

Moktari Mostofa

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Education

West Virginia University

PH.D. CANDIDATE IN ELECTRICAL ENGINEERING

Morgantown, West Virginia

AUGUST, 2018 - Present

University of Dhaka

M.SC. IN ELECTRICAL AND ELECTRONIC ENGINEERING

Dhaka, Bangladesh

November, 2016 - September, 2018

University of Dhaka

B.SC. IN ELECTRICAL AND ELECTRONIC ENGINEERING

Dhaka, Bangladesh

January, 2012 - September, 2016

PhD Research

I am interested in the areas of Machine Learning, Computer Vision, and Deep Learning. Having an in-depth knowledge of machine learning techniques with application in image processing. Interested in devising a better problem-solving method for challenging tasks, and learning new technologies and tools if the need arises

- **PhD Advisor :** Dr. Nasser M. Nasrabadi (Professor, nasser.nasrabadi@mail.wvu.edu)
- **Committee :** Matthew Valenti, Jeremy Dawson, Omid Dehlabgi, Benjamin S. Riggan, Nasser M. Nasrabadi (Chair)

Work Experience

- **Benchmarking Video Super-Resolution Algorithm :** We have explored and implemented state-of-the-art deep video super-resolution algorithms optimized for face recognition (FR) task. In addition, we have evaluated the recognition performance of a commercial-off-the-shelf deep learning-based face matcher (i.e., FaceNet) for the hallucinated faces.
- **A Joint Cross-Modal Super-Resolution Approach For Vehicle Detection in Aerial Imagery :** We design a cross-modal & super-resolution network which jointly learns image-to-image modality transformation and super-resolution across two different domains. Then, we perform detection on these translated super-resolved images using one of the state-of-the-art detectors, You Only Look Once-version 3 (YOLO-v3) which provides significant performance gain in cross-domain case of vehicle detection.
- **Cross-Spectral Iris Matching Using Coupled cGAN (conditional GAN) :** In this work, we propose a coupled generative adversarial network (CpGAN) architecture for cross-spectral iris recognition by projecting the visible and near-infrared iris images into a low-dimensional embedding domain to explore the hidden relationship between them.
- **Face Recognition and Identity Verification :** Design a deep identity-aware face hallucination framework using Generative Adversarial Network (GAN)
- **Joint-SRVDNet: Joint Super Resolution and Vehicle Detection Network:** We have implemented a novel deep joint network to perform both super-resolution and detection simultaneously using multi-scale GAN framework which attains superior results against the state-of-the-art methods.
- **Super-Resolution for Overhead Imagery Using Generative Adversarial Learning :** We design a multi-scale Generative Adversarial network (GAN) to perform super-resolution of aerial vehicle imagery and pedestrian with a high up-scaling ratio factor
- **Aerial Vehicle Detection on Super-resolved images using YOLOV3:** We implement state-of-the-art object detection algorithm, YOLOV3 (You Only Look Once) and achieve satisfactory detection performance on super-resolved aerial images.

Skills

Programming Languages	Python, Matlab, C
Deep Learning Frameworks	Pytorch, Tensorflow, Tensorlayer
Web Development	HTML
General Softwares	Microsoft Office, LATEX

Projects

- **Face Recognition at Extreme Pitch and Yaw Angles** A novel coupled profile to the frontal PIFR model utilizing pose as an auxiliary information (i.e., pose attention) is developed. [Jan,2022-Present, CITeR project]
- **Joint Pose Estimation and Face Frontalization** We have implemented a multi-task framework which is able to simultaneously rotate the off-angle face to a frontal view and gives an estimate of the pose angle of the input probe. [June,2021-Present, CITeR project]
- **Benchmarking Video Super-Resolution Algorithm** In this project, we have investigated and benchmarked deep video super-resolution algorithms optimized for face recognition (FR), comprehensively examining the important factors in video super-resolution algorithms related to face recognition (quality, sharpness and clarity in facial features). [August.2020-May,2021 CITeR project]
- **Cross-Spectral Iris Matching Using Coupled cGAN (conditional GAN)** In this work, we have implemented a coupled generative adversarial network (CpGAN) architecture for cross-spectral iris recognition by projecting the visible and near-infrared iris images into a low-dimensional embedding domain to explore the hidden relationship between them. The framework investigates the potential capabilities of GAN based network to improve the performance of traditional cross-spectral iris recognition methods. [February.2020-Present, CITeR project]
- **End-to-End Deep Super-Resolution Face Recognition System in the wild** We have designed a novel identity-aware GAN for face super resolution which enables us to hallucinate photo-realistic high-resolution (HR) faces while preserving the face identity. We combine the discriminator and face verifier by proposing a single network which performs both tasks simultaneously. Our discriminator jointly learns to distinguish face images at multiple scales. This unified multiscale structure enables the discriminator to transfer information between generated face images of different scales. [August. 2019-Present, CITeR project]
- **Joint-SRVDNet: Joint Super Resolution and Vehicle Detection Network** We have designed a framework which implements super-resolution of low-resolution image and perform detection task on these super-resolved images simultaneously. The experimental results show that our proposed framework achieves better visual quality than the state-of-the-art methods for aerial super-resolution with 4x up-scaling factor and improves the accuracy of aerial vehicle detection. [May. 2019-July.2019]
- **Super Resolution-Assisted Deep Aerial Vehicle Detection** Our proposed system can be represented as a combination of two deep sub-networks. The first sub-network aims to use a GAN architecture for getting super resolved images. It ensures recovery of photo-realistic images from down-sampled images. The second sub-network consists of a deep neural network (DNN)-based object detector for detecting vehicles in super resolved images. In our architecture, the Single Shot Multi Box Detector (SSD) is used for vehicle detection. [November. 2018-April. 2019]

Publications

JOURNAL & CONFERENCES

- Moktari Mostofa, Mohammad Saeed Ebrahimi Saadabadi, Sahar Rahimi Malakshan, Nasser M. Nasrabadi, **“Pose-Attention Guided Profile to Frontal Face Recognition**, Submitted to IEEE International Joint Conference on Biometrics (Accepted at July 19, IJCB 2022)
- Mohammad Saeed Ebrahimi Saadabadi, Sahar Rahimi Malakshan, Sobhan Solaymani, Moktari Mostofa, Nasser M. Nasrabadi, **“Information Maximization for Extreme Pose Face Recognition**, Submitted to IEEE International Joint Conference on Biometrics (Accepted at July 19, IJCB 2022)
- Sahar Rahimi Malakshan, Mohammad Saeed Ebrahimi Saadabadi, Sobhan Solaymani, Moktari Mostofa, Nasser M. Nasrabadi, **“Joint Super-Resolution and Head Pose Estimation for Extremely Low Resolution faces**, Submitted to IEEE International Joint Conference on Biometrics (IJCB 2022)
- Moktari Mostofa, Salman Mohamadi, Jeremy Dawson, Nasser M. Nasrabadi, **“Deep GAN-Based Cross-Spectral Cross-Resolution Iris Recognition”**, IEEE transactions on biometrics, behavior, and identity science (T-BIOM), Accepted July 26, 2021.
- Moktari Mostofa, Syeda Nyma Ferdous, Benjamin S. Riggan, Nasser M. Nasrabadi, **“Joint-SRVDNet: Joint Super Resolution and Vehicle Detection Network”**, IEEE Access, May 3, 2020. (Accepted and published)
- Moktari Mostofa, Syeda Nyma Ferdous, Nasser M. Nasrabadi, **“A Joint Cross-Modal Super-Resolution Approach For Vehicle Detection in Aerial Imagery”**, SPIE Conference on Defence and Commercial 2020. (Accepted)
- Moktari Mostofa, Fariborz Taherkhani, Nasser M. Nasrabadi, **“Cross-Spectral Iris Matching Using Coupled cGAN”**, IEEE International Joint Conference on Biometrics (IJCB 2020). (Accepted and published)
- Syeda Nyma Ferdous, Moktari Mostofa, N. M. Nasrabadi, **“Super Resolution-Assisted Deep Aerial Vehicle Detection”**, SPIE Conference on Defence and Commercial 2019.(Accepted and published)

Academic Services

- Reviewer in IEEE Access, The Multidisciplinary Open Access Journal

- Reviewer in Scientific Reports, The Springer Natural