

Computer science Ph.D. student doing research on machine learning and deep network architectures on speech applications. Experienced in working on speech recognition, natural language processing (NLP), computer vision along around 4 years of experience in the software industry, and academia.

EMPLOYMENT

- Indiana University, Bloomington, IN**, *Research Assistant, Lab ASPIRE* Fall 2016 - Present
- Researched noise cancellation techniques to filter out wide-range of noises from human speech using noise masking approach by applying deep neural network models. (Matlab, Python, and DNN, RNN, LSTM, GAN)
 - Formulated prediction models to detect gestational preeclampsia and gestational hyper-tension among nulliparous pregnant women. (Python, Random forest, DNN)
 - Investigated human emotion detection techniques in speech using deep neural models. (CNN, RNN)
- BOSE Corporation, Boston, MA**, *Machine Learning/Neural Signal Processing Intern* Summer 2020
- Researched on speech enhancement and speech separation problem to deploy better sound quality to hearing aid and voice-assistive wearable devices. (Python, TensorFlow)
- REVE Systems, Dhaka, Jr.** *Software Engineer, Team Media Gateway* January 2015
- Programmed media gateway controller to facilitate both calls and faxes between the telephone network and VoIP network or another telephone network. Also designed front-end panel for VoIP administrators and customers for easy use. (Backend: protocol megaco 1.0, java; front-end: .jsp framework, JavaScript, Ajax and MySQL).

PUBLICATIONS

- **Khandokar Md. Nayem**, Donald Williamson, "Monaural speech enhancement using intra-spectral recurrent layers in the magnitude and phase responses", in Proc. ICASSP 2020. ([pdf](#), [video](#))
- **Khandokar Md. Nayem**, Donald Williamson, "Incorporating Intra-Spectral Dependencies with a Recurrent Output Layer for Improved Speech Enhancement", in Proc. MLSP 2019. ([pdf](#))
- Shujon Naha, **Khandokar Md. Nayem**, Md. Lisul Islam, "RSGAN: Recurrent Stacked Generative Adversarial Network for Conditional Video Generation", poster presented at IU computer vision project showcase, 2017.

EDUCATION

- Ph.D. in Computer Science**, *researcher in machine learning on speech* May 2021 (Anticipated)
Indiana University, Bloomington, IN Advisor: [Prof. Donald S. Williamson](#)
Minor in Cognitive Science
- M.Sc. in Computer Science**, December 2019
Indiana University, Bloomington, IN
- B.Sc. in Computer Science & Engineering (CSE)**, *major artificial intelligence* July 2014
[Bangladesh University of Engineering & Technology \(BUET\)](#), Dhaka, Bangladesh

PROGRAMMING SKILLS

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|-----------------------------------|--|
| Languages | Python, C++, Matlab, C, Java, C#, R, SQL, Assembly, Shell Script, L ^A T _E X |
| Frameworks & Libraries | TensorFlow, Keras, NLTK, CImg, Cmake, Git, OpenCV, OpenGL, Android |
| Machine Learning | Regression, Clustering, Decision Tree, Ensemble Methods, Naive Bayes, SVM, HMM, GMM, DNN, Autoencoder, CNN, RNN, LSTM, CRNN, GAN |

SELECTED PROJECTS

- Recurrent Stacked Generative Adversarial Network (RSGAN) generates video clips based on a pre-condition like sentence description, action classes, or fMRI signals using a novel deep architecture. (*StackGAN, Python, TensorFlow*)
- Automatic classification of rhetorical questions with stress detection using Recurrent Neural Network (RNN) and Convolutional Recurrent Neural Network (CRNN) models. (*Python, Keras, NLTK*)
- An end-to-end speech recognition system with bidirectional recurrent neural network architecture without any frame by frame labelling. (*Connectionist Temporal Classification (CTC), CRNN, Python, Keras, NLTK*)
- Image Matching to match images that are taken from different viewpoints of the same object; detect object like car from aerial snapshot; create a panoramic image stitching multiple images. (*C++, CImg, OverFeat packages*)