Md Abul Hayat

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Education

University of Arkansas, Fayetteville, AR — Expected: August 2022
PhD student of Electrical Engineering
Courses: Deep Learning, Machine Learning, Information Theory, Statistical Inference, Computational Statistics, Time Series.

Bangladesh University of Engineering & Technology (BUET), Dhaka, Bangladesh — September 2015
Bachelor of Science in Electrical & Electronic Engineering
Courses: Digital Signal Processing I & II, Microwave Engineering, Digital Communication, Power System Analysis.

Technical Skills

Programming Languages: Python, R, MATLAB, C++/C, AMPL
Machine Learning Modules: PyTorch, Keras, TensorFlow, NumPy, Pandas, scikit-learn, Jupyter
Engineering Applications: Simulink, PowerWorld, PSpice, Tableau, LaTeX
Other Skills: Git, Bash, Linux, High Performance Computing

Work Experience

University of Arkansas, Fayetteville, AR — August 2017 - Present
Graduate Assistant, Electrical Engineering

- Analysis of Peripheral venous pressure (PVP) signals under different clinical conditions using statistical and deep learning.
- Developed a Kalman filter and hidden Markov model based unsupervised anomaly detection algorithm for PVP signals.
- Applied deep learning techniques like CNN, Grad-CAM and Guided Backpropagation on PVP signals to identify discriminatory behaviors.
- Developed a Gaussian mixture model (GMM) based Bayesian unsupervised algorithm for rice panicle detection.
- Developing U-Net based supervised image segmentation model for rice panicle detection.
- Applied classical dimension reduction techniques like PCA, Kernel-PCA; regression techniques like GLM, LASSO, Ridge and classification algorithms like k-means, KNN, DBSCAN, OPTICS, SVM in MATLAB and Python.

Nokia Bell Labs, Murray Hill, NJ — June 2019 - August 2019
Summer Intern – Math & Algorithms, Human Augmented Sensing Group

- Applied deep learning techniques on Optical Coherence Tomography (OCT) images of skin.
- Mentors: Atefeh Mohajeri, William Sean Kennedy

Grameenphone, Dhaka, Bangladesh — October 2015 - August 2017
System Engineer, Regional Operations Department

- Grameenphone, part of the Norwegian Telenor Group, is the largest telecommunications operator in Bangladesh.
- Worked with more than 400 BTS/nodeBs of Huawei. Planned and implemented diversity techniques. Analyzed possible issues of MPD degradation and TCH congestion.
- Implemented different radio aggregation techniques on wireless backhaul devices like NEC iPasolink, Huawei Optix RTN900 and SIAE ALCplus2. Analyzed and solved performance issues like IPPM loss and Ping Packet loss.

Publications

[J4] M. A. Hayat, Jingxian Wu, et.al., "Unsupervised Anomaly Detection in Peripheral Venous Pressure Signals with Hidden Markov Models," Biomedical Signal Processing & Control. **[Under Review, IF: 3.321]**
[J3] M. A. Hayat, Jingxian Wu, et.al., "Unsupervised Bayesian Learning for Rice Panicle Segmentation with UAV Images," Plant Methods. **[Accepted, IF: 4.460]**
[J2] P. Bonasso, K. Sexton, **M. A. Hayat**, et. al., "Venous Physiology Predicts Dehydration in the Pediatric Population," Journal of Surgical Research, June 2019. **[IF: 2.187]**
[J1] P. Bonasso, K. Sexton, S. Mehl, M. Golinko, **M. A. Hayat**, et. al., "Lessons learned measuring peripheral venous pressure waveforms in an anesthetized pediatric population," Biomedical Physics & Engineering Express, April 2019.
[C2] S. M. Hasan, **M. A. Hayat** and M. F. Hossain, "On the downlink SINR and outage probability of stochastic geometry based LTE cellular networks with multi-class services," 18th International Conference on Computer and Information Technology (ICCIT), Dhaka, 2015.
[C1] S. M. Hasan, M. B. Monjil, F. Mohsin, **M. A. Hayat** and A. B. M. H. Rashid, "Adaptive beamforming with a Microphone Array," 18th International Conference on Computer and Information Technology (ICCIT), Dhaka, 2015.