

PERSONAL
INFORMATION

K. M. Naimul Hassan
Dhaka, Bangladesh
 [Personal website](#)
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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 10th IEEE R-10 Humanitarian Technology Conference (R-10 HTC). (*Accepted*).
 [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 ON&OFF scheduling of air conditioning compressors." Sustainable Energy, Grids and Networks 28 (2021) : 100545.

 [Repository](#)  [Paper](#)

- Qayyum, A.B.A.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 45th 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 26th IEEE International Conference on Image Processing (ICIP) 2019, Taipei, Taiwan
[Competition Overview Magazine](#)
- **Champion in Bangladesh Section & World Finalist**, Innovation Challenge, IEEE YESSIST12, 2019
Project- Third Eye : A braille display based on real time object detection
Final at Stamford University, Hua Hin, Thailand
- **10th 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, snuffle 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 position 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 anomaly 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
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- **Dr. Md. Forkan Uddin**, Professor
Department of EEE, BUET
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- **Dr. Celia Shahnaz**, Professor
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