

Neeraj Kumar Sharma

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Education

PhD, Electrical Communication Engineering

INDIAN INSTITUTE OF SCIENCE, BANGALORE

2018

Thesis: Information-rich Sampling of Time-varying Signals

Advisor: Prof. Thippur V. Sreenivas

MTech (Research) in Electrical Communication Engineering

INDIAN INSTITUTE OF SCIENCE, BANGALORE

2018

BTech in Instrumentation and Electronics Engineering

COLLEGE OF ENGINEERING AND TECHNOLOGY, BHUBANESWAR

2009

Academic Appointments

Assistant Professor

Guwahati, India

MEHTA FAMILY SCHOOL OF DATA SCIENCE & AI

2022–Present

INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

Associate Faculty

Guwahati, India

CENTRE FOR LINGUISTIC SCIENCE AND TECHNOLOGY

2022–Present

INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

Associate Faculty

Guwahati, India

MANEKSHAW CENTRE OF EXCELLENCE FOR NATIONAL SECURITY STUDIES AND RESEARCH

2026–Present

INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

Research Scientist

Erlangen, Germany

INTERNATIONAL AUDIO LABORATORIES, FRAUNHOFER IIS

2021–2022

MENTOR: PROF. EMANUEL A. P. HABETS

CV Raman Postdoctoral Research Fellow

Bengaluru, India

INDIAN INSTITUTE OF SCIENCE

2020–2021

MENTOR: PROF. SRIRAM GANAPATHY

BrainHub Postdoctoral Research Fellow

Pittsburgh, USA

CARNEGIE MELLON UNIVERSITY

2017–2020

MENTORS: PROFS. LORI HOLT AND BARBARA SHINN-CUNNINGHAM

Selected Publications

Area: Audio Signal Processing for Healthcare

- Debarpan Bhattacharya, **Neeraj Kumar Sharma**, et al., “Coswara: A respiratory sounds and symptoms dataset for remote screening of SARS-CoV-2 infection”, in *Nature Scientific Data*, Jun 2023 (**Journal**).

- S. R. Chetupalli, P. Krishnan, **Neeraj Kumar Sharma**, A. Muguli, R. Kumar, V. Nanda, L. M. Pinto, P. K. Ghosh, S. Ganapathy, "Multi-modal point-of-care diagnostics for COVID-19 based on acoustics and symptoms", in *IEEE Journal of Translational Engineering in Health and Medicine*, Feb 2023 (**Journal**).
- 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", in *Proc. INTERSPEECH*, September 2022, Korea.
- **Neeraj Sharma**, Srikanth Raj Chetupalli, Debarpan Bhattacharya, Debottam Dutta, Pravin Mote, Sriram Ganapathy, "The Second DiCOVA Challenge: Dataset and performance analysis for Diagnosis of COVID-19 using acoustics", *IEEE Intl. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, May 2022, Singapore.
- **Neeraj Kumar Sharma**, A. Muguli, P. Krishnan, R. Kumar, Srikanth Raj Chetupalli, Sriram Ganapathy, "Towards sound based testing of COVID-19 – Summary of the first Diagnostics of COVID-19 using Acoustics (DiCOVA) Challenge", *Elsevier Computer Speech and Language (CSL)*, Nov 2021 (**Journal**).

Area: Human-Machine Audio Processing and Perception

- S. Ray Barman, **Neeraj Kumar Sharma**, S. Mahanta, "Towards a Phonology-Informed Evaluation of Multilingual TTS", to appear in *Proc. INTERSPEECH*, 2026, Sydney, Australia.
- Nishchay Nilabh, **Neeraj Kumar Sharma**, "Breaking the Pair: Evaluating Dyadic Interaction via Speaker Switching", *IEEE Intl. Conf. on Signal Processing and Communications (SPCOM)*, July 2026, Bangalore, India.
- **Neeraj Sharma**, Unal Ege Gaznepoglu, Thomas Robotham, and Emanuel AP Habets, "Two congruent cues are better than one: Impact of ITD-ILD combinations on reaction time for sound lateralization", *Journal of the Acoustical Society of America EL (JASA EL)*, 2023 (**Journal**).
- **Neeraj Sharma**, V Krishnamohan, S Ganapathy, A Gangopadhyay, L Fink, "Acoustic and linguistic features influence talker change detection", *Journal of the Acoustical Society of America EL (JASA EL)*148, 2020 (**Journal**).
- **Neeraj Sharma**, Shobhana Ganesh, Sriram Ganapathy, Lori L. Holt, "Talker Change Detection: A comparison of human and machine performance", *Journal of Acoustic Society of America (JASA)*, 2019. **Selected as a Technical Area Pick for the year (Journal)**.
- Neeraj Sajjan, Shobhana Ganesh, **Neeraj Sharma**, Sriram Ganapathy, Neville Ryant, "Leveraging LSTM Models for Overlap Detection in Multi-Party Meetings", *IEEE Intl. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, April, 2018, Canada.
- F. K. Dick, L. L. Holt, H. Nusbaum, **Neeraj Sharma**, and B. Shinn-Cunningham, "Dimension-based Attention in Learning and Understanding Spoken Language", 40th Annual Meeting of the Cognitive Science Society, 2018, Wisconsin-Madison, USA.

Area: Speech signal analysis, manipulation, and synthesis

- A. Batra, M. Narang, **Neeraj Kumar Sharma**, P. K. Das, "Boli: A dataset for understanding stuttering experience and analyzing stuttered speech", in *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. 1–5, 2025 (**Conference**).
- S. Ray Barman, S. Mahanta, **Neeraj Kumar Sharma**, "Deciphering Assamese Vowel Harmony with Featural InfoWaveGAN", in *Proc. INTERSPEECH*, pp. 1510–1514, 2024 (**Conference**).
- Priyankoo Sarmah, Wendy Lalminghlui, and **Neeraj Kumar Sharma**, "Sounds of silence: Acoustics of Inhalation in Read Speech", in *Proc. Intl. Conf. on Speech and Computer (SPCOM)*, 2023, India.
- **Neeraj Sharma**, and T. V. Sreenivas, "Time-varying Sinusoidal Demodulation for Non-stationary Modeling of Speech", in *Elsevier Speech Communication*, 2018 (**Journal**).
- **Neeraj Sharma**, Shreepad Potadar, Srikanth Raj Chetupalli and T. V. Sreenivas, "Mel-Scale Sub-band Modelling for Perceptually Improved Time-Scale Modification of Speech and Audio Signals", in *Proc. 23rd National Conference on Communications (NCC)*, March 2017, Madras, India.
- Jitendra Dhiman, **Neeraj Sharma** and Chandra Sekhar Seelamantula, "Multicomponent 2-D AM-FM Modeling of Speech Spectrograms", in *Proc. INTERSPEECH*, Sept, 2018, India.

Area: Signal processing, sampling and reconstruction

- A. H. Dar and **Neeraj Kumar Sharma**, "Advanced Wigner Distribution and Ambiguity Function in the Quadratic-phase Fourier Transform Domain: Mathematical Foundations and Practical Applications", in *Journal of Mathematical Analysis and Applications*, vol. 552, no. 1, Art. 129786, 2025 (**Journal**).
- **Neeraj Sharma**, and T. V. Sreenivas, "Event-triggered sampling using signal extrema for instantaneous amplitude and instantaneous frequency estimation", in *Elsevier Signal Processing*, 2015(**Journal**).
- **Neeraj Sharma**, "Time-instant sampling based encoding of time-varying acoustic spectrum", *AIP Conf. Proc. of Intl. Conf. on Mechanics of Hearing*, 2015.
- **Neeraj Sharma**, Sai Gunaranjan Pelluri, T. V. Sreenivas "Moving sound source parameter estimation using a single microphone and signal extrema samples", *IEEE Intl. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, March 2015, Brisbane, Australia.
- **Neeraj Sharma** and T. V. Sreenivas, "Event-triggered sampling and reconstruction of sparse trigonometric polynomials", *IEEE Intl. Conf. on Signal Processing and Communications (SPCOM)*, July 2014, Bangalore, India.
- **Neeraj Sharma** and T. V. Sreenivas, "Sparse signal reconstruction based on non-uniform signal dependent samples", *IEEE Intl. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, March 2012, Kyoto, Japan.

Area: Imaging

- S. Kundu, M. K. Bhuyan, K. F. MacDorman, **Neeraj Kumar Sharma**, M. Bhatt, “Despeckling of Synthetic Aperture Radar Images using Linear–Angular Attention Transformer”, in *IEEE Transactions on Geoscience and Remote Sensing*, vol. 63, pp. 1–11, 2025 (**Journal**).
- M. Dandi, M. Pooja, **Neeraj Kumar Sharma**, M. Bhatt, “Photoacoustic Image Reconstruction Using a Two-Phase Approach with Lightweight LNEformer”, in *IEEE International Symposium on Medical Measurements and Applications (MeMeA)*, pp. 1–5, 2025 (**Conference**).

Dataset Releases

- **Coswara Dataset**: Open-access respiratory audio dataset containing breathing, cough and speech sound samples and COVID-19 symptoms from 2,500+ individuals. [Zenodo Repository Link]
- **Boli Dataset**: Open-access stuttered speech dataset collected from close to 100 individuals from India. [GitHub Repository Link]

Teaching (UG and PG Courses)

- **DA623**: Computing with Signals (4 offerings, Jan–May 2023–26)
- **DA321**: Multimodal Data Processing and Learning I (3 offerings, Jul–Nov 2023–26)
- **DA323**: Multimodal Data Processing and Learning II (3 offerings, Jul–Nov 2023–25)
- **DA103DSAI**: Foundations of Artificial Intelligence (Jul–Nov 2025-26)
- **DA221/DA221M**: Introduction to Artificial Intelligence (Jan–May 2023)
- **DA213/DA514**: Programming with Python (3 offerings, Jul–Nov 2023–24)
- **DA108**: Programming with Python, Coursera platform (3 offerings, Jan–Apr 2024–26)

Post-Doctoral Supervision

	<i>Institute</i>
Ongoing Aamir Hamid Dar , Time-frequency analysis and machine learning	<i>Post-Doctoral</i>
	<i>Fellow</i>

Doctoral Thesis Supervision

Ongoing Timothy Alex John , Doctoral coursework in Data Science and AI (research topic to be finalized)	
Ongoing Lammibert Sumer , Doctoral coursework in Data Science and AI (research topic to be finalized)	
Ongoing Sneha Ray Barman , Computational linguistics	<i>Co-Supervision</i>
Ongoing Ashita Batra , Speech stutter detection and stutter-type classification	<i>Co-Supervision</i>
Ongoing Prakhar Kumar Sonkar , Respiratory audio analysis for AI-based respiratory healthcare	

Master Thesis Supervision

Ongoing Satyam Kumar , Machine learning based breathing anomaly detection using a custom-designed humidity sensor	<i>Co-Supervision</i>
Jul 2025 Manikantha Dandi , Photoacoustic image reconstruction using a two-phase approach with lightweight LNEformer	<i>Co-Supervision</i>
Jul 2024 Aadarsh Navnath Thakur , Prediction of strength and deformation behavior of jointed rocks using machine learning algorithms	<i>Co-Supervision</i>

Undergraduate Thesis Supervision

Ongoing Rishab Sonthalia , Self-supervised learning for respiratory acoustics in healthcare AI	
Ongoing Ujwal Fandulal Kirsan , Deep learning methods for speech source separation	
Jul 2025 Nishchay Nilabh , Audio abstraction for diarization, summarization and conversational analysis	
Jul 2025 Aditya Suryawanshi , Modulation filtering and attention-based models for audio classification	
Jul 2024 Pratham Kulkarni , A study on neural network learning dynamics	
Jul 2024 Suhayl Mahek , Perception-informed video manipulation and augmentation with custom audio	

- Jul 2024 **Sanskar Kejriwal**, Respiratory acoustics analysis for point-of-care healthcare
- Jul 2024 **Sakhsham Kumar**, Spoken language diversity quantification: multimodal dataset creation and analysis
- Jul 2024 **Samarth Hegde**, Spoken language diversity quantification: multimodal dataset creation and analysis
- Jul 2024 **Sohum Karak**, Listening-state attention decoding in multi-talker ambient environments
- Jul 2024 **Akshaj Padmakar**, Respiratory acoustics analysis for point-of-care healthcare

Research Funding

- 2025–2028 **Early Career Research Grant (ANRF)**, Melodies of the Lungs: Leveraging AI for point-of-care respiratory healthcare through respiratory audio analysis *PI; ₹62 Lakhs*
- 2024–2026 **Core Research Grant (SERB)**, Determining normative nasalance and acoustic characteristics in low-resourced North-Eastern languages with applications to language technology and speech therapy *Co-PI; ₹30 Lakhs*

Awards and Honors

- 2026 **Young Faculty Excellence in Teaching Award**, Outstanding contributions to teaching in on-campus degree programs, IIT Guwahati
- 2025 **Teaching Excellence Award**, Excellence in teaching and commitment to the BSc (Hons.) Data Science and AI online degree program, IIT Guwahati
- 2021 **CV Raman Postdoctoral Fellowship**, For research accomplishments and future research
- 2017 **BrainHub CMU-IISc Fellowship**, Postdoctoral fellowship
- 2017 **IEEE Eta Kappa Nu Membership**, Honor Society of IEEE

Professional Service

- 2026– **Coordinator, Data Science and AI**, Technology Incubation Centre *IIT Guwahati*
- 2025– **Internship and Placement Coordinator**, BSc (Hons.) Data Science and AI Online Degree Program *IIT Guwahati*
- 2025– **Associate Member**, Signal Processing Society Data Science Initiative *IEEE*
- 2025– **Chairperson**, Indian Language Speech Processing Group *ISCA*
- 2023–25 **Program Coordinator**, BSc (Hons.) Data Science and AI Online Degree Program *IIT Guwahati*
- 2023-24 **IEEE SigPort Education Board**, Member *IEEE*
- 2021 **Coordinator, DiCOVA Challenge at INTERSPEECH Conference**, Co-organizer *ISCA*
- Ongoing **Reviewer**, IEEE TSP, IEEE SPL, Elsevier Signal Processing, Elsevier Speech Communication, JASA, ISCA INTERSPEECH, IEEE ICASSP, Nature Scientific Reports

Selected Invited Talks

- Jan 2026 **AI as an Enabler for Better Governance**, Executive Development Program on Innovating Public Services Through Design Thinking, IIT Guwahati
- Jan 2026 **From Sound to Information**, Faculty Development Program on Emerging Frontiers in Speech and Language Technologies
- Jan 2026 **Navigating Research Funding Landscapes**, Research Workshop on AI, delegates from Sherubtse College, Royal University of Bhutan, IIT Guwahati
- Dec 2025 **The Missing Semester**, AI Confluence 2025, IIT Guwahati
- Nov 2025 **The Art of Programming: What, Why, and How?**, NCERT Residential Bootcamp in Artificial Intelligence, IIT Guwahati
- Nov 2025 **AI Tools in Education**, Residential Training for Science Teachers, JNV Schools
- Sep 2025 **From Artificial Intelligence to Audio Intelligence**, Signal Processing for Machine Learning Talk Series, IIT Guwahati
- May 2025 **From Python to AI**, Teachers’ Training Programme on AI, IIT Guwahati

Dec 2024 **Design and Execution of a Research Project**, Training Session on Preparing Project Proposals, Assam Administrative Staff College

Dec 2024 **COVID-19 Screening using Respiratory Sound Analysis**, Training Session on Preparing Project Proposals, Assam Administrative Staff College

Aug 2024 **From Signals to Understanding under Machine Learning**, Research and Industrial Conclave, IIT Guwahati

Aug 2023 **Beyond the Decibels**, iBrain Lecture Series, IIT Guwahati

May 2023 **The AI Landscape**, International Day of Light, SPIE Student Chapter, IIT Guwahati

May 2023 **Intelligence, or: How We Stopped Worrying and Loved Living**, Research and Industrial Conclave, IIT Guwahati

May 2023 **AI for All**, Bootcamp, Research and Industrial Conclave, IIT Guwahati

Feb 2023 **Curious Case of Sound**, TEDx, IIT Guwahati

Jan 2023 **The COVID-19 Connection**, Assam AI Initiative

Dec 2022 **Artificial Intelligence for Healthcare using Python**, DST-STITU Sponsored Training Program, Tripura University

2021 **Language Familiarity Impacts Brain Processing of Speech**, EECS Symposium, IISc

2019 **Talker Change Detection: Humans, Machines and the Gap**, UCL, Boston University, IISc
