Tanuka Bhattacharjee, PhD

Bengaluru, India
9038620427 | tanuka1111@gmail.com
tanuka92.github.io
linkedin.com/in/tanukab92
Google Scholar

SUMMARY

- ❖ Researcher with **8.5 years** of total experience in **Signal Processing** and **Machine Learning**, including **6 years of PhD experience** from India's top research institute **IISc, Bangalore**.
- ❖ Experience in both industrial and academic research, with **6 granted patents** and **27 published papers** in top-tier journals and conferences.
- ❖ Seeking opportunities in **research-focused roles** to contribute to advanced R&D and innovation.

SKILLS

- Signal processing
- Feature engineering
- Machine learning
- Deep learning
- Experimental design
- Data collection and analysis
- Python, PyTorch, Keras, Matlab

EXPERIENCE

Researcher
TCS Innovation Lab

📅 *08/2025 - Present*   📍 *Bengaluru*

- Developing explainable AI solutions for cardiac health monitoring using Large Language Models (LLMs) and Kolmogorov-Arnold Networks (KANs).
- Co-authored **1 peer-reviewed conference paper**.

Teaching assistant
NPTEL

📅 *07/2022 - 04/2023*   📍 *Online*

- Courses: Pattern Recognition and Application; Deep Learning

Teaching assistant
Indian Institute of Science

📅 *08/2021 - 12/2021*   📍 *Bengaluru*

- Course: Stochastic Models and Applications

Researcher
TCS Innovation Lab

📅 *07/2017 - 07/2019*   📍 *Kolkata*

- Conducted advanced research in CTO-headed Innovation Lab, contributing to strategic R&D initiatives.
- Developed non-invasive physiological signal processing and machine learning solutions for digital health care applications.
- **Ranked 8th globally** in the **PhysioNet Challenge 2018** for sleep apnea detection.
- Contributed to innovative research and technological development resulting in **6 granted patents**.
- Authored and co-authored **8 peer-reviewed papers** presented at leading international conferences.

EDUCATION

Indian Institute of Science

📅 *08/2019 - 11/2025*   📍 *Bengaluru*

Doctor of Philosophy: Speech Signal Processing

Thesis: Characterization and Enhancement of Dysarthric Speech for Amyotrophic Lateral Sclerosis: A Source-Filter Perspective

Publications: 2 journal and 12 conference papers

CGPA: 9.4 / 10

Jadavpur University

📅 *06/2015 - 06/2017*   📍 *Kolkata*

Master of Engineering: Electronics & Tele-communication Engineering

Dissertation: Intelligent brain-inspired algorithms for the next generation robots

Publications: 1 journal and 3 conference papers

CGPA: 10 / 10

Techno India, Salt Lake

(Maulana Abul Kalam Azad University of Technology)

📅 *05/2011 - 05/2015*   📍 *Kolkata*

Bachelor in Technology: Electronics & Communication Engineering

CGPA: 9.57 / 10

PATENTS

- **T. Bhattacharjee** et al., "Heart rate driven unsupervised techniques for continuous monitoring of arousal trend of users", **U.S. Patent** 11045136, issued June 29, 2021; **European Patent** 3586746, issued March 13, 2024.
- **T. Bhattacharjee** et al., "System and method for non-apnea sleep arousal detection", **U.S. Patent** 11419542, issued August 23, 2022; **European Patent** 3637432, issued March 23, 2022.
- D. Das, **T. Bhattacharjee** et al., "System and method for classification and quantitative estimation of cognitive stress", **U.S. Patent** 10716501, issued July 21, 2020; **European Patent** 3498169, issued June 12, 2024.

ACHIEVEMENTS

- **Prime Minister Research Fellowship** for pursuing PhD
- **University topper in M.E. among all departments** at Jadavpur University – *Received Sarojini Radhakanta*

- D. Das, S. Datta, **T. Bhattacharjee** et al., "Method and system for clustering users using cognitive stress report for classifying stress levels", **U.S. Patent** 11354339, issued June 7, 2022; **European Patent** 3594854, issued December 31, 2025.
- V. Sharma, C. Bhattacharyya, **T. Bhattacharjee** et al., "Discriminating features based sepsis prediction", **U.S. Patent** 11817217, issued November 14, 2023.
- S. Kimbahune, S. Shinde, A. Pal, S. Khandelwal, **T. Bhattacharjee** et al., "Method and system for screening and monitoring of cardiac diseases", **U.S. Patent** 12274536, issued April 15, 2025; **European Patent** 3760107, issued November 5, 2025.

JOURNAL PUBLICATIONS

- **T. Bhattacharjee** et al., "Source and filter characteristics based transfer learning for dysarthria severity classification in Amyotrophic Lateral Sclerosis", accepted in **Speech Communication**, Elsevier, 2026.
- **T. Bhattacharjee** et al., "Inter-speaker acoustic differences of sustained vowels at varied dysarthria severities for Amyotrophic Lateral Sclerosis", **JASA Express Letters**, vol. 4, no. 12, 2024, pp. 125203.
- A. Sadhu, A. Konar, **T. Bhattacharjee**, and S. Das, "Synergism of Firefly algorithm and Q-learning for robot arm path planning", **Swarm and Evolutionary Computation**, Elsevier, vol. 43, 2018, pp. 50-68.

CONFERENCE PUBLICATIONS

- 5 ICASSP, 3 first author
- 5 Interspeech, 2 first author
- 5 EMBC, 2 first author
- 9 others, 3 first author

SELECTED PUBLICATION LIST

- **T. Bhattacharjee** et al., "Transfer learning to aid dysarthria severity classification for patients with Amyotrophic Lateral Sclerosis", In **Interspeech** 2023, pp. 1543-1547.
- **T. Bhattacharjee** et al., "Static and dynamic source and filter cues for classification of Amyotrophic Lateral Sclerosis patients and healthy subjects", In IEEE **ICASSP** 2023, pp. 1-5.
- **T. Bhattacharjee** et al., "Exploring the role of fricatives in classifying healthy subjects and patients with Amyotrophic Lateral Sclerosis and Parkinson's disease", In IEEE **ICASSP** 2023, pp. 1-5.
- **T. Bhattacharjee** et al., "Source and vocal tract cues for speech-based classification of patients with Parkinson's disease and healthy subjects", In **Interspeech** 2021, pp. 2961-2965.
- **T. Bhattacharjee** et al., "Effect of noise and model complexity on detection of Amyotrophic Lateral Sclerosis and Parkinson's disease using pitch and MFCC", In IEEE **ICASSP** 2021, pp. 7313-7317.
- **T. Bhattacharjee** et al., "Robust beat-to-beat interval from wearable PPG using RLS and SSA", In IEEE **EMBC** 2019, pp. 4946-4952.
- **T. Bhattacharjee** et al., "A heart rate driven Kalman filter for continuous arousal trend monitoring", In IEEE **EMBC** 2018, pp. 3572-3577.
- **T. Bhattacharjee** et al., "SleepTight: Identifying sleep arousals using inter and intra-relation of multimodal signals", In IEEE **Computing in Cardiology Conference** (CinC) 2018, vol. 45, pp. 1-4.
- **T. Bhattacharjee** et al., "A general type-2 fuzzy set induced single trial P300 detection", In **FUZZ-IEEE** 2017, pp. 1-6.
- C. Pandey, A. Choudhury, **T. Bhattacharjee**, and A. Sinha, "Correlation-weighted KAN attribution for explainable AF detection using single-lead ECG", accepted in IEEE **International Conference on Pervasive Computing and Communications Workshops** (PerCom Workshops) 2026.

Majumdar Memorial Gold Centered Silver Medal
- **Ministry of Human Resources Development (MHRD), Govt. of India, scholarship** (through **GATE**) for pursuing M.E.
- **University topper in B.Tech. in Electronics & Communication Engineering department** at Maulana Abul Kalam Azad University of Technology – *Received Gold Medal*
- **Best Outgoing Student Award 2014-15** in Techno India, Salt Lake from Cognizant
- **Qualcomm Innovation Fellowship India 2020 Finalist** for the proposal titled "A Voice Conversion Approach for Amyotrophic Lateral Sclerosis (ALS) Speech Enhancement"