

SHAIK MOHAMMAD RAFI B

✉ rafi@rguktrkv.ac.in 📞 +91-9000491304 📍 Proddatur, India
📄 shaik-mohammad-rafi-b-bb04b617



EDUCATION

Doctor of Philosophy (Ph.D.) (Pursuing), Electrical Engineering

IIT Hyderabad

📅 Jan 2017 - pursuing

Thesis Outline: Extracting fixed length robust speaker embeddings by exploiting phonetic information in supervised and unsupervised manner and feature information fusion.

Master of Technology (M.Tech) in Systems and Signal Processing

JNTU Hyderabad

📅 Sep 2009 - Aug 2011

Bachelor of Engineering (B.E.), Electronics and Communication Engineering

Vasavi College of Engineering, Hyderabad

📅 July 2005 - Apr 2009

EXPERIENCE

Assistant Professor

Dept of ECE, Rajiv Gandhi University of Knowledge Technologies

📅 Nov 2012 - till date

📍 R.K. Valley, Kadapa, India

- Taught various courses: Pattern Recognition and Machine Learning, Deep Learning, Statistical Signal Processing, Adaptive Signal Processing, Image Processing, Digital Signal Processing, Probability and Random processes etc.
- Mentored 50+ undergraduate projects in the areas of Robotics, Signal processing and Machine Learning, which lead the students to achieve multiple awards in various competitions, hackathons and conferences.
- Handled several administrative positions including, Lab Coordinator, Department Coordinator (HoD), Additional Campus Placement Coordinator and Alumni Coordinator.

Research Collaboration

SPIRE Lab, IISc-Bangalore

📅 June 2021 - May 2022

📍 R.K. Valley, Kadapa, India

- "*Speech Recognition in Agriculture and Finance for the Poor in India*" supervised by Dr. Prasanta Ghosh and funded by Bill & Melinda Gates Foundation.
Roles: Data collection including text collection, text scraping and speech data collection.

Project Associate

Speech Information Processing Lab, IIT-HYD

📅 Apr 2012 - Nov 2012

📍 Hyderabad, India

- "*Phonetically guided speech search engine for Indian Languages*" guided by Dr. K Sri Rama Murty (IIT-Hyderabad) under the supervision of Prof. B. Yegna Narayana (IIIT-Hyderabad) and funded by Department of Information Technology (DIT) India.
Roles: Collection of audio data from Telugu regional news channels and transcription of data into phonetics using the International Phonetic Alphabet (IPA). Developing a Hidden Markov Model (HMM) system for speech recognition.
- Built speaker recognition system for NIST SRE2012 speaker recognition challenge.
Roles: Extracting magnitude and phase based speech features. Developing Joint Factor Analysis (JFA) model based speaker recognition system (our system stood in 8th place globally).

- Developed a Speaker Diarization system using Bayesian Information Criterion on telugu news data.

AREAS OF INTEREST

Machine Learning & Deep Learning

Audio and Speech Information Processing

Image processing

Brain Computer Interface

Robotics

NOTABLE PROJECTS SUPERVISED

- Design of Smart Agriculture Bot that automatically waters plants using sensors and removes weed in Polyhouses. This design was *funded with Rs 3.3 Lakhs* in MANAGE, agriprenuer competition.
- Design of Autonomous Driving Vehicle prototype that involves road detection, pedestrian tracking, steering and speed control etc. This model won *first place* in ZF India Challenge 2017.
- Design of smart irrigation monitoring system that monitors water in the field through sensors and controls water pump through IoT. This model stood in *third place* in ZF India Challenge 2017.
- Consecutively won first place in technical exhibitions at institute level for Intelligent traffic surveillance system using drones, Language translator, Automatic cooking machine, Autonomous driving vehicle etc.

PUBLICATIONS

B. S. M. Rafi, S. Sankala and K. S. R. Murty, "Relative Significance of Speech Sounds in Speaker Verification Systems", In: *Circuits, Systems, and Signal Processing*, DOI: 10.1007/s00034-023-02360-z.

B. S. M. Rafi, K. S. R. Murty and S. Nayak, "A new approach for robust replay spoof detection in ASV systems," *2017 IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, 2017, pp. 51-55, doi: 10.1109/GlobalSIP.2017.8308602.

B. S. M. Rafi and K. S. R. Murty, "Importance of Analytic Phase of the Speech Signal for Detecting Replay Attacks in Automatic Speaker Verification Systems," *ICASSP 2019 - 2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2019, pp. 6306-6310, doi: 10.1109/ICASSP.2019.8683500.

S. Sankala, **B. S. M. Rafi** and K. S. R. Murty, "Multi-Feature Integration for Speaker Embedding Extraction," Accepted at *ICASSP 2022 - 2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*.

S. Sankala, **B. S. M. Rafi** and K. S. R. Murty, "Self Attentive Context dependent Speaker Embedding for Speaker Verification," *2020 National Conference on Communications (NCC)*, 2020, pp. 1-5, doi: 10.1109/NCC48643.2020.9056043.

S. Sreekanth, **B. S. M. Rafi**, K. S. R. Murty and S. Bhati, "Speaker Embedding Extraction with Virtual Phonetic Information," *2019 IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, 2019, pp. 1-5, doi: 10.1109/GlobalSIP45357.2019.8969551.

M. K. Tellamekala and **B. S. M. Rafi**, "Fragrance effect on beta band oscillations of primary visual and prefrontal cortices for reading tasks," *2016 International Conference on Signal Processing and Communications (SPCOM)*, 2016, pp. 1-5, doi: 10.1109/SPCOM.2016.7746640.

S. P. R. Bairaju and **B. S. M. Rafi**, "Consequences of various synaptic weights on the dynamics of structured recurrent hopfield nets," *2017 2nd International Conference for Convergence in Technology (I2CT)*, 2017, pp. 230-235, doi: 10.1109/I2CT.2017.8226126.

Tellamekala M., **B. S. M. Rafi** (2018) "Phase Reversal and Suppressed Carrier Characteristics of Neo-Cortical Electroencephalography Signals". In: *Progress in Intelligent Computing Techniques: Theory, Practice, and Applications. Advances in Intelligent Systems and Computing*, vol 719. Springer, Singapore. https://doi.org/10.1007/978-981-10-3376-6_59

Tellamekala M., **B. S. M. Rafi** (2018) "Band Power Tuning of Primary Motor Cortex EEG for Continuous Bimanual Movements". In: *Progress in Intelligent Computing Techniques: Theory, Practice, and Applications. Advances in Intelligent Systems and Computing*, vol 719. Springer, Singapore. https://doi.org/10.1007/978-981-10-3376-6_16

Vinay Ummadi, Aravind Gundlapalle, Althaf Shaik, **B. S. M. Rafi** "Autonomous Agriculture Robot for Smart Farming". In: <https://arxiv.org/abs/2208.01708>

MISCELLANEOUS

- Selected for IEEE Signal Processing Society Travel Grant, GlobalSIP-2017.
- Attended and conducted workshops and Conferences (example NIAS-2016, Interspeech-2018, NCC-2020).
- Selected for Junior Telecom Officer (JTO), BSNL in 2009.
- Completed training in TELEGENT TELESERVICES pvt ltd., Gurgaon, as RF survey and Drive Test engineer for a period of two months.