Hafiz Imtiaz

Contact Information

Associate Professor
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Research Interests

Machine learning, differential privacy, neuroimaging, source separation, distributed matrix & tensor factorization, dimension reduction, feature learning, computer vision, pattern recognition, signal/image processing.

Education

Rutgers, the State University of New Jersey, New Brunswick, NJ 08901-8554

Ph.D., Electrical and Computer Engineering, May 2020

- Cumulative GPA: 4.00 / 4.00
- Adviser: Prof. Anand D. Sarwate
- Area of research: machine learning, differential privacy, matrix and tensor decomposition, fMRI image analysis
- Relevant courses: Digital Signals and Filters, Stochastic Signals and Systems, Convex Optimization, Detection and Estimation Theory, Information Theory and Coding, Biometrics, Image Coding and Processing, Machine Learning (Coursera), Neural Networks and Deep Learning (Coursera), Convolutional Neural Networks (Coursera).

M.Sc., Electrical and Computer Engineering, October 2017

- Cumulative GPA: 4.00 / 4.00
- Topic: *Empirical Comparison of Differentially-Private Principal Component Analysis Algorithms*
- Adviser: Prof. Anand D. Sarwate
- Area of research: machine learning, differential privacy, matrix decomposition

Bangladesh University of Engineering and Technology, Dhaka-1000, Bangladesh

M.Sc., Electrical and Electronic Engineering, July 2011

- Cumulative GPA: 3.92 / 4.00
- Thesis title: *A Spectral Domain Dominant Feature Extraction Algorithm for Face and Palm-print Recognition*
- Adviser: Prof. Shaikh A. Fattah
- Area of Research: image processing - face and palm-print based human identification
- Relevant courses: Biomedical Signal Processing, Advanced Digital Signal Processing, Broadband Wireless Communication, Digital Speech Processing.

B.Sc., Electrical and Electronic Engineering, March 2009

- Cumulative GPA: 3.97 / 4.00
- Thesis title: *Show-through Cancellation in Duplex Printed Documents*
- Adviser: Prof. Md. Kamrul Hasan
- Area of Research: image processing - adaptive filtering based show-through cancellation
- Relevant courses: Digital Communication, Telecommunication Engineering, Microwave Engineering, Digital Signal Processing I & II, Random Signals and Processes, Microprocessor and Interfacing, Control System, Computer Programming (C and C++).

Work Experience

Bangladesh University of Engineering and Technology, Dhaka, Bangladesh

Associate Professor, Department of EEE **February 2021 to present**

- Courses taught: Energy Conversion I, Energy Conversion II, Continuous Time Signals and Linear Systems
- Research works: i) machine learning; ii) differential privacy; iii) distributed optimization

Rutgers University, New Jersey

Graduate Student, Department of ECE **September 2014 to June 2020**

- Ph.D. research in progress: development of algorithms for the collaborative neuroimaging data analysis tool `COINSTAC`, development of a Python package `dp-stats` (includes commonly used differentially-private machine learning and statistical algorithms), development of algorithms for differentially-private orthogonal tensor decomposition, canonical correlation analysis, distributed ICA, non-negative matrix factorization and distributed NMF (codes hosted on Gitlab).

Part-time Lecturer, Department of ECE **June 2015 to July 2015**

- Course taught: Introduction to Computers for Engineers (14:440:127), Summer 2015

Teaching Assistant, Department of ECE **September 2014 to June 2015**

- Course taught: Introduction to Computers for Engineers (14:440:127), Fall/Spring 2014

Bangladesh University of Engineering and Technology, Dhaka, Bangladesh

Assistant Professor, Department of EEE **December 2011 to August 2014**

- Courses taught: Electronics-II, Continuous Time Signals and Linear Systems
- Research works: i) Power quality classification - spectral feature extraction for classification of power quality disturbance; ii) Action recognition - feature extraction from video sequences employing RANSAC, OpticalFlow, etc.

Lecturer, Department of EEE **April 2009 to December 2011**

- Courses taught: Microwave Engineering Laboratory, Measurement and Instrumentation Laboratory, Digital Signal Processing Laboratory, Communication Laboratory, Digital Electronics Laboratory, Electronic Circuit Simulation Laboratory
- Research works: Face and palm-print based human identification - feature extraction from spectral and wavelet domains for efficient face/palm-print recognition.

Military Institute of Science and Technology (MIST), Dhaka, Bangladesh

Part-time Lecturer, Department of EECE **June 2010 to August 2014**

- Courses taught: Microwave Engineering, Microprocessor and Interfacing Laboratory, VLSI-I Laboratory, Digital Signal Processing Laboratory

Awards

Rutgers, the State University of New Jersey

- ECE Graduate Program Academic Achievement Award, 2020
- ECE PhD Research Excellence Award, Spring 2019
- Rutgers PreDoctoral Leadership Development Academy Fellow 2019-2020
- Rutgers School of Graduate Studies Conference Travel Award 2018
- TA/GA Professional Development Fund Award 2018
- TA/GA Professional Development Fund Award 2017
- ECE PhD Research Excellence Award, Spring 2016
- ICASSP 2016 NSF Grant for US-based Students, March 2016.
- TA/GA Professional Development Fund Award 2016.

Hardware and Software Skills

Computer Software Related Skills:

- Programming languages: Expert: Matlab, Python; Basic: Java, C, SLURM, 8086 Assembly, QBASIC.
- Deep learning: TensorFlow and Keras.
- Computer vision software: OpenCV.
- Machine learning: matrix factorization, regression, support vector machine, clustering, gradient descent using `Scikit-Learn`, `cvx`, etc.
- Simulation: Expert: OrCAD PSpice; Basic: Microwind and DSCH.
- Regular use of Microsoft Office and TEX (LATEX, BIBTEX).
- Basic drawing and imaging: Adobe Photoshop, Illustrator, AutoCAD, SolidWorks and Microsoft Visio.
- Operating systems: Mac OSX, Windows, Linux (Ubuntu and openSUSE).
- System implementation using ATMega16 microcontroller.
- Basic experience in Android app development.