

# Debarpan Bhattacharya

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## RESEARCH INTERESTS

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Uncertainty estimation, Calibration, Interpretability and Explainability in AI, Multimodal LLMs.

## EDUCATION

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### Indian Institute of Science (IISc), Bangalore

PhD, Electrical Engineering, EECS

Jan 2023 –

- Cumulative GPA – **8.7/10**

### Indian Institute of Science (IISc), Bangalore

M.Tech.(Research), Electrical Engineering, EECS

Oct 2020 – Dec 2022

- Cumulative GPA – **9.12/10**

### Jadavpur University, Kolkata

B.E., Electrical Engineering

May 2016 – Jun 2020

- Cumulative GPA – **9.2/10**, Rank – **7/111**

## AWARDS AND ACHIEVEMENTS

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- **TCS Research Scholar**: One of the few in India (3 from IISc) to receive the fellowship 2024
- **Qualcomm Innovation Fellowship**: One of the 12 candidates in India to receive QIF 2023
- **Best Paper Award**: For the paper [[link](#)] at IEEE INDICON 2021 2021
- **B N Paul Memorial Silver Medal**: Academic excellence in B.E. at Jadavpur University 2020
- **ISCA travel grant**: Paper presentation in INTERSPEECH 2022 in South Korea 2022
- **Research Week with Google**: Selected for the 1 week event by Google Research 2022
- **Summer Research Fellow(SRF), Indian Academy of Science(IAS)**: 110 selected in India 2019
- **Graduate Aptitude Test in Engineering (GATE)**: Ranked 195 out of 93526 Candidates 2020

## SELECTED PUBLICATIONS

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### Journals.....

- **D. Bhattacharya**, M. Phadke, S. Ansari, S. Ganapathy. Multimodal Open-text Uncertainty Estimation for Large Language Models  
[*Under Review*] *Transactions on Machine Learning Research (TMLR)*.
- **D. Bhattacharya**, S. Mukherjee, P. Dayama. When Does In-Context Learning Detect Time Series Anomalies?  
[*Under Review*] *Transactions on Machine Learning Research (TMLR)*.
- (**IF: 13.7 (2025)**) **D. Bhattacharya**, A. Poorjam, D. Mittal, M. Singh, S. Ganapathy. Gradient-free Post-hoc Explainability Using Distillation Aided Learnable Approach. [[link](#)][[ICLR'23 submission](#)]  
*IEEE Journal of Selected Topics in Signal Processing*, 2025.
- (**5-year IF: 11.2 (2023)**) **D. Bhattacharya**, N. K. Sharma, D. Dutta, S. R. Chetupalli, P. Mote, S. Ganapathy, C. Chandrakiran, S. Nori, K. Suhail, S. Gonuguntla, M. Alagesan. Coswara: A respiratory sounds and symptoms dataset for remote screening of SARS-CoV-2 infection. [[dataset](#)][[code](#)]  
*Nature Scientific Data*, 2023.
- (**IF: 3.7 (2024)**) **D. Bhattacharya**, S. Misra, N. Pathak, A. Mukherjee. IDeA: IoT-based autonomous aerial demarcation and path planning for precision agriculture with UAVs.[[link](#)]  
*ACM Transactions on Internet of Things*, 2020.

## Conferences

- **D. Bhattacharya**, M. Phadke, S. Ganapathy. BiG-SURE - Bipartite Graph Spectral energy for Uncertainty and Reliability Estimation of LLMs  
[Under Review] in *Empirical Methods in Natural Language Processing (EMNLP 2026)*
- **D. Bhattacharya**, M. Phadke, S. Ansari, K. Kala, S. Ganapathy. Quantifying and Evaluating Continuity Properties of Multi-modal LLMs.  
[Under Review] in *Empirical Methods in Natural Language Processing (EMNLP 2026)*
- **D. Bhattacharya**, Kulkarni, A., Ganapathy, S. FESTA: Functionally Equivalent Sampling for Trust Assessment of Multimodal LLMs.  
*Findings of Empirical Methods in Natural Language Processing (EMNLP 2025)*
- **D. Bhattacharya**, Kulkarni, A., Ganapathy, S. Benchmarking and Confidence Evaluation of LALMs For Temporal Reasoning.[link]  
*INTERSPEECH 2025*
- **D. Bhattacharya**, Mukherjee, S., Kamanchi, C., Ekambaram, V., Jati, A., and Dayama, P. Towards Unbiased Evaluation of Time-series Anomaly Detector.[link]  
*ICASSP 2024 and Time Series in the Age of Large Models (TSALM), NeurIPS 2024.*
- (Oral presentation) D. Dutta, **D. Bhattacharya**, A. Poorjam, D. Mittal, M. Singh and S. Ganapathy. Acoustic Representation Learning on Breathing and Speech Signals for COVID-19 Detection.[link]  
*INTERSPEECH, 2022*
- **D. Bhattacharya**, D. Dutta, N. K. Sharma, S. R. Chetupalli, P. Mote, S. Ganapathy, C. Chandrakiran, S. Nori, K. Suhail, S. Gonuguntla, M. Alagesan. Analyzing the impact of SARS-CoV-2 variants on respiratory sound signals.[link]  
*INTERSPEECH, 2022*
- N. K. Sharma, S. R. Chetupalli, **D. Bhattacharya**, D. Dutta, P. Mote, and S. Ganapathy. The Second Dicova Challenge: Dataset and performance analysis for COVID-19 diagnosis using acoustics.[link]  
*IEEE ICASSP, 2022.*
- (Best Paper Award) **D. Bhattacharya**. Huffman Coding based ECG Processing For Compression-Distortion Tradeoff.[link]  
*IEEE India Council International Conference (INDICON), 2021.*
- P. P. Chandra, **D. Bhattacharya** B. Bhattacharyya, S. Munshi. Pulse Train Modulation And ANN Based Temperature Sensor With Semi-automatic Calibration.[link]  
*IEEE India Council International Conference (INDICON), 2021.*

## EXPERIENCE

### IBM Research Lab, Bangalore, India

Mentor: Pankaj Dayama, IBM Research Global Internship Program

May – Aug'25

- Developed an interpretable time-series anomaly detection pipeline using prior-data fitted networks.

### IBM Research Lab, Bangalore, India

Mentor: Pankaj Dayama, IBM Research Global Internship Program

May– Aug'24

- Worked on an unbiased evaluation protocol for time series anomaly detection (TSAD).

## SELECTED COURSES

Advanced Deep Learning(A+)

Advanced Image Processing(A)

Stochastic Models and Applications(A)

Digital Image Processing(A+)

Machine Learning for Signal Processing(A+)

Pattern Recognition and Neural Networks(A)

Deep Learning for Natural Language Processing(B+)

Speech Information Processing(A)