AHMAD MOBEEN

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Career Interests

Image-to-Image translation, Image Super-Resolution, and Denoising, Deep learning, Neural Architecture Search, Algorithms, AutoML, Object detection, Image processing, Heterogeneous face recognition, Small-object detection.

Education

Ph.D. in Computer Engineering   2017 – July 2022(expected)
Sejong University, Seoul, South Korea
Concentrations: Artificial Intelligence, Computer Vision, Machine Learning

MS in Robotics and Intelligent Machine Engineering   2014 – 2016
National University of Science and Technology, Islamabad, PK
Concentrations: Artificial Intelligence, Computer Vision, Machine Learning, Serial & Parallel Robots

BS in Electrical & Computer Engineering   2009 - 2013
COMSATS University of Science and Technology, Lahore, PK
Concentrations: Embedded Systems, Operating Systems, Computer Architecture

Experience

- **Deep Learning Engineer** at Dabeeo Inc.   2020 – 2021
  - Improved satellite image quality using <u>Image Super-Resolution and Denoising</u>
    - Led to improved results for object detection, change detection, segmentation, and road sign recognition.
  - Designed a solution based on state-of-the-art technologies
    - Image-to-image translation, Style transfer, Denoising methods

- **Research Assistant** at Vision and Image Processing Lab, Sejong University   2017 - Present
  - Developed a GAN-based solution to generate disguised face images from normal images.
  - Developed an algorithm to automatically freeze and un-freeze weights for transfer learning.
  - Designed a Unit-class loss to improve Heterogeneous Face Recognition by 3%.
  - Developed an Automatic anchor optimization method for RetinaNet.
  - Developed a novel algorithm "Binary Crow Search Algorithm" for Neural Architecture Search.

- **Teaching Assistant** at National University of Science and Technology, Pakistan   2015 – 2016
  - Assisted my supervisor for the course "Electrical engineering".
  - Prepared lectures and course material.
  - Evaluated quizzes and exams and conducted extra classes.

Patents

- CycleGAN 및 IoU 손실을 활용한 이미지 생성 방법 및 장치 (Image Generation Method and Apparatus Using CycleGAN and IoU loss)- (pending)
- 단계적 전이 학습 기반 합성곱 신경망을 활용한 분류 방법 및 장치 (Classification Method and Apparatus Using CNN with Stepwise Transfer Learning) – (pending)
- 까마귀 탐색 알고리즘에 기반한 인공 신경망 구조의 자동 설계 방법 및 장치 (출원 예정) {METHOD AND APPARATUS FOR AUTOMATIC DESIGN OF ARTIFICIAL NEURAL NETWORK STRUCTURE BASED ON CROW SEARCH ALGORITHM} - 10-2020-0135247

Selected Publications

- **M. Ahmad**, U. Cheema, M. Abdullah, S. Moon, and D. Han, "Generating Synthetic Disguise Face Database using Cycle-Consistency Loss and Automatic Filtering Algorithm", in *Mathematics.* 2022, *10*, 4. https://doi.org/10.3390/math10010004.

- **M. Ahmad**, M. Abdullah, H. Moon, and D. Han, "Plant Disease Detection in Imbalanced Datasets Using Efficient Convolutional Neural Networks with Stepwise Transfer Learning," in *IEEE Access*, vol. 9, pp. 140565-140580, 2021, doi: 10.1109/ACCESS.2021.3119655.

- **M. Ahmad**, M. Abdullah, H. Moon, S. J. Yoo, and D. Han, "Image Classification Based on Automatic Neural Architecture Search using Binary Crow Search Algorithm," in *IEEE Access*, doi: 10.1109/ACCESS.2020.3031599.

- U. Cheema, **M. Ahmad**, Dongil Han, Seungbin Moon, "Heterogeneous Visible-Thermal and Visible-Infrared Face Recognition Using Cross-Modality Discriminator Network and Unit-Class Loss", Computational Intelligence and Neuroscience, vol. 2022, Article ID 4623368, 15 pages, 2022. https://doi.org/10.1155/2022/4623368.

- **M. Ahmad**, M. Abdullah, and D. Han, "Video Quality Enhancement using Generative Adversarial Networks-based Super-Resolution and Noise Removal", in *2021 36th International Technical Conference on Circuits/Systems, Computers and Communications (ITC-CSCC)*, Jeju, Korea, 2021.

- M. Abdullah, **M. Ahmad**, and D. Han, "Hierarchical Attention Approach in Multimodal Emotion Recognition for Human Robot Interaction" in *2021 36th International Technical Conference on Circuits/Systems, Computers and Communications (ITC-CSCC)*, Jeju, Korea, 2021.

- **M. Ahmad**, M. Abdullah, and D. Han, "Small Object Detection in Aerial Imagery using RetinaNet with Anchor Optimization," *2020 International Conference on Electronics, Information, and Communication (ICEIC)*, Barcelona, Spain, 2020, pp. 1-3, doi: 10.1109/ICEIC49074.2020.9051269.

- **M. Ahmad**, J. Joe, and D. Han, "CortexNet: Convolutional Neural Network with Visual Cortex in human brain," *2018 IEEE International Conference on Consumer Electronics - Asia (ICCE-Asia),* Jeju, 2018, pp. 206-212, doi: 10.1109/ICCE-ASIA.2018.8552151.

Core Skills

Python, Jupyter Notebooks, TensorFlow, Keras, PyTorch, scikit, OpenCV, PIL, Dlib, RabbitMQ