Resume – K. M. Naimul Hassan

Personal Information

Personal website | Email | Google Scholar | GitHub | LinkedIn

Research Interests

■ Applied Machine Learning/Deep Learning ■ Audio Informatics ■ Healthcare ■ Signal Processing ■ Ubiquitous Computing ■ Conversational AI

Education

Bangladesh University of Engineering and Technology (BUET)

M.Sc. in Electrical and Electronic Engineering (EEE) *July 2021-Present*
Expected to be completed before August 2023
Major in Communication & Signal Processing

B.Sc. in Electrical and Electronic Engineering (EEE) *February 2016-February 2021*
Major in Communication & Signal Processing

Relevant Coursework

Deep Learning, Machine Learning and Pattern Recognition, Biomedical Signal Processing, Advanced Multimedia Communication, Digital Signal Processing, Random Signal Processing, Digital Image Processing, Microprocessors and Embedded Systems, Control Systems, Probability and Statistics.

Professional Experience

Department of EEE, BUET

Graduate Fellow *December 2021-Present*
Research Assistant *July 2021-November 2021*

Publications

International Conference Proceedings

■ **K. M. N. Hassan** and M. A. Haque, "SS+CEDNet : A Speech Privacy Aware Cough Detection Pipeline by Separating Sources," 2022 IEEE 10th Region 10 Humanitarian Technology Conference (R10-HTC), 2022, pp. 32-37, doi : 10.1109/R10-HTC54060.2022.9929794.
Repository Paper

■ **K. M. N. Hassan** et al., "ALSNet : A Dilated 1-D CNN for Identifying ALS from Raw EMG Signal," ICASSP 2022 - 2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2022, pp. 1181-1185, doi : 10.1109/ICASSP43922.2022.9747366.
Repository Paper

■ **K. M. N. Hassan**, S. Biswas and M. F. Uddin, "Electrical Power Consumption Profile Modelling of Air Conditioner for Smart Grid Load Management," 2020 11th International Conference on Electrical and Computer Engineering (ICECE), 2020, pp. 178-181, doi : 10.1109/ICECE51571.2020.9393101.
Repository Paper

■ **K. M. N. Hassan**, S. K. Biswas, M. S. Anwar, M. S. Iman Siam and C. Shahnaz, "A Dual-Purpose Refreshable Braille Display Based on Real Time Object Detection and Optical Character Recognition," 2019 IEEE International Conference on Signal Processing, Information, Communication & Systems (SPICSCON), 2019, pp. 78-81, doi : 10.1109/SPICSCON48833.2019.9065110.
Repository Paper

■ A. B. A. Qayyum, A. Anika, M. M. M. Miah, M. M. Rahman, **K. M. N. Hassan** et al., "Direction of Arrival Estimation through Noise Suppression : A Novel Approach using GSC Beamforming and Room Acoustic Simulation," 2019 IEEE International Conference on Signal Processing, Information, Communication & Systems (SPICSCON), 2019, pp. 104-108, doi : 10.1109/SPICSCON48833.2019.9065151.
Paper

Journal Publications

■ **K. M. N. Hassan**, S. Biswas and M. F. Uddin, "Peak Load Reduction in Smart Grid by a Hybrid Algorithm for ON-OFF Scheduling of Large Scale Air Conditioning System," Sustainable Energy, Grids and Networks. *(Submitted).*

■ M. F. Uddin, **K. M. N. Hassan** and S. Biswas, "Peak load minimization in smart grid by optimal coordinated ONOFF scheduling of air conditioning compressors," Sustainable Energy, Grids and Networks, Volume 28, 2021, 100545, ISSN 2352-4677, https://doi.org/10.1016/j.segan.2021.100545.
Repository Paper

■ A. B. A. Qayyum, **K. M. N. Hassan**, A. Anika et al., "DOANet : a deep dilated convolutional neural network approach for search and rescue with drone-embedded sound source localization," J AUDIO SPEECH MUSIC PROC. 2020, 16 (2020). https://doi.org/10.1186/s13636-020-00184-2
Repository Paper

Awards/Honors

Recipient, Post-graduate fellowship (M.Sc.), 2021-Present
For outstanding research profile
Department of EEE, BUET

Second runner-up, IEEE Signal Processing (SP) Cup, 2020
Final at IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) 2020, Barcelona, Spain
Competition overview magazine

First runner-up, IEEE Video and Image Processing (VIP) Cup, 2019
Final at IEEE International Conference on Image Processing (ICIP) 2019, Taipei, Taiwan
Competition overview magazine

Champion in Bangladesh section & world finalist, Innovation Challenge, IEEE YESIST12, 2019
Final at Stamford University, Hua Hin, Thailand

Global rank-10^{th}, IEEE Signal Processing (SP) Cup, 2019

Champion, Inter University Poster Presentation, Esonance, 2017
Islamic University of Technology (IUT)

Selected Projects

Detection and classification of sound events in medical environments
Working on the efficient detection and classification of audio events in medical environments.

Synthetic Speech Attribution
Developing DNNs for detecting algorithms used to generate synthetic speech.

Intelligent dialog management of social-bots
Working primarily as a dialog architect for developing an intelligent dialog manager for open domain social-bots.

Identifying Amyotrophic Lateral Sclerosis (ALS) from raw EMG Signal
Developed a 1-D dilated CNN for identifying ALS from raw EMG Signal. A project for the Biomedical Signals, Instrumentation and Measurement course.

Search & Rescue with Drone-Embedded Sound Source Localization
Developed DNNs to predict the azimuth and elevation of sound source captured by the microphone array embedded with a drone. This project was also part of the efforts in the IEEE SP Cup 2019.

Activity recognition from body cameras
Research conducted for the IEEE VIP cup 2019- implemented a privacy aware office activity recognition model from the first-person-view video data.

Refreshable braille display based on real time object detection and optical character recognition
A dual purpose refreshable braille display- an object detection model and an OCR engine is integrated with the hardware prototype. This project was part of the Communication Systems course and the Innovation Challenge, IEEE YESIST12 2019.

Unsupervised abnormality detection by using intelligent and heterogeneous autonomous systems
Research project for the IEEE SP Cup 2020- developed an LSTM autoencoder and a convolutional autoencoder for detecting anomality from sensor and video surveillance data respectively.

Real-time English (British) sign language to Bengali sign language translation system
Modeled a CNN for translating British sign language digits to that of Bengali sign language ; part of the Digital Signal Processing course.

Technical Strengths

Operating Systems : MacOS, Windows, Linux.
Languages : C, C++, Python, MATLAB, AMPL, Octave, 8086 Assembly, Verilog, HTML.
Document Preparation : LaTeX.
ML Frameworks & Libraries : PyTorch, Keras, Tensorflow, Numpy, Pandas, Scikit-learn.
Version Control : GitHub, GitLab.
Circuit Simulation and Design : Proteus, PSpice, Quartus, Tina-TI.

Volunteer Works

Vice-Chairperson, IEEE Signal Processing Society BUET SB Chapter, 2019-2021
Member, IEEE Signal Processing Society, 2017-Present
Student Member, IEEE, 2017-Present