image-to-image translation, Style transfer, Denoising methods

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

- Developed an Automatic anchor optimization method for RetinaNet.
- Developed a novel algorithm “Binary Crow Search Algorithm” for Neural Architecture Search.
- Developed an algorithm to automatically freeze and un-freeze weights for transfer learning, named step-wise transfer learning.
- Developed a GAN-based solution to generate disguised face images from normal images.
- Designed a Unit-class loss to improve Heterogeneous Face Recognition by 3%.

Education

Ph.D. Computer Engineering *Sejong University, Seoul*
Doctoral degree program *2017 – 2022*
Thesis: A study on Minimizing Human Effort by Improving Data, Design, and Process Automation for Deep Learning

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.
- **Mobeen Ahmad**, Usman Cheema, Muhammad Abdullah, Seungbin Moon, and Dongil Han. Generating synthetic disguised faces with cycle-consistency loss and an automated filtering algorithm. **Mathematics**, 10(1):4, 2021.
- **Mobeen Ahmad**, Muhammad Abdullah, and Dongil Han. Small object detection in aerial imagery using retinanet with anchor optimization. In 2020 International conference on electronics, information, and communication (**ICEIC**), pages 1–3. IEEE, 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.
- Muhammad Abdullah, **Mobeen Ahmad**, and Dongil Han. Facial expression recognition in videos: An cnn-lstm based model for video classification. In 2020 International Conference on Electronics, Information, and Communication (**ICEIC**), pages 1–3. IEEE, 2020.

Technical skills

Programming Languages	Python, C/C++
Machine Learning	PyTorch, Transformers, Lightning, DeepSpeed