Deblin Bagchi

Curriculum Vitae

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Education

2013–2019 **PhD in Computer Science and Engineering**, *The Ohio State University*, Columbus, OH, USA.

- Graduated on: December 2019
- PhD thesis title: "Transfer learning approaches for feature denoising and low-resource speech recognition"
- GPA: 3.8
- Advisor: Dr. Eric Fosler-Lussier

2009–2013 **Bachelor of Engineering (Honors)**, *Jadavpur University, Kolkata, India*.

Major: Computer Science

- Graduated on: April 2013
- Bachelor's thesis title: "Stream Cipher Design with Fast Key Scheduling and Good Randomness Properties."
- GPA: 8.73

Classroom Teaching Experience

Autumn 2019 **CSE 3521:Survey of Artificial Intelligence I: Basic Techniques**, *Dept. of Computer Science and Engineering*, The Ohio State University.

- Served as instructor of record for upper-level undergraduate course on AI concepts and methodologies.
- Developed and implemented teaching materials and assessments for 40 students. Held office hours, oversaw an undergraduate Teaching Assistant.

Research Experience

2021-Present **Speech Scientist**, *M*Modal/3M HIS group*, Pittsburgh, PA, USA.

- Solve problems in transcribing and diarizing far-field multi-speaker conversations.
- Research promising approaches to lower speech recognition error rate and speaker diarization errors in publications such as ICASSP and Interspeech.
- Discuss promising approaches with team members.
- Implement a selection of such approaches based on deep learning toolkits like Kaldi.
- Run experiments over standard data sets to validate implementation.

Manager: Dr . Monika Woszcyna

2020-2021 **Scientist I**, *AMI group, Raytheon BBN Technologies*, Cambridge, MA, USA.

- Used Convolutional neural networks (CNN) and LSTM to design semi-supervised training pipelines for low-resource speech recognition in IARPA MATERIAL project.
- Augmented LSTM-based Language models with unstructured webdata and observed gains in low-resource speech recognition.
- Trained seq2seq models in a differentially private way to prevent training data leakage of speech training data in DARPA CSL project.
- Leveraged synthesized data from tacotron-based speech synthesis using deep learning architectures.

Manager: Dr . William Hartmann

2014-2019 **Research Assistant**, *Speech and Language Technologies Lab (SLaTe), The Ohio State University*, Columbus, OH, USA.

- Developed state-of-the-art deep learning approaches for feature denoising on popular CHiME-2 and CHiME-4 datasets.
- Removed dependency of deep architectures on parallel noisy and clean data for feature denoising.
- Developed low-parameter neural networks that have improved speech recognition and speech enhancement simultaneously.
- Explored Generative Adversarial Networks (GANs) for speech denoising approaches.
- Used Conditional Random Fields for segmental speech recognition.

Advisor : Dr. Eric Fosler-Lussier

2019 **Research Intern**, *Raytheon BBN Technologies*, Cambridge, MA, USA.
Improved spoken text translation using a word-correction LSTM network for translating multi-lingual audio to English.
Mentor : Dr. William Hartmann and Dr. Rabih Zabib

2018 **Research Intern**, *Raytheon BBN Technologies*, Cambridge, MA, USA.
Developed Teacher-student learning pipeline for low-resource speech recognition.
Mentor : Dr. William Hartmann

2016 **Research Intern**, *Toyota Technological Institute*, Chicago, IL, USA.
Developed acoustic segment embeddings for segmental speech recognition
Mentor : Dr. Karen Livescu

2012 **Research Intern**, *RWTH Aachen University*, Aachen, Germany.
Parallelization of HC family stream ciphers in GPUs (CUDA expertise)

Fellowships

2013-2014 **University Fellow**, *The Ohio State University*.

Skills and tools

Python (Numpy, Pandas, Scikitlearn, Matplotlib etc.), Matlab, C/C++, CUDA, Kaldi, TensorFlow, Pytorch and HTK

Publications

2019 Peter Plantinga, **Deblin Bagchi** and Eric Fosler-Lussier. Phonetic feedback for speech enhancement with and without parallel speech data. ICASSP 2020.

2018 **Deblin Bagchi** and William Hartmann. Learning from the best: A teacher-student multilingual framework for low-resource languages. ICASSP 2019.

2018 Peter Plantinga, **Deblin Bagchi** and Eric Fosler-Lussier. An exploration of mimic architectures for residual network based spectral mapping. *SLT 2018.*

2017 **Deblin Bagchi**, Peter Plantinga, Adam Stiff and Eric Fosler-Lussier. Spectral feature mapping with mimic loss for robust speech recognition. *ICASSP 2018.*

2015 **Deblin Bagchi**, Michael I Mandel, Zhongqiu Wang, Yanzhang He, Andrew Plummer and Eric Fosler-Lussier. Combining spectral feature mapping and multi-channel model-based source separation for noise-robust automatic speech recognition. In *Proceedings of the 2015 IEEE Workshop on Automatic Speech Recognition and Understanding (ASRU)*.

2015 Kun Han, Yanzhang He, **Deblin Bagchi**, Eric Fosler-Lussier and DeLiang Wang. Deep neural network based spectral feature mapping for robust speech recognition. In *Proceedings of the Sixteenth Annual Conference of the International Speech Communication Association (INTERSPEECH) 2015.*

2012 Ayesha Khalid, **Deblin Bagchi**, Goutam Paul and Anupam Chattopadhyay. Optimized GPU implementation and performance analysis of HC series of stream ciphers. In *International Conference on Information Security and Cryptology(ICISC) 2012, 293-308*