Achuth Rao M V

Experience

May-2022–present **Staff researcher**, *Qualcomm*, Bangalore
Working on low complexity models for speech applications

July-2021–April-2022 **Data scientist**, *Flipkart*, Bangalore
Worked on end to end automatic speech recognition for Indian Languages

Nov-2020–July-2021 **Post-doc research associate**, *Indian Institute of Science*, Bangalore, in Electrical Engineering

Nov-2020–Feb-2021 **R&D / Machine Learning intern**, *Ai Health Highway India*, Bangalore
Worked on fundamental heart sound segmentation.

July-2018–January-2019 **Research intern**, *TCS research and innovation*, Bangalore
Worked on automatic sleep arousal classification.

2012–2014 **Senior application engineer**, *Cypress Semiconductor*, Bangalore
Worked on capacitive touch sensing.

Education

Aug-2014–June-2021 **MS and Ph.D**, *Indian Institute of Science*, Bangalore, CGAPA: 7.2/8
In Electrical Engineering.

2008–2012 **Bachelor of engineering**, *RV college of engineering*, Bangalore, CGAPA: 9.3/10
In Electronics and communication engineering.

Selected Publications

Journals

- **Achuth Rao M V**, Yamini B K, Ketan J, Preetie Shetty A, Pal P, Shivashankar N, Prasanta Kumar Ghosh. "Automatic classification of healthy subjects and patients with essential vocal tremor using probabilistic source-filter model based noise robust pitch estimation", accepted in Journal of Voice.
- Varun Belagali, **Achuth Rao MV**, Pebbili Gopikishore, Rahul Krishnamurthy, and Prasanta Kumar Ghosh, "Two step convolutional neural network for automatic glottis localization and segmentation in stroboscopic videos", to appear in Biomedical Optics Express-2020.
- **Achuth Rao MV** and Prasanta Kumar Ghosh, "SFNet: A computationally efficient source filter model based neural speech synthesis", IEEE Signal Processing Letters-2020.
- **Achuth Rao MV** and Prasanta Kumar Ghosh, "Glottal inverse filtering using probabilistic weighted linear prediction", IEEE/ACM Transactions on Audio, Speech, and Language Processing-2019.

Electrical Engineering, IISc – 560012 – India
✉ *achuthr@iisc.ac.in* • *achuthrao.com/*
Skypeid: live:achuthraomv

- **Achuth Rao MV**, Shiny Victory J, and Prasanta Ghosh, "Effect of source filter interaction on isolated vowel-consonant-vowel perception", accepted in Journal of the Acoustical Society of America Express Letter (JASAEL), 2018.
- **Achuth Rao MV** and Prasanta Kumar Ghosh, "PSFM- a probabilistic source filter model for noise robust glottal closure instant detection" IEEE/ACM Transactions on Audio, Speech, and Language Processing-2018.
- **Achuth Rao MV** , Prakhar Gupta, Prasanta Kumar Ghosh, "P- and T-wave delineation in ECG signals using parametric mixture Gaussian and dynamic programming" Biomedical Signal Processing and Control-2019 .

Conferences

- Abinay Reddy Naini, Achuth Rao MV, Prasanta Kumar Ghosh, "Whisper to Neutral Mapping Using i-Vector Space Likelihood and a Cosine Similarity Based Iterative Optimization for Whispered Speaker Verification" accepted in NCC 2022. [Best paper Award (signal processing track)]
- Siddharth Subramani, **Achuth Rao M V**, Anwesha Roy, Prasanna Suresh Hegde, Prasanta Ghosh, "Segnet-based deep representation learning for dysphagia classification" accepted in ICASSP 2022.
- Abhayjeet Singh, **Achuth Rao M V**, Rakesh Vaideeswaran, Chiranjeevi Yarra and Prasanta Kumar Ghosh, "A study on native American English speech recognition by Indian listeners with varying word familiarity level", accepted in O-COCOSDA 2021.
- **Achuth Rao M V**, Shailesh B G, Drishti Ramesh Megalmani, Satish S Jeevannavar, Prasanta Ghosh, "Noise Robust Detection of Fundamental Heart Sound using Parametric Mixture Gaussian and Dynamic Programming" , accepted in EMBC-2021.
- Drishti Ramesh Megalmani*, Shailesh B G, **Achuth Rao M V**, Satish S Jeevannavar, Prasanta Ghosh, "Unsegmented Heart Sound Classification Using Hybrid CNN-LSTM Neural Networks" accepted in EMBC-2021
- Tilak Purohit, **Achuth Rao M V**, Prasanta Kumar Ghosh "Impact of speaking rate on the source filter Interaction in speech: a study", accepted in ICASSP-2021.
- Divya Degala, **Achuth Rao M V**, Rahul Krishnamurthy, Pebbili Gopikishore, Veeramani Priyadharshini, Prakash T K and Prasanta Ghosh, "Automatic Glottis Detection and Segmentation in Stroboscopic videos using Convolutional Networks", accepted in Interspeech 2020.
- Siddharth Subramani, **Achuth Rao M V**, Divya Giridhar, Prasanna Suresh Hegde, Prasanta Kumar Ghosh, "Automatic classification of volumes of water using swallow sounds from cervical auscultation", Accepted in ICASSP-2020.
- Sanjeev Kadagathur Vadiraj, **Achuth Rao M V**, Prasanta Kumar Ghosh, "Automatic identification of speakers from head gestures in a narration", Accepted in ICASSP-2020.
- Avni Rajpal, **Achuth Rao M V**, Chiranjeevi Yarra, Ritu Aggarwal, Prasanta Kumar Ghosh", Pseudo likelihood correction technique for low resource accented ASR", Accepted in ICASSP-2020.

- Abinay Reddy Naini*, **Achuth Rao MV***, Prasanta Kumar Ghosh, "Whisper to neutral mapping using cosine similarity maximization in i-vector space for speaker verification", Interspeech 2019, Graz Austria.
- **Achuth Rao MV**, Prasanta Kumar Ghosh, Tanuka Bhattacharjee, Anirban Dutta Choudhury, "Trend Statistics Network and Channel invariant EEG Network for sleep arousal study", in EMBC 2019, Berlin Germany.
- **Achuth Rao MV**, Rahul Krishnamurthy, Pebbili Gopikishore, Veeramani Priyadharshini and Prasanta Ghosh, "Automatic glottis localization and segmentation in stroboscopic videos using deep neural network",accepted in Interspeech 2018,Hyderabad, India. [Best Student paper award finalist]
- Abinay Reddy Naini, **Achuth Rao MV**, G. Nisha Meenakshi and Prasanta Ghosh, "Reconstructing neutral speech from prosthetic esophageal speech", accepted in Interspeech 2018, Hyderabad, India.
- **Achuth Rao MV** and Prasanta Kumar Ghosh, "Pitch Prediction from Mel-generalized Cepstrum – a Computationally Efficient Pitch Modeling Approach for Speech Synthesis", In 25th European Signal Processing Conference (EUSIPCO) 2017, Kos island, Greece.
- **Achuth Rao MV**, Kausthubha NK, Shivani Yadav, Dipanjan Gope, Uma Maheswari Krishnaswamy and Prasanta Kumar Ghosh, "Automatic Prediction of Spirometry Readings from Cough and Wheeze for Monitoring of Asthma Severity", In 25th European Signal Processing Conference (EUSIPCO) 2017, Kos island, Greece.
- **Achuth Rao MV**, Shivani Yadav and Prasanta Kumar Ghosh, "A dual source-filter model of snore audio for snorer group classification", In Interspeech 2017, Stockholm, Sweden.

Patents

- Tanuka Bhattacharjee, Deepan Das, Shahnawaz Alam, Anirban Dutta Choudhury, Rohan Banerjee, Arpan Pal, **Achuth Rao MV**, P. K. Ghosh "System and method for non-apnea sleep arousal detection." (granted)
- Tanuka Bhattacharjee, Anirban Dutta Choudhury, **Achuth Rao MV**, P. K. Ghosh "Method and System for Monitoring Sleep Arousal."

Projects

- Multiple source localization using deep learning methods
- Latent Fingerprint Enhancement using GANs
- Comparison of memory/time/sample complexity for the continued pre-training and adapters for transformer models.
- Automatic glottis localization and segmentation in stroboscopic videos
- Instance segmentation based on fast RCNN for dental image classification.
- Learning vector quantization using different distance metrics.
- Tracheoesophageal speech to Neutral speech conversion
- Automatic methods for acoustic analysis and assessment of dysphagia in Head and Neck Cancer patients

- Characterization of polysomnography signals for Sleep Stage Scoring and Arousal Detection
- Natural Non-Native English Speech Synthesis
- Speaker diarization for audio of an episode of big bang theory - 5 speakers + background laughter.
- Image Deblurring using Fast Iterative Shrinkage Thresholding Algorithm (FISTA).
- Cognitive Load classification from Speech.
- Low Power portable EEG with seizure detection.
- PSoC based pocket Oscilloscope.

Awards and Honours

- Interspeech 2018 travel grant
- Pratiksha travel grant
- Won 3^{rd} position in IISc chess competition
- MHRD scholarship
- Participated and won 1st position in "Circuit Design" at RV college of Engineering in 2011.
- Participated and won 3rd position in "MATLAB programming" conducted by MOOG at RV college of Engineering during 2011.
- Won second prize in TEXAS INSTRUMENTS ANALOG DESIGN CONTEST-2011.

Reviewing activity

- IEEE/ACM Transactions on Audio Speech and Language Processing (TASLP).
- Journal of the Acoustical Society of America (JASA).
- Circuits, Systems, and Signal Processing (CSSP)
- IEEE Access journal.
- Journal of computer speech language (CSL).
- International Conference on Acoustics, Speech, and Signal processing (ICASSP).

Computer Skills

- python scripting, shell scripting, c, c++.
- Tensorflow,PyTorch and keras for Deep learning.
- MATLAB signal processing.

References

- Prasanta Kumar Ghosh, Assistant Professor, Department of Electrical Engineering (EE), Indian Institute of Science (IISc), Bangalore. Email: prasantg@ee.iisc.ernet.in, Tel: +91 80 2293 2694.