

PRASANTA KUMAR GHOSH

ASSOCIATE PROFESSOR

**Department of Electrical Engineering
Indian Institute of Science**

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Professional Interests

Research in human centered signal processing, engineering model and technology development with applications to education and health care.

Research Interests

- Analysis and modeling of speech production, perception and communication with applications to health-care and education
- Non-stationary signal processing methods (with applications to speech and music)
- Representation and modeling for speech synthesis, pronunciation evaluation
- Silent speech processing

Education

University of Southern California (USC), Los Angeles, USA

PhD in Signal Processing at Signal Analysis and Interpretation Laboratory (SAIL), August 2011.

(Supervisor: Prof. Shrikanth S. Narayanan)

Thesis: A computational framework for exploring the role of speech production in speech processing from a communication system perspective

Committee: Shrikanth S Narayanan (Chair), Louis Goldstein, Antonio Ortega, Keith Jenkins

CGPA - 4/4

Indian Institute of Science (IISc), Bangalore, India

M.Sc.(Engg.) in Signal Processing, July 2006.

(Supervisor: Prof. Thippur V. Sreenivas)

Thesis: Non-uniform sample based speech analysis and coding

Committee: T. V. Sreenivas, Dr. Surendra Prasad, K. V. S. Hari

CGPA - 7.5/8

Jadavpur University, Kolkata, India

B.E. in Electronics and Telecommunication Engineering, June 2003.

CGPA - 4.89/5 (2nd in the class)

Professional Experiences

Associate Professor

Dec 2019 – present

Dept. of EE, Indian Institute of Science (IISc), Bangalore, India.

Assistant Professor

Aug 2014 – Dec 2019

Dept. of EE, Indian Institute of Science (IISc), Bangalore, India.

INSPIRE Faculty Fellow

Jan 2013 – Aug 2014

Dept. of EE, Indian Institute of Science (IISc), Bangalore, India.

Researcher Oct 2011 – December 2012
IBM India Research Lab, Delhi, India.
Text analytics of Call Center Transcripts

Research Assistant Aug 2006 – July 2011
SAIL, University of Southern California (USC), Los Angeles, USA.
Speech production, processing, and modeling.

Research Intern March – July 2006
Microsoft Research India, Bangalore, India.
Speaker Identification and Audio-visual Biometric Recognition.

MHRD Scholar Jan 2004 – July 2006
ECE, Indian Institute of Science (IISc), Bangalore, India.
Non-uniform Sampling for Speech Processing

Software Engineer July – December 2003
Ushacomm India Pvt. Ltd., Kolkata, India.

Summer Intern June – July 2002
Embedded DSP Group, TATA Consultancy Services, Kolkata, India.
Worked on “*Study and Simulation of Orthogonal Frequency Division Multiplexing (OFDM)*”.

Awards and Honors

1. **Prof. Priti Shankar Teaching Award for Assistant Professor 2017** from Indian Institute of Science (IISc), Bangalore.
2. **Pratiksha Trust Young Investigator Award for 2017** from Indian Institute of Science (IISc), Bangalore.
3. **3-rd place in Signal Processing Cup, 2016 competition** organized by IEEE Signal Processing Society
4. **4-th place in Signal Processing Cup, 2015 competition** organized by IEEE Signal Processing Society
5. **SERB Start-Up Research Grant for Young Scientists in Engineering Sciences for the year 2015** from the Department of Science and Technology (DST), Govt. of India.
6. **INSPIRE Faculty Fellowship Award for the year 2012** from the Department of Science and Technology (DST), Govt. of India.
7. **Honorable mention for the best paper award for the year 2010-11** in the Ming Hsieh Department of Electrical Engineering, University of Southern California (USC).
8. **Ming Hsieh Institute (MHI) Ph.D. scholar for the year 2010-11** in the Ming Hsieh Department of Electrical Engineering, University of Southern California (USC).
9. **Center for Excellence in Teaching's Award for Excellence in Teaching in the category of Electrical Engineering for the year 2010-11 in University of Southern California (USC).**
10. **Best TA awards for the year 2007-08 and 2008-09 for graduate class in the Ming Hsieh Department of Electrical Engineering, University of Southern California (USC).**
11. **Best M.Sc. (Engg) thesis award for the year 2006-07 in the Electrical Engineering Division at IISc**; thesis title: ‘Non-uniform Sample Based Speech Analysis and Coding’.

12. *IEEE Bangalore chapter, First Prize in Mr. BRV Varadhan Post-graduate Student Paper Contest 2005*; paper title: ‘ESTL: Novel Temporal Feature and Its Application to Speech Segmentation’.
13. *Ministry of Human Resources Development (MHRD), Govt. of India, scholarship Holder 2004-06.*

Publications Journals (accepted and published):

1. D. Veerababu, R. Ashwin, and **P. K. Ghosh**, “Improving Neural Network Training using Dynamic Learning Rate Schedule for PINNs and Image Classification” accepted in Machine Learning with Applications (2025).
2. Veerababu Dharanalakota and **P. K. Ghosh**, “Prediction of acoustic field in 1-D uniform duct with varying mean flow and temperature using neural networks”, accepted in Journal of Theoretical and Computational Acoustics.
3. Veerababu Dharanalakota and **P. K. Ghosh**, “Solving 2-D Helmholtz equation in the rectangular, circular, and elliptical domains using neural networks”, accepted in Journal of Sound and Vibration.
4. Sathvik Udupa, Jesuraja Bandekar, Abhayjeet Singh, Deekshitha G, Saurabh Kumar, Sandhya Badiger, Amala Nagireddi, Roopa R, **P. K. Ghosh**, Hema A Murthy, Pranaw Kumar, Keiichi Tokuda, Mark Hasegawa-Johnson, Philipp Olbrich, “LIMMITS’24: MULTI-SPEAKER, MULTI-LINGUAL INDIC TTS WITH VOICE CLONING,” in IEEE Open Journal of Signal Processing, vol. 6, pp. 293-302, 2025, doi: 10.1109/OJSP.2025.3531782
5. Tanuka Bhattacharjee, Seena Vengalil, Yamini Belur, Nalini Atchayaram, and **P. K. Ghosh**, “Inter-speaker acoustic differences of sustained vowels at varied dysarthria severities for Amyotrophic Lateral Sclerosis”, accepted in Journal of Acoustical Society of America, 2024.
6. Veerababu Dharanalakota and **P. K. Ghosh**, “Estimation of the Acoustic Field in a Uniform Duct with Mean Flow using Neural Networks”, accepted in INTERNATIONAL JOURNAL OF ACOUSTICS AND VIBRATION (IJAV).
7. Veerababu D, **P. K. Ghosh**. Neural network based approach for solving problems in plane wave duct acoustics. Journal of Sound and Vibration. 2024 Sep 1;585:118476.
8. Singh A, Nagireddi A, Jayakumar A, Deekshitha G, Bandekar J, Roopa R, Badiger S, Udupa S, Kumar S, **P. K. Ghosh**, Murthy HA. Lightweight, Multi-speaker, Multi-lingual Indic Text-To-Speech. IEEE Open Journal of Signal Processing. 2024 Mar 25.
9. Varma A, Udupa S, Sengupta M, **P. K. Ghosh**, Thirumalai V. A machine-learning tool to identify bistable states from calcium imaging data. The Journal of Physiology. 2024 Apr;602(7):1243-71.
10. Chetupalli SR, Krishnan P, Sharma N, Muguli A, Kumar R, Nanda V, Pinto LM, **P. K. Ghosh**, Ganapathy S. Multi-modal point-of-care diagnostics for COVID-19 based on acoustics and symptoms. IEEE Journal of Translational Engineering in Health and Medicine. 2023 Mar 8;11:199-210.
11. Rao A, Yamini BK, Ketan J, Shetty AP, Pal PK, Shivashankar N, **P. K. Ghosh**. Automatic classification of healthy subjects and patients with essential vocal tremor using probabilistic source-filter model based noise robust pitch estimation. Journal of Voice. 2023 May 1;37(3):314-21.
12. Yarra C, **P. K. Ghosh**. Automatic syllable stress detection under non-parallel label and data condition. Speech Communication. 2022 Mar 1;138:80-7.

13. Srinivasan A, Singh D, Yarra C, Illa A, **P. K. Ghosh**. A robust speaking rate estimator using a CNN-BLSTM network. *Circuits, Systems, and Signal Processing*. 2021 Dec;40(12):6098-120.
14. Narayanan S, Illa A, Anand N, Sinisetty G, Narayanan K, **P. K. Ghosh**. An acoustic investigation on the effect of speaking rate on vowel space and coarticulation in Toda VCV sequences. *Sādhana*. 2021 Sep;46(3):128.
15. Mannem R, **P. K. Ghosh**. A deep neural network based correction scheme for improved air-tissue boundary prediction in real-time magnetic resonance imaging video. *Computer Speech and Language*. 2021 Mar 1;66:101160.
16. Varun Belagali, Achuth Rao M V, Pebbili Gopikishore, Rahul Krishnamurthy, and **P. K. Ghosh**, “Two step convolutional neural network for automatic glottis localization and segmentation in stroboscopic videos,” *Biomed. Opt. Express* 11, 4695-4713 (2020)
17. Achuth Rao MV and **P. K. Ghosh**, “SFNet: A Computationally Efficient Source Filter Model Based Neural Speech Synthesis”, *IEEE Signal Processing Letters*, Volume 27, July 2020, pp 1170–1174.
18. Aravind Illa and **P. K. Ghosh**, “Closed-set speaker conditioned acoustic to articulatory inversion using bi-directional long short term memory network”, *The Journal of the Acoustical Society of America*, 147, no. 2 (2020): EL171-EL176.
19. Aravind Illa and **P. K. Ghosh**, “The impact of speaking rate on acoustic-to-articulatory inversion”, *Computer Speech and Language*, January 2020, Volume 59, pages: 75-90.
20. Chiranjeevi Yarra, Supriya Nagesh, Om Deshmukh and **P. K. Ghosh**, “Noise robust speech rate estimation using SNR dependent sub-band selection and peak detection strategy”, *The Journal of the Acoustical Society of America*, 146, no. 3 (2019): 1615-1628.
21. Achuth Rao MV, Prakhar Gupta and **P. K. Ghosh**, “P- and T-wave delineation in ECG signals using parametric mixture Gaussian and dynamic programming”, *Biomedical Signal Processing and Control*, May 2019, Volume 51, pages: 328-337.
22. Anurendra Kumar, Tanaya Guha, and **P. K. Ghosh**, “Dirichlet Latent Variable Model: A Dynamic Model Based on Dirichlet Prior for Audio Processing”, *IEEE/ACM Transactions on Audio, Speech and Language Processing (TASLP)* 27, no. 5 (2019): 919-931.
23. Achuth Rao MV and **P. K. Ghosh**. “Glottal Inverse Filtering Using Probabilistic Weighted Linear Prediction.” *IEEE/ACM Transactions on Audio, Speech, and Language Processing* 27.1 (2019): 114-124.
24. Yarra, Chiranjeevi and **P. K. Ghosh**, “Automatic intonation classification for British English speech using temporal patterns in utterance-level pitch contour and perceptually motivated pitch transformation” *The Journal of the Acoustical Society of America*, 144, no. 5 (2018): EL471-EL476.
25. Yarra, Chiranjeevi, Om D. Deshmukh and **P. K. Ghosh**, “A frame selective dynamic programming approach for noise robust pitch estimation.” *The Journal of the Acoustical Society of America*, 143, no. 4 (2018): 2289-2300.
26. G. Nisha Meenakshi and **P. K. Ghosh**, “Reconstruction of Articulatory Movements During Neutral Speech From Those During Whispered Speech”, *Journal of Acoustical Society of America*, June 2018, 143 (6), page 3352-3364.
27. Achuth Rao M V and **P. K. Ghosh**, “PSFM - A Probabilistic Source Filter Model for Noise Robust Glottal Closure Instant Detection”, *IEEE/ACM Transactions on Audio, Speech and Language Processing (TASLP)* 26, no. 9 (2018): 1645-1657.

28. Kakumanu, Ratna Jyothi, Ajay Kumar Nair, Rahul Venugopal, Arun Sasidharan, **P. K. Ghosh**, John P. John, Seema Mehrotra, Ravindra Panth, and Bindu M. Kutty “Dissociating meditation proficiency and experience dependent EEG changes during traditional Vipassana meditation practice”, *Biological psychology* 135 (2018): 65-75.
29. Achuth Rao M V, Shiny Victory J, and **P. K. Ghosh**, “Effect of source filter interaction on isolated vowel-consonant-vowel perception”, *The Journal of the Acoustical Society of America* 144.2 (2018): EL95-EL99.
30. Vijitha Periyasamy, Manojit Pramanik and **P. K. Ghosh**, “Review on heart-rate estimation from photoplethysmography and accelerometer signals during physical exercise”, *Journal of the Indian Institute of Science*, 97(3), 2018, 313-324.
31. Pattem Ashok Kumar, Aravind Illa, Amber Afshan and **P. K. Ghosh**, “Optimal sensor placement in electromagnetic articulography recording for speech production study”, *Computer Speech and Language* 47 (2018): 157-174.
32. Nithin Rao Koluguri, G. Nisha Meenakshi and **P. K. Ghosh**, “Spectrogram Enhancement Using Multiple Window Savitzky-Golay (MWSG) Filter for Robust Bird Sound Detection.” *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, Volume 25, number 6, 2017, pp. 1183-1192.
33. Abhay Prasad and **P. K. Ghosh**, “Information theoretic optimal vocal tract region selection from real time magnetic resonance images for broad phonetic class recognition”, *Computer Speech and Language*, Volume 39, 2016, pp 108–128.
34. Chiranjeevi Yarra, Om D. Deshmukh, and **P. K. Ghosh**, “A mode-shape classification technique for robust speech rate estimation and syllable nuclei detection”, *Speech Communication*, Volume 78, April 2016, pp 62-71.
35. Prathosh A. P., Sujith P, Ramakrishnan A. G., and **P. K. Ghosh** , “Cumulative Impulse Strength for Epoch Extraction”, *IEEE Signal Processing Letters*, Volume 23, No 4, January 2016, pp 424–428.
36. Ming Li, Jangwon Kim, Adam Lammert, **P. K. Ghosh**, Vikram Ramanarayanan, and Shrikanth Narayanan, “Speaker verification based on the fusion of speech acoustics and inverted articulatory signals”, *Computer Speech and Language*, Volume 36, 2016, pp 196–211.
37. Navaneet K L, Pavan C Madhusudana, Pradyumna Suresha, Vijitha Periyasamy and **P. K. Ghosh**, “Multiple spectral peak tracking for heart rate monitoring from photoplethysmography signal during intensive physical exercise”, *IEEE Signal Processing Letters*, Volume 22, No 12, 2015, pp 2391–2395.
38. Nisha Meenakshi and **P. K. Ghosh**, “Robust whisper activity detection using long-term log energy variation of sub-band signal”, *IEEE Signal Processing Letters*, Volume 22, No 11, Feb 2015, pp 1859–1863.
39. Afsan A. and **P. K. Ghosh**, “Improved subject-independent acoustic-to-articulatory inversion”, *Speech Communication*, Elsevier, Volume 6, 2015, pp 1–16.
40. Shrikanth Narayanan, Asterios Toutios, Vikram Ramanarayanan, Adam Lammert, Jangwon Kim, Sungbok Lee, Krishna Nayak, Yoon-Chul Kim, Yinghu Zhu, Louis Goldstein, Dani Byrd, Erik Bresch, **P. K. Ghosh**, Athanasios Katsamanis and Michael Proctor, “Real-time magnetic resonance imaging and electromagnetic articulography database for speech production research”, *J. Acoust. Soc. Am.*, Volume 136, September 2014, pp 1307.
41. Jangwon Kim, Adam Lammert, **P. K. Ghosh**, and Shrikanth Narayanan, “Co-registration of speech production datasets from electromagnetic articulography and real-time magnetic resonance imaging”, *Journal of the Acoustical Society of America Express Letter (JASAEEL)*, Volume 135, Issue 2, 2014, pp EL115-EL121.

42. **P. K. Ghosh** and S. Narayanan, “On smoothing articulatory trajectories obtained from Gaussian mixture model based acoustic-to-articulatory inversion”, *Journal of the Acoustical Society of America Express Letter (JASAEL)*, Volume 134, Issue 2, July 2013.
43. A. Tsiartas, **P. K. Ghosh**, P. G. Georgiou and S. Narayanan, “High-quality bilingual subtitle document alignments with application to spontaneous speech translation”, *Computer Speech and Language* 27, no. 2 (2013): 572-591.
44. **P. K. Ghosh** and S. Narayanan, “Automatic Speech recognition using articulatory features from subject-independent acoustic-to-articulatory inversion”, *J. Acoust. Soc. Am. Express Letters (JASAEL)*, Volume 130, Issue 4, Sep 2011, pp EL251–EL257.
45. **P. K. Ghosh**, L. M. Goldstein, S. Narayanan, “Processing speech signal using auditory-like filterbank provides least uncertainty about articulatory gestures”, *J. Acoust. Soc. Am.*, Volume 129, Issue 6, Jun 2011, pp 4014–4022.
46. **P. K. Ghosh**, L. M. Goldstein, S. Narayanan, “Auditory-like filterbank: An optimal speech processor for efficient human speech communication”, *Springer Proc. Indian Academy of Sciences (Sadhana)*, Special Issue on Speech Processing. 36(5): 699-712, October 2011.
47. **P. K. Ghosh** and S. Narayanan, “Joint source-filter optimization for robust glottal source estimation in the presence of shimmer and jitter”, *Speech Communication*, Elsevier, Volume 53, Issue 1, Jan 2011, pp 98–109.
48. **P. K. Ghosh**, A. Tsiartas, and S. Narayanan, “Robust voice activity detection using long-term signal variability”, *IEEE Trans. Audio, Speech and Language Processing*, Volume 19, Issue 3, March 2011, pp 600–613.
49. **P. K. Ghosh** and S. Narayanan, “A generalized smoothness criterion for acoustic-to-articulatory inversion”, *J. Acoust. Soc. Am.*, Volume 128, Issue 4, Oct 2010, pp 2162–2172.
50. **P. K. Ghosh** and S. Narayanan, “Bark frequency transform using an arbitrary order allpass filter”, *IEEE Signal Processing Letters*, Volume 17, No. 6, June 2010, pp 543–546.
51. **P. K. Ghosh** and S. Narayanan, “Pitch contour stylization using an optimal piecewise polynomial approximation”, *IEEE Signal Processing Letters*, Volume 16, No. 9, September 2009, pp 810–813.
52. **P. K. Ghosh** and S. Narayanan, “Closure duration analysis of incomplete stop consonants due to stop-stop interaction”, *J. Acoust. Soc. Am. Express Letters*, Volume 126, Issue 1, July, 2009, pp. EL1–EL27.
53. **P. K. Ghosh** and T.V. Sreenivas, “Time-varying Filter Interpretation of Fourier Transform and its Variants”, *Signal Processing (Elsevier)*, Volume 86, Issue 11, November 2006, Pages 3258–3263.

Conferences (accepted and published):

1. Anagha V., Seena V., Dipti B., Keerthipriya M. S., Nalini A., **P. K. Ghosh**, and Yamini B. K. “Analysis of Lip and Jaw Range of Movement in Persons With Bulbar and Spinal ALS Using Electromagnetic Articulography.”, accepted in *Frontiers of Research in Speech and Music (FRSM)* 2025.
2. Saurabh Kumar, Abhayjeet Singh, DEEKSHITHA G, Amartyaveer, Jesuraj Bandekar, Savitha Murthy, Sumit Sharma, Sandhya Badiger, Sathvik Udupa, Amala Nagireddi, Srinivasa Raghavan K M, Rohan Saxena, Jai Nanavati, Raoul Nanavati, Janani Sridharan, Arjun Mehta, Ashish Khuraishi K S, Sai Praneeth Reddy Mora, Prashanthi Venkataramakrishnan, Gauri Date, Karthika P, and **P. K. Ghosh**, “RESPIN-S1.0 Corpus: A read speech corpus of 10000+ hours in dialects of nine Indian Languages” , accepted in

- NeurIPS Datasets and Benchmarks Track 2025.
3. S. Kumar, S. Sharma, D. G, A. Singh, Amartyaveer, S. Udupa, S. Badiger, S. Khudanpur, S. Sitaram, S. Umesh, B. Ramabhadran, B. Kingsbury, H. A. Murthy, S. S. Narayanan, H. Lakounga and **P. K. Ghosh**, “MADASR 2.0: Multi-Lingual Multi-Dialect ASR Challenge in 8 Indian Languages,” Accepted in Proc. IEEE Automatic Speech Recognition and Understanding Workshop (ASRU), 2025.
 4. Amartyaveer, Murali Kadambi, Chandra Mohan Sharma, Anupam Mondal and **P. K. Ghosh**, “Bottleneck Transformer-Based Approach for Improved Automatic STOI Score Prediction,” in Proc. ASRU. IEEE, 2025
 5. A. Jayakumar, T. Bhattacharjee, S. Vengalil, Y. Belur, N. Atchayaram, M. Keerthipriya, D. Chikktimmegowda and **P. K. Ghosh**, “Classification Between Patients with Amyotrophic Lateral Sclerosis and Healthy Individuals Using Hypernasality in Speech: A Low Complexity Approach,” Accepted in National Conference on Communications (NCC), 2025.
 6. Narendra K. C., R. Muralishankar, Sanjeev Gurugopinath and **P. K. Ghosh**, “A Correlation Profile-Based Adaptive Weighing in Mel-DCT Filter Banks for Voice Activity Detection”, Accepted in National Conference on Communications (NCC), 2025.
 7. Akanksha Singh, Veerababu Dharanalakota and **P. K. Ghosh**, “Physics-Informed Neural Networks for Predicting Acoustic Pressure Inside Ducts”, Show and Tell, ICASSP 2025.
 8. Masoud Thajudeen Tholan, Vinayaka Hegde, Chetan Sharma and **P. K. Ghosh**, “Role of the Pretraining and the Adaptation data sizes for low-resource real-time MRI video segmentation”, ICASSP 2025
 9. Amartyaveer, Saurabh Kumar, Sumit Sharma, Sathvik Udupa, Sandhya Badiger, Abhayjeet Singh, Deekshitha G, Jesuraja Bandekar, Savitha Murthy, and **P. K. Ghosh**, “Improving Dialect Identification in Indian Languages Using Multimodal Features from Dialect Informed ASR”, ICASSP 2025
 10. Veerababu Dharanalakota and **P. K. Ghosh**, “Solving 2-D Helmholtz equation in the rectangular, circular, and elliptical domains using neural networks”, accepted in Journal of Sound and Vibration.
 11. Samptur N, Bhattacharjee T, Chakravarty K A, Vengalil S, Belur Y, Nalini A, **P. K. Ghosh**. Exploring Syllable Discriminability during Diadochokinetic Task with Increasing Dysarthria Severity for Patients with Amyotrophic Lateral Sclerosis. InProc. Interspeech 2024. (pp. 4114-4118).
 12. Sharma C, Chandwanshi V, **P. K. Ghosh**. A comparative study of the impact of voiceless alveolar and palato-alveolar sibilants in English on lip aperture and protrusion during VCV production. InProc. Interspeech 2024. (pp. 3100-3104).
 13. Udupa S, Maiti S, **P. K. Ghosh**. IndicMOS: Multilingual MOS Prediction for 7 Indian languages. InProc. Interspeech 2024. (pp. 2690-2694).
 14. Udupa S, Bandekar J, Kumar S, Murthy S, Pai P, Raghavan S, Nanavati R, **P. K. Ghosh**. Adapter pre-training for improved speech recognition in unseen domains using low resource adapter tuning of self-supervised models. InProc. Interspeech 2024. (pp. 2529-2533).
 15. Bandekar J, Udupa S, **P. K. Ghosh**. Articulatory synthesis using representations learnt through phonetic label-aware contrastive loss. InProc. Interspeech 2024. (pp. 427-431).
 16. Alex Paul Kamson, Akshay V. Sawant, **P. K. Ghosh** and Satish S Jeevanavar, “Exploring wav2vec 2.0 Model for Heart Sound Analysis”, accepted in EMBC 2024.

17. Jayakumar A, Bhattacharjee T, Vengalil S, Belur Y, Atchayaram N, **P. K. Ghosh**. Low Complexity Model with Single Dimensional Feature for Speech Based Classification of Amyotrophic Lateral Sclerosis Patients and Healthy Individuals. In 2024 International Conference on Signal Processing and Communications (SPCOM) 2024 Jul 1 (pp. 1-5). IEEE.
18. Jesuraja Bandekar, Sathvik Udupa and **P. K. Ghosh**, “Discovering phoneme-specific critical articulators through a data driven approach”, accepted in ISSP 2024
19. Satyadev Badireddi, Shreya Shrikant Karkun, and **P. K. Ghosh**, “Inter-subject variation in tongue shape during vowel production in /b/V/t/ sequence: An rtMRI study using 8 vowels from 74 subjects”, accepted in ISSP 2024
20. Yadav, S., Gope, D., Maheswari, K. U., and **P. K. Ghosh**. An unsupervised segmentation of vocal breath sounds. In ICASSP 2024-2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), April 2024, (pp. 9891-9895). IEEE.
21. Kumar, C. V. T., Bhattacharjee, T., Vengalil, S., Nashi, S., Keerthipriya, M., Belur, Y., ... and **P. K. Ghosh**. Spectral Analysis of Vowels and Fricatives at Varied Levels of Dysarthria Severity for Amyotrophic Lateral Sclerosis. In ICASSP 2024-2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), April 2024. (pp. 12767-12771). IEEE.
22. Kamson, A. P., Lewis, M. C., Sunil, B. V., Jeevannavar, S. S., Sawant, A., and **P. K. Ghosh**. E2E Multi-Scale CNN with LSTM for Murmur Detection in PCG or Noise Identification. In 2023 International Conference on Electrical, Communication and Computer Engineering (ICECCE), December 2023. (pp. 1-6). IEEE.
23. Singh, A., Shah, C., Varadaraj, R., Chauhan, S., and **P. K. Ghosh**. SPIRE-SIES: A Spontaneous Indian English Speech Corpus. In 2023 26th Conference of the Oriental COCOSDA International Committee for the Co-ordination and Standardisation of Speech Databases and Assessment Techniques (O-COCOSDA), December 2023. (pp. 1-6). IEEE.
24. Udupa, S., Bandekar, J., Deekshitha, G., Kumar, S., **P. K. Ghosh**, Badiger, S., ... and Nanavati, R. Gated Multi Encoders and Multitask Objectives for Dialectal Speech Recognition in Indian Languages. In 2023 IEEE Automatic Speech Recognition and Understanding Workshop (ASRU), December 2023 (pp. 1-8). IEEE.
25. Pal, P., Jain, S., Yarra, C., **P. K. Ghosh**, and Vupalla, A. K. Study of Indian English pronunciation variabilities relative to Received Pronunciation. In International Conference on Speech and Computer, November 2023. (pp. 339-349). Cham: Springer Nature Switzerland.
26. Kaur, N., and **P. K. Ghosh**. Curriculum Learning Based Approach for Faster Convergence of TTS Model. In International Conference on Speech and Computer, November 2023. (pp. 208-221). Cham: Springer Nature Switzerland.
27. Singh, A., Jayakumar, A., Deekshitha, G., Kumar, H., Bandekar, J., Badiger, S., ... and **P. K. Ghosh**. An End-to-End TTS Model in Chhattisgarhi, a Low-Resource Indian Language. In International Conference on Speech and Computer, November 2023. (pp. 164-172). Cham: Springer Nature Switzerland.
28. Singh, A., Mehta, A. S., Ashish Khuraishi, K. S., Deekshitha, G., Date, G., Nanavati, J., ... and Raghavan, S. An ASR Corpus in Chhattisgarhi, a Low Resource Indian Language. In International Conference on Speech and Computer, November 2023. (pp. 173-181). Cham: Springer Nature Switzerland.

29. Veerababu Dharanalakota, Namra Quasim, and **P. K. Ghosh**, “Estimation of Acoustic Field in a Uniform Duct with Mean Flow using Neural Networks”, accepted for presentation at the 2024 AIAA SciTech.
30. Dharanalakota, V., and **P. K. Ghosh**. Loss-based optimizer switching to solve 1-D Helmholtz equation using neural networks. The Journal of the Acoustical Society of America, 2023, 154(4supplement), A98-A98.
31. Dharanalakota, V., Raikar, A. R., and **P. K. Ghosh**. Achieving stable convergence of neural networks for estimating acoustic field in uniform ducts. The Journal of the Acoustical Society of America, 2023, 154(4supplement), A98-A98.
32. Kumar, C. V. T., Sirigiraju, M., Vaideeswaran, R., **P. K. Ghosh**, and Yarra, C. Can the decoded text from automatic speech recognition effectively detect spoken grammar errors?. In Proc. 9th Workshop on Speech and Language Technology in Education (SLaTE) (pp. 41-45).
33. Kumar, C. V. T., Bhattacharjee, T., Belur, Y., Nalini, A., Yadav, R., and **P. K. Ghosh**. Classification of multi-class vowels and fricatives from patients having Amyotrophic Lateral Sclerosis with varied levels of dysarthria severity. In Interspeech 2023.
34. Jain, S., Pal, P., Vuppala, A., **P. K. Ghosh**, and Yarra, C. An Investigation of Indian Native Language Phonemic Influences on L2 English Pronunciations. arXiv preprint 2022, arXiv:2212.09284.
35. Belagali, V., Achuth Rao, M. V., and **P. K. Ghosh** Weakly supervised glottis segmentation in high-speed videoendoscopy using bounding box labels.
36. Solanki, M. S., Bharadwaj, A., Kylash, J., and **P. K. Ghosh** Do Vocal Breath Sounds Encode Gender Cues for Automatic Gender Classification?.
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140. Achuth Rao MV, Kausthubha NK, Shivani Yadav, Dipanjan Gope, Uma Maheswari Krishnaswamy and **P. K. Ghosh**, “Automatic Prediction of Spirometry Readings from Cough and Wheeze for Monitoring of Asthma Severity”, In Proc. 25th European Signal Processing Conference (EUSIPCO), 2017, pp. 41-45.
141. Akshay Kalkunte Suresh, Srinivasa Raghavan KM and **P. K. Ghosh**, “Phoneme state posteriorgram features for speech based automatic classification of speakers in cold and healthy condition”, Proc. Interspeech 2017, Stockholm, Sweden, 3462-3466.
142. Gaurav Fotedar and **P. K. Ghosh**, “An information theoretic analysis of the temporal synchrony between head gestures and prosodic patterns in spontaneous speech”, Proc. Interspeech 2017, Stockholm, Sweden, 157-161.
143. Girija Ramesan Karthik and **P. K. Ghosh**, “Subband selection for binaural speech source localization”, Proc. Interspeech 2017, Stockholm, Sweden, 1929-1933.
144. G. Nisha Meenakshi and **P. K. Ghosh**, “A robust Voiced/Unvoiced phoneme classification from whispered speech using the ‘color’ of whispered phonemes and Deep Neural Network”, Proc. Interspeech 2017, Stockholm, Sweden, 503-507.
145. Abhishek Narwekar and **P. K. Ghosh**, “PRAV: A Phonetically Rich Audio Visual Corpus”, Proc. Interspeech 2017, Stockholm, Sweden, 3747-3751.
146. Achuth Rao M V, Shivani Yadav and **P. K. Ghosh**, “A dual source-filter model of snore audio for snorer group classification”, Proc. Interspeech 2017, Stockholm, Sweden, 3502-3506.
147. Srinivasa Raghavan, Nisha Meenakshi, Sanjeev Kumar Mittal, Chiranjeevi Yarra, Anupam Mandal, K R Prasanna Kumar and **P. K. Ghosh**, “A Comparative Study on the Effect of Different Codecs on Speech Recognition Accuracy Using Various Acoustic Modeling Techniques”, in Proc. National Conference on Communications (NCC), Chennai, India, 2017, Page(s): 1-6.
148. Pradyumna Suresha, Supriya Nagesh, Priyadarshini Savan Roshan, Aditya Gaonkar P, Nisha Meenakshi and **P. K. Ghosh**, “A High Resolution ENF Based MultiStage Classifier for Location Forensics of Media Recordings”, in Proc. National Conference on Communications (NCC), Chennai, India, 2017, Page(s): 1-6.
149. Mekhala H S, Yamini B K, Ketan J, Pal P, Shivashankar N and **P. K. Ghosh**, “Classification of Healthy Subjects and Patients with Essential Vocal Tremor Using Empirical Mode Decomposition of High Resolution Pitch Contour”, in Proc. National Conference on Communications (NCC), Chennai, India, 2017, Page(s): 1-6.
150. Achuth Rao MV and **P. K. Ghosh**, “Pitch Prediction from Mel-Frequency Cepstral Coefficients Using Sparse Spectrum Recovery”, in Proc. National Conference on Communications (NCC), Chennai, India, 2017, Page(s): 1-6.

151. Chiranjeevi Yarra, Om D. Deshmukh, and **P. K. Ghosh**, “An automatic detection of syllable stress using sonority based prominence features for pronunciation evaluation”, in Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), New Orleans, 2017, Page(s): 5845-5849.
152. Aravind Illa, Nisha Meenakshi G, and **P. K. Ghosh**, “A comparative study of acoustic-to-articulatory inversion for neutral and whispered speech”, in Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), New Orleans, 2017, Page(s): 5075-5079.
153. Gaurav Fotedar, Aditya Gaonkar P, Saikat Chatterjee, and **P. K. Ghosh**, “Automatic recognition of social roles using long term role transitions in small group interactions”, in Proc. INTERSPEECH, 8-12 September, 2016, Pages(s): 2065-2069.
154. Nazreen P.M., A. G. Ramakrishnan, and **P. K. Ghosh**, “A class-specific speech enhancement for phoneme recognition: a dictionary learning approach”, in Proc. INTERSPEECH, 8-12 September, 2016, Pages(s): 3728-3732.
155. Aditya Gaonkar P, Bhuthesh R, Dipanjan Gope, and **P. K. Ghosh**, “Robust Real-Time Pulse Rate Estimation From Facial Video Using Sparse Spectral Peak Tracking”, in Proc. SPCOM, 12-15 June, 2016, Page(s): 1-5.
156. Abhishek Narwekar and **P. K. Ghosh**, “A Comparative Study of Articulatory Features From Facial Video and Acoustic-To-Articulatory Inversion for Phonetic Discrimination”, in Proc. SPCOM, 12-15 June, 2016, Page(s): 1-5.
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158. Amber Afshan, **P. K. Ghosh**, “Better acoustic normalization in subject independent acoustic-to-articulatory inversion: benefit to recognition”, in Proc. ICASSP, 21-25 March, 2016, Page(s): 5395-5399.
159. Abhay Prasad and **P. K. Ghosh**, “Automatic classification of eating conditions from speech using acoustic feature selection and a set of hierarchical support vector machine classifiers”, in Proc. Interspeech, Sep 6-10 2015, Page(s): 884-888.
160. Satyabrata Parida, Patten Ashok Kumar and **P. K. Ghosh**, “Estimation of the air-tissue boundaries of the vocal tract in the mid-sagittal plane from electromagnetic articulograph data”, in Proc. Interspeech, Sep 6-10, 2015, Page(s): 2147-2151. (in Finalist for the best paper award)
161. Nisha Meenakshi and **P. K. Ghosh**, “A discriminative analysis within and across voiced and unvoiced consonants in neutral and whispered speech in multiple Indian languages”, in Proc. Interspeech, Sep 6-10, 2015, Page(s): 781-785.
162. Sujith P, Prathosh A. P., Ramakrishnan A. G. and **P. K. Ghosh**, “An Error Correction Scheme for GCI Detection Algorithms using Pitch Smoothness Criterion”, in Proc. Interspeech, Sep 6-10, 2015, Page(s): 3284-3288.
163. Adria Casamitjana, Martin Sundin, **P. K. Ghosh** and Saikat Chatterjee, “Bayesian learning for time-varying linear prediction of speech”, in Proc. EUSIPCO, Aug 31- Sep 4 2015, pp 325-329.
164. A. Prasad, V. Periyasamy and **P. K. Ghosh**, “Estimation of the invariant and variant characteristics in speech articulation and its application to speaker identification”, In Proc. ICASSP 2015, Page(s): 4265-4269.
165. Nisha Meenakshi and **P. K. Ghosh**, “Automatic Gender Classification Using the Mel Frequency Cepstrum of Neutral and Whispered Speech: a Comparative Study”, In Proc. NCC 2015, Page(s): 1-6.

166. Prasad Sudhakar and **P. K. Ghosh**, “Sparse smoothing of articulatory features from Gaussian mixture model based acoustic-to-articulatory inversion: Benefit to speech recognition”, in Proc. InterSpeech 2014, Page(s): 169-173.
 167. Abhay Prasad, **P. K. Ghosh** and Shrikanth Narayanan, “Selection of optimal vocal tract regions using real-time magnetic resonance imaging for robust voice activity detection”, in Proc. InterSpeech 2014, Page(s): 1539-1543.
 168. Sujith P and **P. K. Ghosh**, “Missing samples estimation in electromagnetic articulography data using equality constrained Kalman smoother”, in Proc. InterSpeech 2014, Page(s): 716-720.
 169. Nisha Meenakshi, Chiranjeevi Yarra, B. K. Yamini and **P. K. Ghosh**, “Comparison of speech quality with and without sensors in electromagnetic articulograph AG 501 recording”, in Proc. InterSpeech 2014, Page(s): 935-939.
 170. Sujith P. and **P. K. Ghosh**, “Maximum a-posteriori estimation of missing samples with continuity constraint in electromagnetic articulography data”, in Proc. ICASSP 2014, page(s): 940-944.
 171. Abhijith Mundanad Narayanan, **P. K. Ghosh** and K. Rajgopal, “Multi-Pitch Tracking using Gaussian mixture model with time varying parameters and Grating Compression Transform”, in Proc. ICASSP 2014, page(s): 1473-1477.
 172. Prasad Sudhakar, Laurent Jacques, **P. K. Ghosh**, “A sparse smoothing approach for Gaussian mixture model based acoustic-to-articulatory inversion”, in Proc. ICASSP 2014, page(s): 3032-3036.
 173. Andreas Tsiartas, **P. K. Ghosh**, Panayiotis Georgiou, and Shrikanth S. Narayanan, “Classification of clean and noisy bilingual movie audio for speech-to-speech translation corpora design”, in Proc. ICASSP 2014, page(s): 121-125.
 174. **P. K. Ghosh** and S. Narayanan, “Information theoretic acoustic feature selection for acoustic-to-articulatory inversion”, in Proc. Interspeech, Lyon, France, 2013, page(s): 3177-3181.
 175. A. Tsiartas, T. Chaspari, N. Katsamanis, **P. K. Ghosh**, M. Li, M. V. Sebroeck, A. Potamianos and S. Narayanan, “Multi-band long-term signal variability features for robust voice activity detection”, in Proc. Interspeech, Lyon, France, 2013, page(s): 718-722.
 176. M. Li, J. Kim, **P. K. Ghosh**, V. Ramanarayanan and S. Narayanan, “Speaker verification based on fusion of acoustic and articulatory information”, in Proc. Interspeech, Lyon, France, 2013, page(s): 1614-1618.
 177. Bhuthesh R, **P. K. Ghosh**, and Dipanjan Gope, “Enhanced Pulse Rate Measurement from Facial video by Automatic Detection of Sensitive Skin Regions”, in IEEE workshop on Computational Intelligence, IIT Kanpur, July 2013.
 178. M. Li, A. Lammert, J. Kim, **P. K. Ghosh**, and S. Narayanan, “Automatic Classification of Palatal and PharyngealWall Shape Categories from Speech Acoustics and Inverted Articulatory Signals”, in Proc. Workshop on Speech Production in Automatic Speech Recognition, Interspeech, Lyon, France, 2013, page(s): 34-39.
 179. S. Iqbal, A. Verma, **P. K. Ghosh**, K. Church, and J. Marcus, “Intent Focused Summarization of Caller-Agent Conversations”, in Proc. ICASSP, Vancouver, Canada, 2013, page(s): 8352-8356.
 180. J. Kim, A. Lammert, **P. K. Ghosh**, and S. Narayanan, “Spatial and temporal alignment of multimodal human speech production data: real time imaging, flesh point tracking and audio”, in Proc. ICASSP, Vancouver, Canada, 2013, page(s): 3637-3641.
- item J. Kim, **P. K. Ghosh**, S. Lee and S. S. Narayanan, “A study of emotional information present in articulatory movements estimated using acoustic-

- to-articulatory inversion”, in Proc. APSIPA ASC 2012, page(s): 1-4.
181. V. Ramanarayanan, **P. K. Ghosh**, A. Lammert and S. Narayanan, “Exploiting speech production information for automatic speech and speaker modeling and recognition – possibilities and new opportunities”, in Proc. APSIPA ASC 2012, page(s): 1-6.
 182. **P. K. Ghosh** and S. Narayanan, “Analysis of inter-articulator correlation in acoustic-to-articulatory inversion using generalized smoothness criterion”, in Proc. Interspeech, Florence, Italy, 2011, page(s): 2685-2688.
 183. S. Narayanan, E. Bresch, **P. K. Ghosh**, L. Goldstein, A. Katsamanis, Y. Kim, A. Lammert, M. Proctor, V. Ramanarayanan, and Y. Zhu, “A Multi-modal Real-Time MRI Articulatory Corpus for Speech Research”, in Proc. Interspeech, Florence, Italy, 2011, page(s): 837-840.
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 185. A. Tsiartas, **P. K. Ghosh**, Panayiotis G. Georgiou, and S. Narayanan, “Bilingual audio-subtitle extraction using automatic segmentation of movie audio”, in Proc. ICASSP, Prague, Czech Republic, 2011, page(s): 5624-5627.
 186. **P. K. Ghosh** and S. Narayanan, “A subject-independent acoustic-to-articulatory inversion”, in Proc. ICASSP, Prague, Czech Republic, 2011, page(s): 4624-4627.
 187. **P. K. Ghosh**, Andreas Tsiartas, Panayiotis G. Georgiou, and S. Narayanan, “Robust voice activity detection in stereo recording with crosstalk”, Proc. InterSpeech, 26–30 Sep, 2010, Makuhari, Japan, page(s): 3098-3101.
 188. **P. K. Ghosh**, S. Narayanan, Pierre Divenyi, Louis Goldstein, and Elliot Saltzman, “Estimation of articulatory gesture patterns from speech acoustics”, Proc. InterSpeech, 6-10 Sep, 2009, Brighton, UK, pp 2803-2806.
 189. A. Tsiartas, **P. K. Ghosh**, and S. Narayanan, “Context-driven bilingual movie subtitle alignment”, Proc. InterSpeech, 6-10 Sep, 2009, Brighton, UK, pp 444-447.
 190. A. Tsiartas, **P. K. Ghosh**, P. Georgiou, and S. Narayanan, “Robust word boundary detection in spontaneous speech using acoustic and lexical cues”, In Proc. ICASSP, Taipei, Taiwan, Apr 2009, page(s): 4785-4788
 191. S. Ananthakrishnan, **P. K. Ghosh**, S. Narayanan, “Automatic classification of question turns in spontaneous speech using lexical and prosodic evidence”, In Proc. ICASSP, Las Vegas, Nevada, April 2008, page(s): 5005-5008
 192. **P. K. Ghosh**, A. Ortega, and S. Narayanan, “Pitch Period Estimation using Multipulse Model and Wavelet Transform”, Proc. Interspeech 2007, Page(s): 2761-2764.
 193. **P. K. Ghosh**, “Speech Segmentation using Extrema-Based Signal Track Length Measure”, ICASSP 2007, Volume 4, 15-20 April 2007 Page(s): IV-1065-IV-1068.
 194. **P. K. Ghosh** and T.V. Sreenivas, “Dynamic Programming Based Optimum Non-Uniform Samples For Speech Reconstruction and Coding”, ICASSP 2006, Volume 1, Page(s): I-I.
 195. **P. K. Ghosh** and T.V. Sreenivas, “Waveform Reconstruction from Non-uniform Samples with Application to Speech Coding”, in Proc. IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing (NSIP), Japan, May, 2005, page(s): 35.
 196. **P. K. Ghosh** and A. Konar, “Modification of the LMS Predictor to Reduce Signal Prediction Error in Linear Prediction”, International Conference on Communication, Devices and Intelligent Systems (CODIS 2004), Jan 2004,

Kolkata, India.

197. **P. K. Ghosh** and T.V. Sreenivas, “Extrema based Unwarping for Time-varying Pitch Estimation”, in 12th National Conference on Communication (NCC) 2006.
198. A. Das, M. Balwani, R. Thota, **P. K. Ghosh**, “Face Recognition from Images with High Pose Variations by Transform Vector Quantization”, ICVGIP 2006, Pages: 674–685.
199. A. Das, **P. K. Ghosh**, “Audio-Visual Biometric Recognition by Vector Quantization”, IEEE Spoken Language Technology(SLT) Workshop, Dec 2006, Page(s): 166–169.

Patents (Filed):

1. Tanuka Bhattacharjee, Shreyasi Datta, Deepan Das, Anirban Dutta Choudhury, Arpan Pal, **P. K. Ghosh**, “Heart rate driven unsupervised techniques for continuous monitoring of arousal trend of users”, filed November 14, 2018.
2. Shajith I Mohamed, Kenneth W Church, Ashish Verma, **P. K. Ghosh**, “System and method for identification of intent segment in caller-agent conversations”, filed February 28, 2013.
3. Shajith Ikbale Mohamed, **P. K. Ghosh**, Ashish Verma, Jeffrey Marcus, Kenneth Church, “A system and method for caller intent labelling of the call-center conversations” filed December 19, 2013.
4. Shantanu R. Godbole, **P. K. Ghosh**, Sachindra Joshi, Srujana Merugu, and Ashish Verma, “Labeling of data for machine learning”, filed June 5, 2014, Status: Active.

Tutorials/Talks/Posters

1. Invited talk on “RESPIN - Capturing and experimenting with dialectal variations of Indic languages” in IEEE Week celebrations at NIT Karnataka Surathkal on Oct 3, 2025
2. Invited talk on “AI Applications and Impact” in International Symposium ‘Cross Domain AI applications and impact’ at Dayanand Sagar College of Engineering, Department of Artificial Intelligence and Machine Learning, a pre-summit event for AI impact summit India 2026, 30 Aug, 2025
3. Invited talk on “Speech Quality Assessment” at SoCSE RV University, Bangalore on Aug 8, 2025
4. Invited talk on “RESPIN and VAANI: capturing and experimenting with dialectal variations of Indic languages” in IASNLP 2025, 13th IIIT’s Advanced Summer school on Natural Language Processing 13th - 28th June 2025 LTRC, IIIT Hyderabad
5. Invited talk on “Vaani: A multi-modal dataset capturing language landscape of India” in Vaani roundtable at Google, Hyderabad, April 7, 2025
6. Invited talk on “A peep into how voice assistants work” in Engineering Fair in Visvesvaraya Industrial and Technological Museum, March 20, 2025
7. Invited talk on “Vaani - a multi-modal dataset capturing language landscape of India” in an event “Evaluation and Benchmarking of AI Applications in Indian Languages” in CIIL, Mysore on March 20, 2025.
8. Invited talk on “Project Vaani - capturing language landscape of India” in an event “workshop on AI for Accessibility and Inclusion” on March 19, 2025 in IISc, Bangalore.
9. Invited talk on “Fairness and ethics in creating large-scale Indic Speech Corpora” in an event ‘AI, Ethics, and Transcultural Innovation’ on March 1, 2025.

10. Invited talk on “Challenges and Opportunities in Dysarthric Speech Processing (DySP)” in Online Short-Term Training Program (STTP) on ”Advances in Speech Technology – Opportunities and Challenges,” scheduled from February 10–15, 2025.
11. Invited talk on “Challenges and Opportunities in Dysarthric Speech Processing” at TCS Research Lab, Kolkata, May 9, 2024.
12. Invited talk on “Challenges and Opportunities in Dysarthric Speech Processing (DySP)” in the department of Information Technology, IIST, Shibpur, West Bengal, May 7, 2024.
13. Invited talk on “Challenges and Opportunities in Dysarthric Speech Processing (DySP)” in a workshop on ”Navigating the frontiers of emerging technologies in engineering” by Gopalan Skill Academy in Gopalan college of Engineering, Mar 29, 2024.
14. Invited talk on Automatic Speech Recognition: Traditional and End to End Methods at Faculty Development Program on “Advances in Acoustics, Speech and Signal Processing”, N.M.A.M. Institute of Technology, Nitte, Udupi Dist, January 13, 2024.
15. Invited talk on “Challenges and Opportunities in Dysarthric Speech Processing” at Glasgow Interactive Systems (GIST) – School of Computing Science, Glasgow University, Aug 24, 2023.
16. Invited talk on “Are sounds from asthmatic patients different from healthy individuals?” at a faculty development program related to technology development in healthcare applications in SSN College of Engineering SSN Nagar, Kalavakkam, Chennai, Mar23, 2023.
17. Invited talk on “Are sounds from asthmatic patients different from healthy individuals?” at FDP on Machine and Deep learning research opportunities in Electrical Science Industries” organized by Department of Electrical and Electronics Engineering, M S Ramaiah Institute of Technology and IQAC in association with MathWorks, Mar 17, 2023.
18. Invited talk on “Recent advancements in research using electromagnetic articulography” in a workshop on articulatory dynamics in AIISH, Mysuru, Mar 2, 2023.
19. Invited talk on “Are sounds from asthmatic patients different from healthy individuals?” a ”One-week SERB Sponsored High-End Workshop on ”Deep Learning Based Biomedical Systems: Design Challenges and Future Directions ” at Electrical Engineering Department, IIT Patna, December 18, 2022.
20. Invited talk on “Challenges and Opportunities in Dysarthric Speech Processing (DySP)” in Seasonal School on “Recent Trends in Signal, Speech and Image Processing” at TKM College of Engineering, Kollam, Dec 14, 2022.
21. Invited talk on “Dysarthric speech processing” in Online Short Term Course (STC) on “Deep Learning-Based Speech Processing Techniques for Smart Health and Education Systems-Concepts, Recent Trends and Key Challenges” at Department of Electrical Engineering, Indian Institute of Technology Patna, Bihar, Sep 21 , 2021.
22. Invited talk on “Machine Learning and Signal Processing for Dysarthria –Challenges and Opportunities” in workshop under Karyashala scheme (a SERB initiative) on “Application of Machine Learning in Audio Signal Processing” from September 5th to 11th , 2022. at IIITM Gwalior, Sep 7, 2022.
23. Invited talk on “Signal processing and artificial intelligence for dysarthric speech” at a virtual event “ IEEE SPS Winter School on Recent Advances in Artificial Intelligence for Signal Processing ”, VNR Vignana Jyothi Institute of Engineering and Technology, Hyderabad, Dec 30, 2021.

24. Invited talk on “Speech Signal Processing for Dysarthria” in course on Recent Trends in Speech Processing (Online) at IIT Dharwad, Dec 21, 2021.
25. Invited talk on “Analysis and Characterization of dysarthric speech” in national workshop on “Application of Machine Learning for Communication and Signal Processing” at EC Dept, NIT Meghalaya, 22 Nov, 2021.
26. Invited talk titled “The impact of training data design on the perf. of TTS and ASR systems”, at IEEE TEMS Indian Language Symposium, July 2021.
27. Invited talk on “Deep Learning for Automatic Speech Recognition” at the Faculty Development Program on “Artificial Intelligence and Machine Learning” organized by MVJ College of Engineering, Bangalore, Jan, 2021.
28. Invited talk on “Speech signal processing methods” at the winter school on Applied Signal Processing in IIT Gandhinagar, Dec, 2019.
29. Invited talk on “Can snore sound tell its origin?” at IEEE SPS Winter School on Biomedical Signal and Image Processing, Bangalore, India, Nov, 2019.
30. Invited talk on “The orchestra behind speech” at Speech and Hearing Research Group, Department of Computer Science, University of Sheffield, Jul, 2018.
31. Invited talk on “Obstruction site prediction from snore sound” at IISc-UCL workshop on the themes of systmes neuroscience, machine learning and artificial intelligence, co-sponsored by the UCL Global Engagement Office and the Gatsby Unit, Jul, 2018.
32. Invited talk on “Recent trends in kinematics and motion capture studies in speech production” at All India Institute of Speech and Hearing, Mysuru, Feb, 2018.
33. Invited talk on “Seeing Speech” at Second Workshop on Brain, Computation, and Learning, 2018, Indian Institute of Science, Bangalore, Jan, 2018.
34. Invited talk on “Human centered signal processing for non-invasive detection and monitoring of health parameters” at Tata Consultancy Services Limited, Kolkata, Nov, 2017.
35. Tutorial offered on “Time frequency analysis of time-varying signals” at the CEP on ‘Technologies for Data Analysis and Visualization’ at CAIR, DRDO Complex, CV Raman Nagar, Bangalore, Nov, 2017.
36. Invited talk on “Discriminative Filtering: a Non-ASR Approach to Keyword Spotting” at the 2017 Speech Signal Processing Workshop in National Tsing Hua University (NTHU), Hsinchu, Taiwan, Aug, 2017.
37. Invited talk on “Posteriorgram based techniques for spotting keywords in audio” at the department of Information Science and Engineering at Ramaiah Institute of Technology, MSR Nagar, Bangalore, Jul, 2017.
38. Tutorial offered on “Binaural localization, rendering and head related transfer function” at 12th Winter School on Audio Speech and Signal Processing 2017 at IISc, Bangalore, Jan, 2017.
39. Invited talk on “Does electromagnetic articulograph provide time varying vocal tract shape in human speech production?” at the department of computer science at Indian Institute of Technology, Madras, Jan, 2017.
40. Tutorial offered on “Time frequency analysis of time-varying signals” at the CEP on ‘Technologies for Data Analysis and Visualization’ at CAIR, DRDO Complex, CV Raman Nagar, Bangalore, Dec, 2016
41. Tutorial offered on “Speech production research – opportunities and challenges” at the International Conference on Emerging Trends in Engineering, Science and Technology, Government Engineering College Trichur, Thrissur 680009, Dec, 2015.

42. Tutorial offered on “A communication perspective to speech processing” at the winter school on Speech and Audio Processing (WiSSAP) 2015 at the Dhirubhai Ambani Institute of Information and Communication Technology, Gandhinagar, Gujarat, Jan, 2015.
43. Tutorial offered on “Speech Processing and Its Applications” at the workshop on “Digital Signal Processing and Information Processing” at Nitte Meenakshi Institute of Technology, Karnataka, August 2013.
44. International Seminar on Speech Production (ISSP), Montreal, Canada, June 2011.
45. Ratheon BBN Technologies, Cambridge, Massachusetts, USA, May 2011.
46. CSAIL, Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts, USA, May 2011.
47. IBM Watson Research Center, New York, USA, May 2011.
48. Haskins Laboratories, Yale University, New Haven, Connecticut, USA, May 2011.
49. Information Theory and Applications (ITA) Workshop, University of California, San Diego (UCSD), California, USA, Feb 2011.
50. Indian Statistical Institute (ISI), Kolkata, India, December, 2010.
51. EE Department Seminar, Indian Institute of Science (IISc), Bangalore, India, December, 2010.
52. Indian Institute of Technology, Madras (IITM), Chennai, India, December, 2010.
53. STCS Seminar, Tata Institute of Fundamental Research (TIFR), Mumbai, India, December, 2010.
54. Indian Institute of Technology, Kharagpur (IITKGP), West Bengal, India, December, 2010.
55. Acoustical Society of America (ASA) Meeting, Cancun, Mexico, November, 2010.
56. Information Theory School (ITS), University of Southern California, Los Angeles, USA, August, 2010.

Sponsored Research Projects

1. ***A communication theoretic approach to understand human speech communication system***, funded by the Department of Science and Technology (DST), Govt. of India [January 2013 - December 2017].
2. ***Synthesis of affective facial gestures for natural human-machine communication*** funded by the Department of Science and Technology (DST), Govt. of India [July 2015 - June 2018].
3. ***Real time processing of VoIP Speech for Spoken keywords*** funded by DRDO, India [September 2014 - September 2018].
4. ***An automated feedback system for degree of nativity in Indian spoken English learning*** funded by the Department of Science and Technology (DST), Govt. of India [February 2017 - February 2020].
5. ***Robot audition for source localization and separation using interaural cues*** funded by the Robert Bosch Centre for Cyber-Physical Systems at the Indian Institute of Science, Bangalore [October 2016 - July 2017]
6. ***Keyword spotting in continuous speech over VoIP channels and cellular networks*** funded by the Robert Bosch Centre for Cyber-Physical Systems at the Indian Institute of Science, Bangalore [October 2016 - July 2017]

7. *Work place monitoring of heart rate variability to detect stress* funded by the Robert Bosch Centre for Cyber-Physical Systems at the Indian Institute of Science, Bangalore [October 2017 - July 2018]
8. *Automatic evaluation of spoken English communication skill* funded by the Robert Bosch Centre for Cyber-Physical Systems at the Indian Institute of Science, Bangalore [October 2018 - July 2019]
9. *Speech-based early detection and monitoring of neuro-motor disorders* funded by the Department of Science and Technology (DST), Govt. of India [October 2017 - October 2020].
10. *Text-to-speech synthesis in Kannada* funded by the Department of Kannada and Culture [March 2018 - March 2019]
11. *Development of a prototype device incorporating voice and breath sound analysis for quantification and monitoring of asthma* funded by the DBT [April 2018 - March 2021]
12. *Development of a prototype device for the diagnosis of Obstructive Sleep Apnea using snore derived respiratory signal and pulse oximetry* funded by the DBT [April 2018 - March 2021]
13. *Natural non-native English speech synthesis* funded by the DST [March 2019 - February 2022]
14. *Characterizing spatio-temporal transformations between facial myoelectric signals and articulatory behavior during regular speech, silent speech and silent reading* funded by the Pratiksha Trust [June 2018 - May 2021]
15. *English Gyani - An intelligent assistant for tutoring English via learner-tutor interactions* funded by the DST-IMPRINT [Sep 2019 - Aug 2022]
16. *Speech based articulatory visualization tool for assessment of patients with amyotrophic lateral sclerosis (ALS)* funded by the MHRD [May 2020 - April 2023]
17. *Acoustic modeling and analysis of pulmonary system* funded by the Science and Engineering Research Board (SERB) [Jan 2023 - Dec 2025]
18. *Speech recognition in Agriculture and Finance for the poor* funded by the Bill and Melinda Gates Foundation [June 2021 - Nov 2025]
19. *Text-to-speech synthesizer in nine Indian Languages* funded by the Deutsche Gesellschaft fur Internationale Zusammenarbeit (GIZ) [July 2021 - Oct 2023]
20. *VAANI - capturing language landscape of India* funded by Google LLC [Oct 2022 - Nov 2025]
21. *Text-to-speech Synthesizer Application Indian languages* funded by the Deutsche Gesellschaft fur Internationale Zusammenarbeit (GIZ) [Oct 2024 - Feb 2026]
22. *Machine Intelligence for Cognitive communication Disorders* funded by the MHRD [Mar 2019 - Sep 2023]

Teaching Experiences

Instructor at EE, IISc

Time-Frequency Analysis (Jointly with Chandra Sekhar S) (Jan-May 2013, 2014, 2015)

Dynamics of Linear Systems (Aug-Dec 2013, 2014, 2015, 2016)

Digital Signal Processing (Jointly with Soma Biswas) (Aug-Dec 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024)

Speech Information Processing (Jointly with Sriram Ganapathy) (Jan-May 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024)

Teaching Assistant (TA), USC

Introduction to Probability and Statistics for Electrical Engineering (Fall 2006)

Probability Theory for Engineers (Spring 2007)

Random Processes in Engineering (Fall 2007 and Spring 2008)

Student Mentoring**Current PhD students**

Tanuka Bhattacharjee

Girija Ramesan Karthik

Chandra Mohan Sharma

Current MTech(Research) student

Anjali Jayakumar

Chetan Kumar

Current MTech(course) students

Vijay Kumar Ganji

Avish Vipulkumar Shah

Mohamed Rizwan

Aditya Anand Gupta

Sai Krishna Kuna

Masoud Thajudeen Tholan

Nidhi

Vishnu Vardhan

Yashwant Kumar Pattapu

Shweta Shukla

Shruti Goswami

Rajkamal Rajendra Ingle

Keyurbhai Ranjitbhai Chaudhari

Avneesh Gautam

Past students

Nisha Meenakshi (PhD 2019)

Chiranjeevi Yarra (PhD 2020)

Achuth Rao MV (PhD 2021)

Aravind Illa (PhD 2021)

Shivani Yadav (PhD 2022)

Girija Ramesan Karthik (M.Sc. (Engg) 2018)

Pavan Karjol (M.Sc. (Engg) 2018)

Mannem Renuka (MTech (Research) 2020)

Abinay Reddy (MTech (Research) 2021)

Anwasha Roy (MTech (Research) 2022)

Sujith P (M.E. 2014)

Abhijith M N (M.E. 2014)

Madhumonti Roy (M.E. 2014)

Ataur Rehman (M.E. 2015)

Samik Sadhu (M.E. 2017)

Astha Singh (M.E. 2018)

Raseena K T (M.E. 2018)

Manoj Kumar (MTech (course) 2019)

Vishay Raina (MTech (course) 2019)

Bhargava Killada Naidu (MTech (course) 2019)

Manthan Sharma (MTech (course) 2021)

Bheshaj Kumar Dewangan (MTech (course) 2021)

Kunal Sah (MTech (course) 2022)

Navneet Kaur (MTech (course) 2022)
 Abhishek (MTech (course) 2022)
 Atul Raj (MTech (course) 2022)
 Abhishek Abhishek (MTech (course) 2022)
 Prajesh Rana (MTech (course) 2022)
 Rishi Gupta (MTech (course) 2023)
 Rajesh Verma (MTech (course) 2023)
 Vignan Gummadi Kumar (MTech (course) 2023)
 Burhanuddin Kamlapur Wala (MTech (course) 2023)
 Maitri Brahmbhatt Hitendrakumar (MTech (course) 2023)
 Bhagya Lakshmi Potta (MTech (course) 2023)
 Vinay Thakar (MTech (course) 2023)
 Ayush Singh (MTech (course) 2024)
 Shivam Kumar Singh (MTech (course) 2024)
 Himanshu (MTech (course) 2024)
 Pavan Kumar J (MTech (course) 2024)
 Aman Gaurav (MTech (course) 2024)
 Barot Aditya Ashok (MTech (course) 2024)
 Sharma Neha Sudhir (MTech (course) 2024)
 Vasu Mehra (MTech (course) 2024)
 Shingala Jaydeep (MTech (course) 2024)
 Vaibhav Vishwakarma (MTech (course) 2024)
 Luhar Jaykumar (MTech (course) 2024)

Professional Activities

Organizational activity

1. Area Chair, Interspeech, Brno, Czech Republic, 2021.
2. Technical Committee Chair, ICASSP, 2021.
3. Technical Committee Chair, ICASSP, 2020.
4. Technical Program Chair, SPCOM, 2020.
5. Area Chair, Interspeech, Shanghai, China, 2020.
6. Technical Program Committee member, Area Chair, ICASSP, 2019.
7. Tutorial Chair, National Conference on Communication (NCC), 2019.
8. Technical Program Chair, Interspeech, Hyderabad, India, 2018.
9. Technical Program Committee member, IEEE TENSYP 2017.
10. Technical Program Committee member, Interspeech, Stockholm, Sweden, 2016.
11. Technical Program Committee, area chair, Interspeech, San Fransisco, USA, 2016.
12. Tutorial Chair, International Conf. on Signal Processing and Communication (SPCOM), June, 2016.
13. Technical Program committee member, 2nd International Conference on "Perception and Machine Intelligence (PerMIn'15)", 26-27 February, 2015.
14. Publication Chair, The ninth Indian Conference on Computer Vision, Graphics, and Image Processing (ICVGIP2014), 14-17 December, 2014.
15. Publication Chair, International Conf. on Signal Processing and Communication (SPCOM), 22-25 July, 2014.
16. Session Chair, Speech Signal Processing, International Conference on Signal Processing and Communications (SPCOM), 22-25 July, 2014.
17. Technical Program committee member, International Conf. on Signal Processing and Communication (SPCOM), 22-25 July, 2014.

18. Session Chair, Fourth Electrical Sciences Divisional Symposium, Indian Institute of Science, February 20-21, 2014.
19. Secretary, IEEE Signal Processing Society, Bangalore Chapter (2014 onwards).
20. Session Chair, IEEE CONECCT 2014 (2014 IEEE Conference on Electronics, Computing, and Communication Technologies), 6-7 January, 2014.
21. Technical Program committee member, International Conf. on Signal Processing and Communication (SPCOM), 22-25 July, 2012.

Editorial activity

1. Associate editor of Computer, Speech and Language, Elsevier.

Reviewing activity

Journals

1. IEEE Trans. Audio, Speech, and Language Processing (TASLP)
2. IEEE Trans. Multimedia (TM)
3. IEEE Signal Processing Letters (SPL)
4. IEEE Transactions on Neural Systems and Rehabilitation Engineering (TNSRE)
5. IEEE Transactions on Instrumentation and Measurement
6. Journal of the Acoustical Society of America (JASA)
7. Computer Speech and Language (CSL)
8. Speech Communication, Elsevier
9. Signal Processing, Elsevier
10. Circuits, Systems, and Signal Processing, Springer
11. Neurocomputing, Elsevier
12. EURASIP Journal on Audio, Speech, and Music Processing
13. International Journal of Speech-Language Pathology
14. Sadhana (Journal of the Indian Academy of Sciences)
15. ISA Transactions, ELSEVIER

Conferences

1. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)
2. Conference of the Internal Speech Communication Association (INTERSPEECH)
3. International Conference on Signal Processing and Communications (SPCOM)
4. National Conference on Communications (NCC)
5. IEEE Conference on Electronics, Computing, and Communication Technologies (IEEE-CONNECT).

Membership

1. ASA member
2. IEEE member, IEEE SP Society member
3. IEEE, spoken language technology committee (SLTC) member
4. ISCA member

Media mentions

1. [VAANI Project \(Feb, 2024\)](#): Analytics India Magazine interview on project VAANI and other associated research work at SPIRE Lab.

2. **RESPIN Project (Sep, 2023)**: Deccan Herald reports the work on nine Indian languages in RESPIN Project in SPIRE Lab.
3. **SPIRE Lab Research Highlights (Jan, 2022)**: YourStory coverage - Different research threads happening at SPIRE Lab.
4. **English Gyani (Feb, 2020)**: BangaloreMirror reports ongoing work in SPIRE Lab on the IMPRINT project titled 'English Gyani - An intelligent assistant for tutoring English via learner-tutor interactions'
5. **Speech Disorder (Nov, 2015)**: Deccan Herald reports ongoing work on speech disorders in SPIRE Lab
6. **Whispered Speech (Aug, 2015)**: Deccan Herald reports ongoing work on whispered speech in SPIRE Lab