

Debottam Dutta

📍 Champaign, IL, 61820

✉ dd24@illinois.edu 🌐 debottam-dutta7.github.io 📄 [Debottam Dutta](#)

EDUCATION

Ph.D. in Electrical and Computer Engineering

University of Illinois at Urbana Champaign

Aug, 2022-Present

M.Tech in Signal Processing

Indian Institute of Science, Bangalore

July, 2021

B.Tech in Electronics and Communication Engineering

National Institute of Technology, Silchar

May, 2018

PUBLICATIONS

- [1] **Debottam Dutta**, Debarpan Bhattacharya, Sriram Ganapathy, Amir H Poorjam, Deepak Mittal, Maneesh Singh, "Acoustic Representation Learning on Breathing and Speech Signals for COVID-19 Detection", Proc. Interspeech 2022, 2863-2867, doi: 10.21437/Interspeech.2022-10376
- [2] Neeraj Kumar Sharma, Srikanth Raj Chetupalli, Debarpan Bhattacharya, **Debottam Dutta**, Pravin Mote, Sriram Ganapathy, "The second dicova challenge: Dataset, task and baseline system for covid-19 diagnosis using acoustics," IEEE Intl. Conference on Acoustics Speech Signal Processing (ICASSP), 2022
- [3] Debarpan Bhattacharya, **Debottam Dutta**, Neeraj Kumar Sharma, Srikanth Raj Chetupalli, Pravin Mote, Sriram Ganapathy, Sahiti Nori, Sadhana Gonuguntla, Murali Alagesan "Analyzing the impact of SARS-CoV-2 variants on respiratory sound signals", Proc. Interspeech 2022, 2473-2477, doi: 10.21437/Interspeech.2022-10389
- [4] Debarpan Bhattacharya, **Debottam Dutta**, Neeraj Kumar Sharma, Srikanth Raj Chetupalli, Pravin Mote, Sriram Ganapathy, Chandrakiran C, Sahiti Nori, Suhail K K, Sadhana Gonuguntla, and Murali Alagesan "Coswara: A website application enabling COVID-19 screening by analysing respiratory sound samples and health symptoms" Proc. Interspeech 2022, 1957-1958
- [5] **Debottam Dutta**, Purvi Agrawal, and Sriram Ganapathy, "A multi-head relevance weighting framework for learning raw waveform audio representations," in 2021 IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA), 2021, pp. 191–195

PROJECTS

Svadhyaya System For The Second Diagnosing COVID-19 Using Acoustics Challenge (DiCOVA2) 2021

Sep-Oct, 2021

- Developed a deep learning based model for detecting COVID-19 from cough, breathing and speech samples.
- The developed model is an ensemble of BLSTM classifier with a relevance weighting based learnable front-end and a TDNN system.
- Our submitted systems achieved **3rd position** in both breathing and speech tracks in the [leaderboard](#).

Time Frequency Representation Learning for Audio Signals M.Tech Thesis, June, 2021

- Objective was to learn raw waveform audio representations from a learnable filter-bank which addresses the biases and limitations introduced by mel filter-bank.
- The proposed multi-head relevance weighting based front-end produced representations which elicited significant accuracy improvements over log-mel spectrograms in multiple downstream tasks.
- Experiments of parametric filter-bank learning in a self-supervised setting also showed different filter-bank profile than mel.

Interpretable Representations for Acoustic Scene Classification Jan-July, 2020

- Project for the course *Speech Information Processing* in which using a CNN-DNN framework, an interpretable gaussian filter-bank was learned from the CNN kernels for the task of three class acoustic scene classification.
- Showed that the learned filter-bank also resembles the human auditory frequency response and offers better accuracy than the usually used mel filter-bank.

Speech Enhancement using Emperical Risk Minimization Jan-June, 2020

- For the course *Time-Frequency Analysis*, implemented speech denoising in perceptual risk optimization framework, a Computationally efficient technique that does not rely on clean signal prior and requires no training.
- Estimators obtained by optimizing some perceptually relevant distortion measures provide better speech denoising performance in low SNR conditions than many popular bench mark techniques.

MEMS IMU Error Analysis for Sensor Fault Detection B.Tech Thesis, 2018

- Designed and implemented a Auto regressive and SVM based time-series data analysis and prediction model for analysis of IMU(Inertial Measurement Unit) sensor data.
- Used the developed model to predict and detect any potential fault in the sensor which is extensively used in most of the navigation devices.

ACADEMIC
HONORS &
AWARDS

AICTE-PG Scholarship

- Scholarship from All Indian Council for Technical Education for post-graduate studies.

Ishan-Uday Scholarship

- Awarded with scholarship from Ministry of Human Resource Development(MHRD) and University Grants Commission (UGC), India during the course of undergraduate study.

Ishān Bikās Scholarship

- Scholarship from govt. of India for summer research in premier institutes of India.

Ananda Ram Borooah Award:

- Award from Govt. of Assam for excellent performance in HSLC examination.

SKILLS

Programming Languages and Packages: C, C++, Python, MATLAB, L^AT_EX, SHELL Scripting, git

Frameworks: PyTorch, Tensorflow, Kaldi, ESPNET

Operating Systems: Linux, Windows

COURSES
TAKEN

Pattern Recognition and Neural Networks, Speech Information Processing, Time-Frequency Analysis, Mathematical Methods and Techniques for Signal Processing, Digital Image Processing, Advanced Deep Learning, Deep Learning for Natural Language Processing, Linear and Non-linear Optimization, Random Process, Matrix Theory

EXPERIENCES

Teaching Assistantship - Machine Learning for Signal Processing, IISc Jan-June, 2021

- Responsibilities include maintaining course logistics, doubt solving and checking assignments.

Summer Research Intern-IIT Madras

May-July, 2017

- Worked on error analysis and mathematical modelling of Inertial Measurment Unit (IMU) sensor data, using Auto-regressive models.

Summer Research Intern-IIT Guwahati

May-July, 2016

- Worked on the project of mathematical modeling and design of the radiation pattern of an LED Street Lamp to beat the performance of traditionally used High Power Sodium (HPS) Lamps.