Resume – K. M. Naimul Hassan

Personal Information

K. M. Naimul Hassan
Dhaka, Bangladesh
Personal website
Google Scholar Profile
LinkedIn profile
GitHub profile
Email

Research Interests

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

Education

M.Sc. in Electrical & Electronic Engineering (EEE) *July 2021-Present*

- Expected to be completed before June 2023
- Major in Communication & Signal Processing
- Noteworthy courses : Deep Learning, Machine Learning and Pattern Recognition, Biomedical Signal Processing, Advanced Multimedia Communication, Brain-Computer Interface
- Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

B.Sc. in Electrical & Electronic Engineering (EEE) *February 2016-February 2021*

- Major in Communication & Signal Processing
- Noteworthy courses : Digital Signal Processing, Random Signal Processing, Communication Systems, Digital Image Processing, Biomedical Signals, Instrumentation and Measurement, Linear Algebra
- Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

Experience

Graduate Fellow *December 2021-Present*
Department of Electrical & Electronic Engineering (EEE), Bangladesh University of Engineering and Technology (BUET)

Research Assistant (RA) *July 2021-November 2021*
Department of Electrical & Electronic Engineering (EEE), Bangladesh University of Engineering and Technology (BUET)

Publications

International Conference Proceedings

- **Hassan, K. M. N.** and Haque, M.A., "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
- **Hassan, K. M. N.** 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
- **Hassan, K. M. N.**, Biswas, S.K. and Uddin, M. F., "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
- **Hassan, K. M. N.**, Anwar, M.S., Siam, M.S.I. and Shahnaz, C., 2019, November. A Dual-Purpose Refreshable Braille Display Based on Real Time Object Detection and Optical Character Recognition. In 2019 IEEE International Conference on Signal Processing, Information, Communication & Systems (SPICSCON) (pp. 78-81). IEEE.
  Repository Paper

- Qayyum, A.B.A.A., Anika, A., Miah, M.M.M., Rahman, M.M., **Hasan, K. M. N.**, Islam, M.T., Shouborno, S.A.I., Shadiq, M.F. and Haque, M.A., 2019, November. Direction of Arrival Estimation through Noise Suppression : A Novel Approach using GSC Beamforming and Room Acoustic Simulation. In 2019 IEEE International Conference on Signal Processing, Information, Communication & Systems (SPICSCON) (pp. 104-108). IEEE.
  Paper

Journal Publications

- **Hassan, K. M. N.**, Biswas, S.K. and Uddin, M. F., "Peak Load Reduction in Smart Grid by a Hybrid Algorithm for ON-OFF Scheduling of Large Scale Air Conditioning System", Elsevier Sustainable Energy, Grids and Networks. *(Submitted)*.
- Uddin, M. F., **Hassan, K. M. N.**, and Biswas, S.K., "Peak load minimization in smart grid by optimal coordinated ONOFF scheduling of air conditioning compressors." Sustainable Energy, Grids and Networks 28 (2021) : 100545.
  Repository Paper
- Qayyum, A.B.A., **Hassan, K. M. N.**, Anika, A., Shadiq, M.F., Rahman, M.M., Islam, M.T., Imran, S.A., Hossain, S. and Haque, M.A., 2020. DOANet : a deep dilated convolutional neural network approach for search and rescue with drone-embedded sound source localization. EURASIP Journal on Audio, Speech, and Music Processing, 2020(1), pp.1-18.
  Repository Paper

Awards/Honors

- **Recipient**, Post-graduate fellowship (M.Sc.), 2021-Present
  Department of Electrical and Electronic Engineering (EEE), Bangladesh University of Engineering and Technology (BUET)
- **Second Runner-up**, IEEE Signal Processing (SP) Cup, 2020
  Unsupervised abnormality detection by using intelligent and heterogeneous autonomous systems
  Final at the 45^{th} 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
  Activity Recognition from Body Cameras
  Final at the 26^{th} IEEE International Conference on Image Processing (ICIP) 2019, Taipei, Taiwan
  Competition Overview Magazine
- **Champion in Bangladesh Section & World Finalist**, Innovation Challenge, IEEE YESIST12, 2019
  Project- Third Eye : A braille display based on real time object detection
  Final at Stamford University, Hua Hin, Thailand
- 10^{th} **in the World Ranking**, IEEE Signal Processing (SP) Cup, 2019
  Search & rescue with drone-embedded sound source localization
- **Champion**, Inter University Poster Presentation, Esonance, 2017
  Project name : PowerGym
  Islamic University of Technology(IUT)

Projects

Ongoing Projects

- **Detection and classification of sound events in medical environment**
  Working on developing deep learning models for audio event detection specifically in medical environment (such as : cough, sneeze, sniffle etc.). This includes collecting a large scale audio dataset too.
- **Intelligent Dialog Management of SocialBot**
  Part of the research for the on-going 5th edition of Alexa SocialBot Grand Challenge. Working primarily as a dialog architect.
- **Synthetic Speech Attribution**
  Developing deep neural networks for detecting algorithms used to generate synthetic speech.

Notable Earlier Projects

- **Identifying Amyotrophic Lateral Sclerosis (ALS) from raw EMG Signal**
  Developed a 1-D dilated convolutional neural network for identifying ALS from raw EMG Signal.

- **Search & Rescue with Drone-Embedded Sound Source Localization**
  Developed deep neural network architectures 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 Signal Processing (SP) Cup 2019- achieved the 10th postion globally.
- **Activity Recognition from Body Cameras**
  Research conducted for the IEEE Video and Image Processing (VIP) cup 2019- developed a privacy aware office activity recognition model from the first-person-view video data. Achieved first runner-up position in the competition.
- **Refreshable Braille Display Based on Real Time Object Detection and Optical Character Recognition**
  Developed a dual purpose refreshable braille display- an object detection model and an OCR engine is integrated with the hardware prototype. This project achieved the winner position and world finalist in the Innovation Challenge, IEEE YESIST12 2019.
- **Unsupervised abnormality detection by using intelligent and heterogeneous autonomous systems**
  Research project for the IEEE Signal Processing (SP) Cup 2020- developed an LSTM autoencoder and convolutional autoencoder for detecting anomality from sensor and video surveillance data respectively. Secured second runner-up position in the competition.
- **Peak load minimization of air conditioners connected to a Smart Grid (SG)**
  Developed a hybrid and a heuristic algorithm in order to minimize the peak power consumption of air conditioning system connected to a Smart Grid.
- **Electrical Power Consumption Profile Modelling of Air Conditioner for Smart Grid Load Management**
  Developed a mathematical electrical power consumption profile model consisting of on-time, off-time, energy consumption etc. for air conditioning system connected to a Smart Grid.
- **Real Time English (British) Sign Language to Bengali Sign Language Translation System**
  Developed a deep neural network for translating British sign language digits to that of Bengali sign language.

Technical Strengths

Operating systems : MacOS, Windows, Linux.

Programming languages : C, C++, Python, MATLAB, AMPL, Octave, HTML.

Office softwares : Microsoft Office, LaTeX.

Deep Learning API & platforms : PyTorch, Keras, Tensorflow, Kaggle, Google Colab.

Version Control Systems : GitHub, GitLab.

Circuit Simulators : Proteus.

Languages : Bengali, English.

Professional Organizations

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

References

- **Dr. Mohammad Ariful Haque**, Professor
  Department of EEE, BUET
  arifulhoque@eee.buet.ac.bd
- **Dr. Md. Forkan Uddin**, Professor
  Department of EEE, BUET
  mforkanuddin@eee.buet.ac.bd
- **Dr. Celia Shahnaz**, Professor
  Department of EEE, BUET
  celia@eee.buet.ac.bd