BUBAI MAJI

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Education

PhD **Jul. 2022 - Present**

Indian Institute of Technology Kharagpur, India

Research Topic: Speech Analysis, Speech Disorder, Speech Enhancement

Supervisors: Prof. Aurobinda Routray and Prof. Rajlakshmi Guha

Master of Technology (MTech) **Jun. 2018 – Aug. 2020**

IIEST Shibpur, India CGPA: 8.33/10

Department of Electronics and Telecommunication Engineering

Bachelors' of Technology (BTech) **Jul. 2013 – Jun. 2017**

Birbhum Institute of Engineering and Technology, MAKAUT, India CGPA: 8.21/10

Department of Electronics and Communication Engineering

Research Experience

Silicon Institute of Technology Bhubaneswar, India **Sep. 2020 – Jun. 2022**

JRF, Speech Processing Laboratory

Project Title: Methods and mobile applications for interpretation of emotion in various Odia dialects

Department of Science and Technology (DST), grant no. DST/ICPS/CLUSTER/Data Science/2018/General, India

Responsibilities: Data collection, algorithm development, and building an Android app for real-time speech-emotion analysis

Publications

1. **B. Maji,** R. Guha, A. Routray, "A Systematic Review of Audio-Textual Cues for Depressive Disorder Detection: From traditional Models to LLM-based Approaches" Submitted in **IEEE Transaction on Emerging Topics in Computational Intelligence** (Under review)
2. **B. Maji,** R. Guha, A. Routray, S. Nasreen, D. Majumder, **"**Investigation of Layer-Wise Speech Representations in Self-Supervised Learning Models: A Cross-Lingual Study in Detecting Depression." In Proc. **Interspeech 2024**, 3020-3024, doi: 10.21437/Interspeech.2024-1737
3. **B. Maji,** R. Guha, A. Routray, S. Nasreen, D. Majumder, **"**Prosody Disentanglement with Self-Supervised Speech Representation for Detecting Depression" in **ICASSP 2025** - 2025 IEEE International Conference on Acoustics, Speech and Signal Processing Workshops (ICASSPW) (Accepted)
4. **B. Maji**, S. Nasreen, R. Guha, A. Routray, and D. Majumdar, "Exploring Self-Supervised Models for Depressive Disorder Detection: A Study on Speech Corpora," 2024 46th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (**EMBC**), Orlando, FL, USA, 2024, pp. 1-4, doi: 10.1109/EMBC53108.2024.10781765.
5. **B. Maji**, M. Swain, R. Guha and A. Routray, "Multimodal Emotion Recognition Based on Deep Temporal Features Using Cross-Modal Transformer and Self-Attention," **ICASSP 2023** - 2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Rhodes Island, Greece, 2023, pp. 1-5, doi: 10.1109/ICASSP49357.2023.10096937.
6. **B. Maji**, A.K. Roy, S. Nasreen, R. Guha, A. Routray, and D. Majumdar, "A Novel Technique for Detecting Depressive Disorder: A Speech Database-Based Approach," 2023 45th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (**EMBC**), Sydney, Australia, 2023, pp. 1-4, doi: 10.1109/EMBC40787.2023.10341118.
7. **B. Maji** and M. Swain, "SITB-OSED: An Odia Speech Emotion Dataset," 2022 IEEE Asia-Pacific Conference on Computer Science and Data Engineering (CSDE), Gold Coast, Australia, 2022, pp. 1-5.

8. M. Swain, **B. Maji**, M. Khan, A. E. Saddik and W. Gueaieb, "Multilevel Feature Representation for Hybrid Transformers-based Emotion Recognition," 2023 5th International Conference on Bio-engineering for Smart Technologies (BioSMART), Paris, France, 2023, pp. 1-5, doi: 10.1109/BioSMART58455.2023.10162089.
9. M. Swain, **B. Maji**, P. Kabisatpathy, and A. Routray, "A DCRNN-based ensemble classifier for speech emotion recognition in Odia language." Complex & Intelligent System, Springer, vol. 8, pp. 4237–4249, 2022.
10. M. Swain, **B. Maji,** and U. Das, "Convolutional Gated Recurrent Units (CGRU) for Emotion Recognition in Odia Language," IEEE EUROCON 2021 - 19th International Conference on Smart Technologies, 2021, pp. 269-273, Lviv, Ukraine, DOI: 10.1109/EUROCON52738.2021.9535608.

Patent

1. M. Swain and **B. Maji**., "Methods and mobile applications for interpreting emotion in various Odia dialects" Indian Patent Application No. 202331002690.

Skills

- **Programming:** Python, MATLAB, JAVA, HTML.
- **Software and framework:** Pytorch, TensorFlow, Keras, Git, Docker, Deep learning and machine learning, LLM.
- **Interests:** Emotion and rare disease recognition using audio-textual cues and fairness in speech recognition, particularly for low-resource languages.
- **Self-Evaluation:** Be good at English, mathematics and programming, and state-of-the-art papers related to speech processing and the NLP domain. I sincerely hope to put some ideas into practice further.

References

Prof. Aurobinda Routray [Ph.D. Supervisor] **Jul. 2022 - Present**
Full Professor, Department of Electrical Engineering, IIT Kharagpur, India
Email: aurobinda.routray@gmail.com

Prof. Rajlakshmi Guha [PhD. Supervisor] **Jul. 2022 - Present**
Associate Professor, Rekhi Centre of Excellence for the Science of Happiness, IIT Kharagpur, India
Email: rajg@cet.iitkgp.ac.in

Dr. Monorama Swain [Project Supervisor] **Sep. 2020 – Jun. 2022**
Post-doctoral researcher, University of Copenhagen, Denmark
Former Associate Professor, SIT Bhubaneswar, India
Email: mswain@silicon.ac.in

Dr. Rik Chattopadhyay [Master's Supervisor] **Jul. 2019 – Aug. 2020**
Assistant Professor, Department of Electronics and Telecommunication Engineering, IIEST Shibpur, India
Email: rchattopadhyay@telecom.iiests.ac.in