

## Curriculum Vitae

Prof. Ram Bilas Pachori  
Department of Electrical Engineering  
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### Work Experience:

- Professor at Department of Electrical Engineering, Indian Institute of Technology Indore, Indore, India from 18 December, 2017 to present. (Also Associated Faculty with Department of Biosciences & Biomedical Engineering and Center for Advanced Electronics)
- Visiting Professor at School of Medicine, Taylor's University, Subang Jaya, Malaysia, from 01 December, 2018 to 30 November 2019.
- Associate Professor at Department of Electrical Engineering, Indian Institute of Technology Indore, Indore, India from 27 September, 2013 to 17 December, 2017.
- Visiting Scholar at Intelligent Systems Research Centre, School of Computing and Intelligent Systems, Ulster University, Magee Campus, Northern Ireland, UK from 01 December, 2014 to 31 December, 2014.
- Assistant Professor at Department of Electrical Engineering, Indian Institute of Technology Indore, Indore, India from 02 December, 2009 to 26 September, 2013.
- Assistant Professor at Communication Research Center, International Institute of Information Technology, Hyderabad, India from 01 April, 2008 to 30 November, 2009.
- Post-Doctoral Fellow in the Charles Delaunay Institute, FRE CNRS 2848, System Modelling and Dependability Laboratory, University of Technology of Troyes, Troyes, France from 01 April, 2007 to 31 March, 2008.

### Research Interests:

- Signal and Image Processing
- Biomedical Signal Processing
- Non-stationary Signal Processing
- Speech Signal Processing
- Brain-Computer Interfacing
- Machine Learning
- Artificial Intelligence (AI) and Internet of Things (IoT) in Healthcare

### Education:

- Doctor of Philosophy (Ph.D.) in Signal Processing from Department of Electrical Engineering, Indian Institute of Technology Kanpur, Kanpur, India, April 2008.
- Master of Technology (M.Tech.) in Signal Processing from Department of Electrical Engineering, Indian Institute of Technology Kanpur, Kanpur, India, April 2003.
- Bachelor of Engineering (B.E.) with Honors in Electronics and Communication Engineering from Rajiv Gandhi Pradyogiki Vishwavidyalaya, Bhopal, India, June 2001.

### Thesis and Technical Reports:

1. R.B. Pachori, Development of new methodologies for human postural control, Technical report on post-doctoral research work, Charles Delaunay Institute, FRE CNRS 2848, University of Technology of Troyes, Troyes, France, February 2008. (Post-doctoral Supervisors: Prof. Hichem Snoussi, Prof. David Hewson, and Prof. Jacques Duchene)

2. R.B. Pachori, Methods based on Fourier-Bessel representation for analysis of non-stationary signals, Ph.D. thesis, Department of Electrical Engineering, Indian Institute of Technology Kanpur, Kanpur, India, January 2007. (Thesis Supervisor: Prof. Pradip Sircar)
3. R.B. Pachori, Time-frequency analysis of multi-component non-stationary signals, Master thesis, Department of Electrical Engineering, Indian Institute of Technology Kanpur, Kanpur, India, April 2003. (Thesis Supervisor: Prof. Pradip Sircar)

**Google Scholar Profile:** Citations: 8322, h index: 47, i10 index: 133 on 16<sup>th</sup> June, 2021. (Link: <https://scholar.google.co.in/citations?user=j3iJOWMAAAAJ&hl=en>)

### **Sponsored and Consultancy Projects:**

#### **Completed:**

1. Analysis and classification of EEG signals based on nonlinear and non-stationary signal models, Science and Engineering Research Board (SERB), Department of Science & Technology (DST), Total cost: Rs. 14,95,000, Duration: Three years (February 2012-February 2015), Awarded Excellent grade by DST Expert Committee in the review of the project. (Principal Investigator: Prof. Ram Bilas Pachori).
2. Development of new methodologies for analysis and classification of epileptic seizure EEG signals, Council of Scientific and Industrial Research (CSIR), Total cost: Rs. 19,80,200, Duration: Three years (December 2015-December 2018). (Principal Investigator: Prof. Ram Bilas Pachori).
3. Analysis of coronary artery disease by signal processing through MATLAB, Professional Group of Conferences (PGC), Visakhapatnam, India, Rs. 2,00,200, Duration: 20 months (August 2017-March 2019). (Consultant: Prof. Ram Bilas Pachori).
4. Development of a portable acoustic sensor based canine pregnancy detection system and biomarker-based canine pregnancy test kit, Department of Biotechnology (DBT), Total cost: Rs. 30,00,000, Duration: Two years (March 2018- March 2020). (Principal Investigator: Dr. Debasis Nayak, Co-Principal Investigators: Prof. Ram Bilas Pachori, Dr. Niranjana Sahoo, Dr. Gourinath Banda).
5. Misophonia brain signal analysis, Seed Funding, Uttarakhand Technical University, India, Total cost: Rs. 5,00,000, 2019. (Principal Investigator: Dr. Amit Agrawal, Co-Principal Investigators: Prof. Ram Bilas Pachori, Dr. Nimima S).
6. A multi-class computer-aided system for diagnosis of cardiovascular disease using non-invasively measured cardiac signals, TEQIP Collaborative Research Scheme, National Project Implementation Unit (NPIU), Government of India, Total cost: Rs. 10,46,000, Duration: June 2019-September 2020. (Principal Investigator: Dr. Abhay Upadhyay, Co-Principal Investigators: Prof. Ram Bilas Pachori, Dr. Rishi Raj Sharma, Mr. Shashikant Verma, Dr. Rajeev Sharma).
7. Detection of human brain disorders using novel machine learning approaches, CSIR, Total cost: Rs. 31,26,240, Duration: Three years (January 2018-January 2021). (Principal Investigator: Dr. M. Tanveer, Co-Principal Investigator: Prof. Ram Bilas Pachori).

#### **Ongoing:**

1. Advanced nonlinear filtering using improved quadrature rule, SERB, Government of India, Total cost: Rs. 33,00,000, Duration: Three years (February 2020-February 2023). (Principal Investigator: Dr. Abhinoy Kumar Singh, Co-Principal Investigator: Prof. Ram Bilas Pachori).
2. Indo-Norwegian collaboration in intelligent offshore mechatronics systems (INMOST), Norwegian Research Council (RCN) under INTPART Scheme, Total cost: 56,20,000 NOK (42,000 NOK for IIT Indore), Duration: Three years (2020-2023), (Lead Partner in Norway: Prof. Jing Zhou and Prof. Linga Reddy Cenkeramaddi, University of Agder (UiA), Norway, Participants from other institutes: Prof. Houxiang Zhang from NTNU, Norway, Dr. Jan Einar Gravdal from NORSE, Norway, Dr. Saidi Reddy Parne from NIT Goa, India, Dr. Santosh Kumar Vishvakarma, Co-Principal Investigator: Prof. Ram Bilas Pachori, Dr. Aruna Tiwari and Dr. Abhinoy Singh from IIT Indore, Dr. Rama Krishna Sai Gorthi from IIT Tirupati and Dr. Shaikhavali Chitraganti from IIT Palakkad).
3. Automated classification system for human emotions based on physiological signals, Council of Scientific and Industrial Research (CSIR), Total cost: Rs. 23,96,160, Duration: Three years (March 2021- March 2024). (Principal Investigator: Prof. Ram Bilas Pachori).

4. Implementation of Indo-South Korea Joint Network Center for Environmental Cyber Physical Systems, Indian Focal Coordinators: Dr. Santosh Kumar Vishvakarma, IIT Indore; Dr. Sachin Kumar Srivastava, IIT Roorkee; Dr. Sanjeev Sharma, IIT (BHU) Varanasi; Dr. Peeyush Soni, IIT Kharagpur; Korean Focal Coordinators: Dr. Sung Hun Jin, Incheon National University; Dr. Chulwoo Kim, Korea Univ.; Dr. Woong Choi, Sookmyung Univ.; Indian Investigators: Dr. Jai Gopal Pandey, CSIR-CEERI, Pilani; Dr. Bhupendra Singh Reniwal, IIITDM Kancheepuram; Dr. Ambika Prasad Shah, IIT Jammu; Shri Jayaraj U Kidav, NIELIT, Calicut; Dr. Vaibhav Neema, IET-DAVV Indore; Dr. Ajay Kumar Kushwaha, IIT Indore; Dr. Hemen K. Kalita, Guwahati University; Prof. Vimal Bhatia, IIT Indore; Prof. R.B. Pachori, IIT Indore, Dr. M. Sabarimalai Manikandan, IIT Bhubaneswar; Prof. G. S. Murthy, IIT Indore; Dr. Manish Kumar Goyal, IIT Indore; Prof. S. Prakash, IET-DAVV Indore; Korean Investigators: Dr. Junyoung Song & Dr. Taehui Na, Incheon National University; Dr. Chulwoo Kim, Korea Univ.; Dr. Woong Choi, Sookmyung Univ, Total cost: Rs. 1,17,84,720, 03 years (January 2021-January 2024).
5. Development of an affordable wearable IoT-GPS enabled intelligent vital signs monitor for smart health monitoring services, Grant in aid, Department of Health Research, Indian Council of Medical Research, Government of India, Total cost: Rs. 1,23,49,960, Duration: Two years (2021-2023). (Principal Investigator: Prof. Ram Bilas Pachori, Co-Principal Investigator: Dr. M Sabarimalai Manikandan, IIT Bhubaneswar), Approved.

#### Research Publications:

##### Books:

1. D. Gupta, R.S. Goswami, S. Banerjee, M. Tanveer, and R.B. Pachori, Pattern recognition and data analysis with applications, *Springer*, 2021. Approved.
2. S.K. Pani, S.K. Singh, R.B. Pachori, L. Garg, and X. Zhang, Intelligent data analytics for terror threat prediction: Architectures, methodologies, techniques and applications *Wiley-Scrivener*, 2020, ISBN: 9781119711094.
3. D.S. Sisodia, R.B. Pachori, and L. Garg, Advancement of artificial intelligence in healthcare engineering, *IGI Global*, 2020, ISBN: 9781799821205.
4. M. Tanveer and R.B. Pachori, Machine intelligence and signal analysis, *Advances in Intelligent Systems and Computing*, Springer, 2018, ISBN: 978-981-13-0923-6.
5. R.B. Pachori and P. Sircar, Non-stationary signal analysis: Methods based on Fourier-Bessel representation, *LAP LAMBERT Academic Publishing*, Saarbrucken, Germany, 2010, ISBN: 978-3-8433-8807-8.

##### Book Chapters:

1. P.K. Chaudhary and R.B. Pachori, Denoising of biomedical images using two-dimensional Fourier-Bessel series expansion based empirical wavelet transform, *Assistive Technology Intervention in Healthcare Publisher*, CRC, Taylor & Francis Group, U.K., 2021.
2. P. Gaur, V. Malaviya, A. Gupta, G. Bhatia, B. Mishra, R.B. Pachori, and D. Sharma, An optimal model selection for COVID 19 disease classification, *Biomedical Signal and Image Processing with Artificial Intelligence*, EAI/ Springer, 2021.
3. A. Ullal and R.B. Pachori, Variational mode decomposition based automated diagnosis method for epilepsy using EEG signals, In: S. Day, S.K. Pani, J. Rodrigues, and B. Majhi (Eds.) *Deep Learning, Machine Learning and IoT in Biomedical and Health Informatics Techniques and Applications*, *Biomedical Engineering*, CRC Press, 2021.
4. P.S. Ramya, K. Yashasvi, A. Anjum, A. Bhattacharyya, and R.B. Pachori, Development of an effective computing framework for classification of motor imagery EEG signals for brain-computer interface, In: S. Jain, M. Sood, and S. Paul (Eds) *Advances in Computational Intelligence Techniques*, Springer, 2020.
5. R.R. Sharma, P. Meena, and R.B. Pachori, Enhanced time-frequency representation based on variational mode decomposition and Wigner-Ville distribution, In: S. Jain and S. Paul (Eds.) *Recent Trends in Image and Signal Processing in Computer Vision*, Springer, 2020.
6. D. Bhati, A. Raikwar, R.B. Pachori, and V.M. Gadre, Three channel wavelet filter banks with minimal time frequency spread for classification of seizure-free and seizure EEG signals, In: D.S. Sisodia, R.B. Pachori, and L. Garg (Eds.) *Advancement of Artificial Intelligence in Healthcare Engineering*, IGI Global, 2020.

7. R. Singh and R.B. Pachori, Iterative filtering based automated method for detection of normal and ALS EMG signals, In: S. Jain and S. Paul (Eds.) *Recent Trends in Image and Signal Processing in Computer Vision*, Springer, 2020.
8. R. Sharma, P. Sircar, and R.B. Pachori, Automated seizures classification using deep neural network based on autoencoder, In: D.S. Sisodia, R.B. Pachori, and L. Garg (Eds.) *Advancement of Artificial Intelligence in Healthcare Engineering*, IGI Global, 2020.
9. R.B. Pachori and V. Gupta, Biomedical engineering fundamentals, In: F. Firouzi, K. Chakrabarty, and S. Nassif (Eds.) *Intelligent Internet of Things: From Device, to Fog, and Cloud*, Springer, 2020.
10. R. Sharma, P. Sircar, and R.B. Pachori, Computer-aided diagnosis of epilepsy using bispectrum of EEG signals, In: S. Paul (Ed.) *Application of Biomedical Engineering in Neuroscience*, Springer, 2019.
11. R.R. Sharma, M. Kumar, and R.B. Pachori, Classification of EMG signals using eigenvalue decomposition based time-frequency representation, In: N. Sriraam (Ed.) *Biomedical and Clinical Engineering for Healthcare Advancement*, IGI Global, 2019.
12. A. Agrawal, L. Garg, E.E. Audu, R.B. Pachori, and J.H.G. Dauwels, Early detection of epileptic seizures based on scalp EEG signals, In: K.C. Santosh, S. Antani, D.S. Guru, and N. Dey (Eds.) *Medical imaging: Artificial Intelligence, Image Recognition, and Machine Learning Techniques*, CRC Press, 2019.
13. V. Gupta, A. Bhattacharyya, and R.B. Pachori, Automated identification of epileptic seizures from EEG signals using FBSE-EWT method, In: G.R. Naik (Ed.) *Biomedical Signal Processing-Advances in Theory, Algorithms and Applications*, Springer, 2019.
14. D. Bhati, R.B. Pachori, M. Sharma, and V.M. Gadre, Automated detection of seizure and nonseizure EEG signals using two-band biorthogonal wavelet filter banks, In: G.R. Naik (Ed.) *Biomedical Signal Processing-Advances in Theory, Algorithms and Applications*, Springer, 2019.
15. R. Sharma and R.B. Pachori, Automated classification of focal and non-focal EEG signals based on bivariate empirical mode decomposition, In: M.H. Kolekar and V. Kumar (Eds.) *Biomedical Signal and Image Processing in Patient Care*, IGI Global, 2017.
16. R.B. Pachori, R. Sharma, and S. Patidar, Classification of normal and epileptic seizure EEG signals based on empirical mode decomposition, In: Q. Zhu and A.T. Azar (Eds.) *Complex System Modelling and Control through Intelligent Soft Computations, Studies in Fuzziness and Soft Computing*, Springer International Publishing, Switzerland, 2015.
17. S. Patidar and R.B. Pachori, Classification of heart disorders based on tunable-Q wavelet transform of cardiac sound signals, In: A.T. Azar and S. Vaidyanathan (Eds.) *Chaos Modelling and Control Systems Design, Studies in Computational Intelligence*, Springer International Publishing, Switzerland, 2015.
18. V. Bajaj and R.B. Pachori, Detection of human emotions using features based on the multiwavelet transform of EEG signals, In: A.E. Hassanien and A.T. Azar (Eds.) *Brain-Computer Interfaces: Current Trends and Applications*, Intelligent Systems Reference Library, Springer International Publishing, Switzerland, 2015.

#### Journal Papers:

1. A. Tiwari, R.B. Pachori, P.K. Sanjram, Isomorphic 2D/3D objects and saccadic characteristics in mental rotation, *Computers, Materials & Continua*, In press, 2021.
2. D.S. Ramteke, R.B. Pachori, and A. Parey, Automated gearbox fault diagnosis using entropy-based features in flexible analytic wavelet transform (FAWT) domain, *Journal of Vibration Engineering & Technologies*, In press, 2021.
3. A. Nishad and R.B. Pachori, Classification of epileptic electroencephalogram signals using tunable-Q wavelet transform based filter-bank, *Journal of Ambient Intelligence and Humanized Computing*, In press, 2021.
4. A. Nishad, R.B. Pachori, and U.R. Acharya, Application of TQWT filter-bank for sleep apnea screening using ECG signals, *Journal of Ambient Intelligence and Humanized Computing*, In press, 2021.
5. P.K. Chaudhary and R.B. Pachori, FBSED based automatic diagnosis of COVID-19 using X-ray and CT images, *Computers in Biology and Medicine*, vol. 134, 104454, pp. 1-13, July 2021.

6. B. Fatimah, P. Singh, A. Singhal, D. Pramanick, S. Pranav, and R.B. Pachori, Efficient detection of myocardial infarction from single lead ECG signal, *Biomedical Signal Processing and Control*, vol. 68, 102678, pp. 1-9, July 2021.
7. P. Gaur, K. McCreadie, R.B. Pachori, H. Wang, and G. Prasad, An automatic subject specific channel selection method for enhancing motor imagery classification in EEG-BCI using correlation, *Biomedical Signal Processing and Control*, vol. 68, 102574, pp. 01-08, July 2021.
8. V.K. Mehla, A. Singhal, P. Singh, R.B. Pachori, An efficient method for identification of epileptic seizures from EEG signals using Fourier analysis, *Physical and Engineering Sciences in Medicine*, vol. 44, pp. 443-456, June 2021.
9. R. Shukla, P.K. Kankar, and R.B. Pachori, Automated bearing fault classification based on discrete wavelet transform method, *Life Cycle Reliability and Safety Engineering*, vol. 10, pp. 99-111, June 2021.
10. S. Khan and R.B. Pachori, Automated detection of posterior myocardial infarction from vectorcardiogram signals using Fourier-Bessel series expansion based empirical wavelet transform, *IEEE Sensors Letters*, vol. 5, issue 5, pp. 1-4, May 2021.
11. K. Das and R.B. Pachori, Schizophrenia detection technique using multivariate iterative filtering and multichannel EEG signals, *Biomedical Signal Processing and Control*, vol. 67, 102525, pp. 01-10, May 2021.
12. B. Fatimah, P. Singh, A. Singhal, and R.B. Pachori, Hand movement recognition from sEMG signals using Fourier decomposition method, *Biocybernetics and Biomedical Engineering*, vol. 41, issue 02, pp. 690-703, April-June 2021.
13. A. Singhal, M. Agarwal, and R.B. Pachori, Directional local ternary co-occurrence pattern for natural image retrieval, *Multimedia Tools and Applications*, vol. 80, pp. 15901-15920, April 2021.
14. R. Panda, S. Jain, R.K. Tripathy, R.R. Sharma, and R.B. Pachori, Sliding mode singular spectrum analysis for the elimination of cross-terms in Wigner-Ville distribution, *Circuits, Systems, and Signal Processing*, vol. 40, pp. 1207-1232, March 2021.
15. P. Gaur, H. Gupta, A. Chowdhury, K. McCreadie, R.B. Pachori, and H. Wang, A sliding window common spatial pattern for enhancing motor imagery classification in EEG-BCI, *IEEE Transactions on Instrumentation and Measurement*, vol. 70, article sequence number: 4002709, pp. 1-9, February 2021.
16. A. Bhattacharyya, R.K. Tripathy, L. Garg, and R.B. Pachori, A novel multivariate-multiscale approach for computing EEG spectral and temporal complexity for human emotion recognition, *IEEE Sensors Journal*, vol. 21, no. 3, pp. 3579-3591, February 2021.
17. S.R. Nayak, D.R. Nayak, U. Sinha, V. Arora, and R.B. Pachori, Application of deep learning techniques for detection of COVID-19 cases using chest X-ray images: A comprehensive study, *Biomedical Signal Processing and Control*, vol. 64, 102365, pp. 1-12, February 2021.
18. V. Gupta and R.B. Pachori, FBDM based time-frequency representation for sleep stages classification using EEG signals, *Biomedical Signal Processing and Control*, vol. 64, 102265, pp. 1-16, February 2021.
19. P.K. Chaudhary and R.B. Pachori, Automatic diagnosis of glaucoma using two-dimensional Fourier-Bessel series expansion based empirical wavelet transform, *Biomedical Signal Processing and Control*, vol. 64, 102237, pp. 1-17, February 2021.
20. R.U. Khan, M. Tanveer, and R.B. Pachori, and ADN Initiative (ADNI), A novel method for the classification of Alzheimer's disease from normal controls using magnetic resonance imaging, *Expert Systems*, vol. 38, 01, e12566, January 2021.
21. A. Upadhyay, M. Sharma, R.B. Pachori, and R. Sharma, A non-parametric approach for multicomponent AM-FM signal analysis, *Circuits, Systems, and Signal Processing*, vol. 39, pp. 6316-6357, December 2020.
22. A. Gupta, R.U. Khan, V.K. Singh, M. Tanveer, D. Kumar, A. Chakraborti, and R.B. Pachori, A novel approach for classification of mental tasks using multiview ensemble learning (MEL), *Neurocomputing*, vol. 417, pp. 558-584, December 2020.
23. A. Singhal, R. Shukla, P.K. Kankar, S. Dubey, S. Singh, and R.B. Pachori, Comparing the capabilities of transfer learning models to detect skin lesion in humans, *Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine*, vol. 234, issue 10, pp. 1083-1093, October 2020.

24. T. Siddharth, P. Gajbhiye, R.K. Tripathy, and R.B. Pachori, EEG based detection of focal seizure area using FBSE-EWT rhythm and SAE-SVM network, *IEEE Sensors Journal*, vol. 20, issue 19, pp. 11421-11428, October 2020.
25. V. Gupta and R.B. Pachori, Classification of focal EEG signals using FBSE based flexible time-frequency coverage wavelet transform, *Biomedical Signal Processing and Control*, vol. 62, 102124, pp. 1-9, September, 2020.
26. H. Singh, R.K. Tripathy, R.B. Pachori, Detection of sleep apnea from heart beat interval and ECG derived respiration signals using sliding mode singular spectrum analysis, *Digital Signal Processing*, vol. 104, 102796, pp. 1-13, September, 2020.
27. B. Fatimaha, P. Singh, A. Singhal, and R.B. Pachori, Detection of apnea events from ECG segments using Fourier decomposition method, *Biomedical Signal Processing and Control*, vol. 61, 102005, pp. 1-10, August, 2020.
28. J.A. de la O Sema, M.R.A. Patemina, A.Z. Mendez, R.K. Tripathy, and R.B. Pachori, EEG-rhythm specific Taylor-Fourier filter bank implemented with O-splines for the detection of epilepsy using EEG signals, *IEEE Sensors Journal*, vol. 20, issue 02, pp. 6542–6551, June 2020.
29. R. Sharma, R.B. Pachori, and P. Sircar, Seizures classification based on higher order statistics and deep neural network, *Biomedical Signal Processing and Control*, vol. 59, 101921, May 2020.
30. A.K. Shukla, R.K. Pandey, and R.B. Pachori, A fractional filter based efficient algorithm for retinal blood vessel segmentation, *Biomedical Signal Processing and Control*, vol. 59, 101883, May 2020.
31. A. Anuragi, D. Sisodia, and R.B. Pachori, Automated alcoholism detection using Fourier-Bessel series expansion based empirical wavelet transform, *IEEE Sensors Journal*, vol. 20, issue 9, pp. 4914-4924, May 2020.
32. P. Gajbhiye, R.K. Tripathy, and R.B. Pachori Elimination of ocular artifacts from single channel EEG signals using FBSE-EWT based rhythms, *IEEE Sensors Journal*, vol. 20, issue 07, pp. 3687-3696, April 2020.
33. R. Sharma, R.B. Pachori, P. Sircar, Automated emotion recognition based on higher order statistics and deep learning algorithm, *Biomedical Signal Processing and Control*, vol. 58, 101867, pp. 1-10, April 2020.
34. D.R. Nayak, R. Dash, B. Majhi, R.B. Pachori, and Y. Zhang, A deep stacked random vector functional link network autoencoder for diagnosis of brain abnormalities and breast cancer, *Biomedical Signal Processing and Control*, vol. 58, 101860, pp. 1-11, April 2020.
35. S. Madhavan, R.K. Tripathy, and R.B. Pachori, Time-frequency domain deep convolutional neural network for the classification of focal and non-focal EEG signals, *IEEE Sensors Journal*, vol. 20, issue 06, pp. 3078-3086, March 2020.
36. R. Sharma, P. Sircar, and R.B. Pachori, Automated focal EEG signal detection based on third order cumulant function, *Biomedical Signal Processing and Control*, vol. 58, 101856, pp. 1-8, April 2020.
37. R.R. Sharma, A. Kalyani, and R.B. Pachori, An empirical wavelet transform based approach for cross-terms free Wigner-Ville distribution, *Signal, Image, and Video Processing*, vol. 14, pp. 249-256, March 2020.
38. A. Singhal, P. Singh, B. Fatimah, and R.B. Pachori, An efficient removal of powerline interference and baseline wander from ECG signals by employing Fourier decomposition technique, *Biomedical Signal Processing and Control*, vol. 57, 101741, pp. 1-8, March 2020.
39. A.K. Shukla, R. Pandey, S. Yadav, and R.B. Pachori, Generalized fractional filter based algorithm for image denoising, *Circuits, Systems, and Signal Processing*, vol. 39, issue 01, pp. 363-390, January 2020.
40. D.S. Ramteke, A. Parey, and R.B. Pachori, Automated gear fault detection of micron level wear in bevel gears using variational mode decomposition, *Journal of Mechanical Science and Technology*, vol. 33, no. 12, pp. 5769-5777, December 2019.
41. P. Gaur, K. McCreadie, R.B. Pachori, H. Wang, and G. Prasad, Tangent space features based transfer learning classification model for two-class motor imagery brain-computer interface, *International Journal of Neural Systems*, vol. 29, no. 10, 1950025, December 2019.

42. T. Siddharth, R.K. Tripathy, and R.B. Pachori, Discrimination of focal and non-focal seizures from EEG signals using sliding mode singular spectrum analysis, *IEEE Sensors Journal*, vol. 19, issue 24, pp. 12286-12296, December 2019.
43. S.K. Ghosh, R.K. Tripathy, R.N. Ponnalagu, and R.B. Pachori, Automated detection of heart valve disorders from PCG signal using time-frequency magnitude and phase features, *IEEE Sensors Letters*, vol. 3, issue 12, pp. 1-4, December 2019.
44. R.K. Tripathy, A. Bhattacharyya, and R.B. Pachori, Localization of myocardial infarction from multi lead electrocardiogram signals using multiscale convolution neural network, *IEEE Sensors Journal*, vol. 19, no. 23, pp. 11437-11448, December 2019.
45. D.K. Agrawal, B.S. Kirar, and R.B. Pachori, Automated glaucoma detection using quasi-bivariate variational mode decomposition from fundus images, *IET Image Processing*, vol. 13, issue 13, pp. 2401-2408, November 2019.
46. P. Gajbhiye, R.K. Tripathy, A. Bhattacharyya, and R.B. Pachori, Novel approaches for the removal of motion artifact from EEG signals, *IEEE Sensors Journal*, vol. 19, issue 02, pp. 10600-10608, November 2019.
47. V. Gupta and R.B. Pachori, Epileptic seizure identification using entropy of FBSE based EEG rhythms, *Biomedical Signal Processing and Control*, vol. 53, 101569, pp. 1-11, August 2019.
48. P. Gaur, R.B. Pachori, H. Wang, and G. Prasad, An automatic subject specific intrinsic mode function selection for enhancing two-class EEG based motor imagery-brain computer interface, *IEEE Sensors Journal*, vol. 19, no. 16, pp. 6938-6947, August 2019.
49. R. Katiyar, V. Gupta, and R.B. Pachori, FBSE-EWT-based approach for the determination of respiratory rate from PPG signals, *IEEE Sensors Letters*, vol. 03, no. 07, article sequence no. 7001604, July 2019.
50. A. Bhattacharyya, R. Ranta, S. Le Cam, V. Louis-Dorr, L. Tyvaert, S. Colnat-Coulbois, L. Maillard, and R. B. Pachori, A multi-channel approach for cortical stimulation artefact suppression in depth EEG signals using time-frequency and spatial filtering, *IEEE Transactions on Biomedical Engineering*, vol. 66, issue 07, pp. 1915-1926, July 2019.
51. R.K. Tripathy, A. Bhattacharyya, and R.B. Pachori, A novel approach for detection of myocardial infarction from ECG signals of multiple electrodes, *IEEE Sensors Journal*, vol. 19, issue 12, pp. 4509-4517, June 2019.
52. R.R. Sharma, M. Kumar, and R.B. Pachori, Joint time-frequency domain based CAD disease sensing system using ECG signals, *IEEE Sensors Journal*, vol. 09, no. 10, pp. 3912-3920, May 2019.
53. R.R. Sharma, A. Kumar, R.B. Pachori, and U.R. Acharya, Accurate automated detection of congestive heart failure using eigenvalue decomposition based features extracted from HRV signals, *Biocybernetics and Biomedical Engineering*, vol. 39, issue 02, pp. 312-327, April-June 2019.
54. A. Nishad, R.B. Pachori, and U.R. Acharya, Automated classification of hand movements using tunable-Q wavelet transform based filter-bank with surface electromyogram signals, *Future Generation Computer Systems*, vol. 93, pp. 96-110, April 2019.
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39. R. Sharma, R.B. Pachori, and S. Gautam, Empirical mode decomposition based classification of focal and non-focal EEG signals, *IEEE International Conference on Medical Biometrics*, 30 May-01 June, 2014, Shenzhen, China.
40. V. Bajaj and R.B. Pachori, Human emotion classification from EEG signals using multiwavelet transform, *IEEE International Conference on Medical Biometrics*, 30 May-01 June, 2014, Shenzhen, China.
41. P.S. Rathore and R.B. Pachori, Instantaneous fundamental frequency estimation of speech signals using DESA in low-frequency region, *IEEE International Conference on Signal Processing and Communication*, pp. 470-473, 12-14 December, 2013, Noida, India.
42. R. Bodade, R.B. Pachori, A. Gupta, P. Kanani, and D. Yadav, A novel approach for automated skew correction of vehicle number plate using principal component analysis, *IEEE International Conference on Emerging Trends in Communication, Control, Signal Processing and Computing Applications*, 10-11 October, 2013, Bangalore, India.
43. P. Jain and R.B. Pachori, GCI identification from voiced speech using the eigen value decomposition of Hankel matrix, *IEEE 8th International Symposium on Image and Signal Processing and Analysis*, pp. 371 - 376, 04-06 September, 2013, Trieste, Italy.
44. P. Kanani, A. Gupta, D. Yadav, R. Bodade, and R.B. Pachori, Vehicle license plate localization using wavelets, *IEEE Conference on Information and Communication Technologies*, 11-12 April, 2013, Thuckalay, India.
45. S. Patidar and R.B. Pachori, A continuous wavelet transform based method for detecting heart valve disorders using phonocardiograph signals, *International Conference on Convergence and Hybrid Information Technology*, CCIS 310, pp. 513-520, 23-25 August, 2012, Daejeon, South Korea.

46. V. Bajaj and R.B. Pachori, Separation of rhythms of EEG signals based on Hilbert-Huang transformation with application to seizure detection, *International Conference on Convergence and Hybrid Information Technology*, LNCS 7425, pp. 493-500, 23-25 August, 2012, Daejeon, South Korea. (Best Paper Award)
47. V. Bajaj and R.B. Pachori, EEG signal classification using empirical mode decomposition and support vector machine, *International Conference on Soft Computing for Problem Solving*, AISC 131, pp. 623-635, 20-22 December, 2011, Roorkee, India.
48. V. Bajaj and R.B. Pachori, Application of the sample entropy for discrimination between seizure and seizure-free EEG signals, *5th Indian International Conference on Artificial Intelligence*, pp. 1232-1247, 14-16 December, 2011, Tumkur, India.
49. P. Jain and R.B. Pachori, A new approach for glottal closure instants detection from speech signals, *5th Indian International Conference on Artificial Intelligence*, pp. 1216-1231, 14-16 December, 2011, Tumkur, India.
50. R.B. Pachori and D. Hewson, Identification of time-varying effects of sensory perturbations for postural stability analysis, *5th Indian International Conference on Artificial Intelligence*, pp. 1280-1292, 14-16 December, 2011, Tumkur, India.
51. R.B. Pachori, J. Gadewadikar, and O. Kuljaca, Classification of EEG signals based on empirical mode decomposition and Bayesian networks application, *Seventy-Fifth Annual Meeting*, University of Southern Mississippi, USA, 17-18 February, 2011 (Abstract Issue of Journal of the Mississippi Academy of Sciences, vol. 56, no. 1, pp. 101, Jan 2011).
52. A. Parey and R.B. Pachori, Modified empirical mode decomposition process for improved fault diagnosis, *8th IFToMM International Conference on Rotor Dynamics*, pp. 261-265, 12-15 September, 2010, Seoul, Korea.
53. R.B. Pachori and S.V. Gangashetty, AM-FM model based approach for detection of glottal closure instants, *IEEE International Conference on Information Science, Signal Processing and their Applications*, pp. 266-269, 10-13 May, 2010, Kuala Lumpur, Malaysia.
54. R.B. Pachori and S.V. Gangashetty, Detection of voice onset time using FB expansion and AM-FM model, *IEEE International Conference on Information Science, Signal Processing and their Applications*, 149-152, 10-13 May, 2010, Kuala Lumpur, Malaysia.
55. S. Chhabra, R. Bajaj, R.B. Pachori, and R.N. Biswas, Features based on Fourier-Bessel expansion for application of speaker identification system, *Proceedings Indian Conference for Academic Research by Undergraduate Students*, 26-28 March, 2010, IIT Kanpur, India.
56. P. Sircar, R.B. Pachori, and R. Kumar, Analysis of rhythms of EEG signals using orthogonal polynomial approximation, *ACM International Conference on Convergence and Hybrid Information Technology*, pp. 176-180, 27-29 August, 2009, Daejeon, South Korea.
57. R.B. Pachori, D. Hewson, H. Snoussi, and J. Duchne, Postural time-series analysis using empirical mode decomposition and second-order difference plots, *IEEE International Conference on Acoustics, Speech, and Signal Processing*, pp. 537-540, 19-24 April, 2009, Taipei, Taiwan.
58. R.B. Pachori, D. Hewson, H. Snoussi, and J. Duchene, Analysis of center of pressure signals using empirical mode decomposition and Fourier-Bessel expansion, *IEEE Tencon Conference*, Article no. 4766596, 18-21 November, 2008, Hyderabad, India.
59. R.B. Pachori and P. Sircar, Time-frequency analysis using time-order representation and Wigner distribution, *IEEE Tencon Conference*, Article no. 4766782, 18-21 November, 2008, Hyderabad, India.
60. R.B. Pachori and P. Sircar, Modeling of multicomponent AM-FM signals using FB expansion and linear TVAR process, *16th European Signal Processing Conference*, 25-29 August, 2008, Lausanne, Switzerland.
61. R.B. Pachori and P. Sircar, Speech analysis using Fourier-Bessel expansion and discrete energy separation algorithm, *IEEE Digital Signal Processing Workshop and Workshop on Signal Processing Education*, pp. 423-428, 24-27 September, 2006, Wyoming, USA.
62. R.B. Pachori and P. Sircar, Analysis of multicomponent nonstationary signals using Fourier-Bessel transform and Wigner distribution, *14th European Signal Processing Conference*, 04-08 September, 2006, Florence, Italy.

63. J. Kumar and R.B. Pachori, A novel technique for merging of multisensor and defocussed images using multiwavelets, *IEEE Tencn Conference*, pp. 1733-1738, 22-24 November, 2005, Melbourne, Australia.
64. R.B. Pachori and P. Sircar, A novel technique to reduce cross terms in the squared magnitude of the wavelet transform and the short time Fourier transform, *IEEE International Workshop on Intelligent Signal Processing*, pp. 217-222, 01-03 September, 2005, Faro, Portugal.
65. R.B. Pachori and P. Sircar, Modeling of time varying AR process using nonlinear energy operator, *IEEE 8th International Symposium on Signal Processing and its Applications*, pp. 643-646, 28-30 August, 2005, Sydney, Australia.
66. R.B. Pachori and P. Sircar, A new technique to reduce cross terms in the Wigner distribution, *11th National Conference on Communications*, pp. 427-431, 28-30 January, 2005, IIT Kharagpur, India.

#### **Short-Term Courses, Webinars, and Conference Organized:**

1. Short-term course on Signal and image processing, 30-31 May, 2015, Department of Electrical Engineering, Indian Institute of Technology Indore, Indore, India. (with Dr. V. Kanhangad).
2. Short-term course on Condition monitoring of mechanical systems using advanced signal processing, 27-28 June, 2016, School of Engineering, Indian Institute of Technology Indore, Indore, India. (with Prof. A. Parey).
3. Short-term course on Condition monitoring of mechanical and electrical systems using advanced signal processing techniques, 06-07 March, 2017, School of Engineering, Indian Institute of Technology Indore, Indore, India. (with Prof. A. Parey).
4. International conference on Machine intelligence and signal processing, 22-24 December, 2017, Indian Institute of Technology Indore, Indore, India. (with Dr. M. Tanveer).
5. Short term course on Advanced signal processing techniques for fault detection of mechanical and electrical systems, 10-11 March, 2018, School of Engineering, Indian Institute of Technology Indore, Indore, India. (with Prof. A. Parey).
6. Short term course on Artificial intelligence and advanced signal processing techniques for engineering applications, 05-07 October, 2018, Indian Institute of Technology Indore, Indore, India (with Prof. A. Parey).
7. Short term course on Control system and signal processing: Solutions to biomedical problems, 03-04 June, 2019, Indian Institute of Technology Indore, Indore, India (with Dr. A.K. Singh).
8. TEQIP-III 6-days short term course on Industrial applications of control systems and signal processing, 19-24 August, 2019, Indian Institute of Technology Indore, Indore, India (with Dr. A.K. Singh).
9. Faculty training programme on Data science & analytics, Sponsored by TEQIP-III, MHRD, 02-12 March, 2020, IIT Indore, Indore, India (with Dr. P. Kar, Dr. M. Tanveer, Dr. A. Dutta, Dr. S. Manna, and Dr. S. Das).
10. An online short term course on Signal processing and machine learning techniques for automated fault detection of mechanical systems, 16-17 June, 2020, Indian Institute of Technology Indore, Indore, India (with Prof. A. Parey).
11. An online short term course on Signal processing and machine learning methods and their applications, 22-24 August, 2020, Indian Institute of Technology Indore, Indore, India.
12. A webinar on Fourier-Bessel series expansion and its applications in signal processing, 13<sup>th</sup> September, 2020, Indian Institute of Technology Indore, Indore, India.
13. A webinar on Computer-aided medical diagnosis of heart and brain diseases, 11<sup>th</sup> October, 2020, Indian Institute of Technology Indore, Indore, India.
14. TEQIP-III sponsored short-term course on Current trends in biomedical signal and image processing, 20-22 October, 2020, Indian Institute of Technology Indore, Indore, India.
15. A webinar on Time-frequency analysis, 01<sup>st</sup> November, 2020, Indian Institute of Technology Indore, Indore, India.



16. TEQIP-III sponsored short term course on Artificial intelligence driven biomedical data analysis for disease diagnosis, 05 days, 05-10 November, 2020, Indian Institute of Technology Indore, Indore, India. (with Dr. M. Tanveer)
17. TEQIP-III sponsored faculty training on Future skill technologies on artificial intelligence and machine learning, 08 days, 20-27 November, 2020, Indian Institute of Technology Indore, Indore, India (with Dr. M. Tanveer, Dr. Aruna Tiwari, and Dr. Md. Aquil Khan)
18. QIP sponsored short term course on Computational methods in signal processing and machine learning, 06 days, 14-19 December, 2020, Indian Institute of Technology Indore, Indore, India.
19. QIP sponsored short term course on Matrix computation and its application to system, signal and control problems, 16-21 February, 2021, Indian Institute of Technology Indore, Indore, India. (with Dr. Niraj K Shukla and Dr. Sk. Safique Ahmad)
20. Online short term course on Time-frequency analysis and applications, 17-18 April, 2021, Centre for Advanced Electronics, Indian Institute of Technology Indore, Indore, India.
21. GIAN course on Health AI: Artificial intelligence (AI) applications in healthcare, 3-7 August, 2020, IIT Indore, Indore, India (Foreign faculty: Dr. Lalit Garg, University of Malta, Malta), Approved.

#### **Development of New Courses:**

1. EE 740: Speech Signal Processing
2. EE 641: Advanced Signal Processing
3. EE 701: Time-Frequency Analysis
4. EE 645: Mathematical Methods for Signal Processing

#### **Subjects Taught:**

1. Digital Signal Processing (UG, EC 4100, EE 304), Spring-2009, Spring-2016 (with Dr. V. Kanhangad).
2. Time-Frequency Analysis (PG, EE 701, Elective), Spring-2009, Autumn-2010, Spring-2011, Autumn-2012, Autumn-2013, Autumn-2014, Autumn-2015, Autumn-2016, Autumn-2017, Autumn-2018, Autumn-2019, Autumn-2019, Autumn-2020.
3. Soft Computing Techniques (PG, EE 604), Spring-2014, Spring-2018 (CS 401/601: Soft Computing), Spring-2019.
4. Advanced Signal Processing (PG, EE 641), Autumn-2011.
5. Basic Electronics and Electrical Engineering (UG, EE 104), Autumn-2010, Autumn-2019 (with Dr. V. Kanhangad, Dr. P.K. Upadhyay, Dr. T. Jain, and Dr. S.K. Vishvakarma).
6. Basic Electronics and Electrical Engineering Lab (UG, EE 154), Autumn-2010.
7. Signals and Systems (UG, EC 3105) and (UG, EE 202), Autumn-2008 (with Prof. J. Sivaswamy), Autumn-2009, Spring-2011, Spring-2012, Spring-2013, Spring-2014, Spring-2015, Spring-2017, Spring-2018, Spring-2019 (with Dr. A.K. Singh), Spring-2020 (with Dr. S. Vasudevan), Spring-2021 (with Dr. S. Vasudevan).
8. Introduction to Electrical and Electronic Circuits (UG, EE 102), Spring-2010 (with Dr. A.C. Umarikar).
9. Communication Systems (UG, EE 307), Autumn-2011, Autumn-2012, Autumn-2013, Autumn-2014, Autumn-2015 (with Prof. V. Bhatia), Autumn-2020 (with Prof. V. Bhatia).
10. Experimental Engineering Lab (UG, IC 211), Autumn-2011 (with Dr. R. Kumar, Dr. A. Kumar, and Dr. S.K. Vishvakarma).
11. Communications Lab (UG, EE 356), Spring-2012, Spring-2013 (with Dr. V. Kanhangad), Spring-2017 (with Dr. V. Kanhangad and Dr. P.K. Upadhyay).
12. Speech Signal Processing (PG, EE 740), Spring-2015, Spring-2020, Spring-2021.

13. Wireless Communication (PG, EE 642), Spring-2016 (with Dr. P.K. Upadhyay).

14. Image Processing (PG, EE 644), Spring-2017 (with Dr. V. Kanhangad).

**Post-Doctoral Research/Research Associate/Senior Research Fellow Supervision:**

1. Manish Sharma, Automated classification of biomedical signals based on time-frequency localized wavelet filter banks, December 2015-December 2016 (Post-doctoral fellow).
2. Vipin Gupta, Development of new methodologies for analysis and classification of epileptic seizure EEG signals (CSIR project), June 2016-December 2018 (Research associate).
3. Aditya Nalwaya, Automated classification system for human emotions based on physiological signals (CSIR project), March 2021-present (Senior Research Fellow).

**Ph. D. Thesis Supervision:**

**Completed:**

1. Varun Bajaj, Analysis and classification of EEG signals using novel features based on non-stationary signal decompositions, February 2014.
2. Pooja Jain, Noise resilient speech signal analysis using non-stationary signal processing techniques, April 2015.
3. Shivnarayan Patidar, Tunable-Q wavelet transform based methodologies for analysis and classification of cardiac signals, May 2015.
4. Rajeev Sharma, Automated identification systems based on advanced signal processing techniques applied on EEG signals, February 2017.
5. Dinesh Bhati, Design of time-frequency localized three-band wavelet filter banks and applications in EEG signal analysis, February 2017. (at IIT Bombay, with Prof. V.M. Gadre).
6. Abhay Upadhyay, New methods based on variational mode decomposition for speech signal analysis, November 2017.
7. Abhijit Bhattacharyya, Advanced wavelet transforms based EEG signal processing methods for epilepsy diagnosis, October 2018.
8. Rishi Raj Sharma, Non-stationary signal processing techniques based on eigenvalue decomposition of Hankel matrix, November 2018.
9. Mohit Kumar, Automated diagnosis methods for heart diseases using flexible analytic wavelet transform, February 2019.
10. Anurag Nishad, Tunable-Q wavelet transform based filter banks for non-stationary signals analysis and classification, July 2019.
11. Shishir Maheshwari, Advanced image analysis techniques for automated glaucoma diagnosis using retinal fundus images. (with Dr. V. Kanhangad), July 2020.
12. Rahul Sharma, Biomedical signal processing using higher order statistics. (at IIT Kanpur, with Prof. P. Sircar), September 2020.

**In Progress:**

1. Vipin Gupta, Fourier-Bessel domain based new methods for automated classification of EEG signals.
2. Pradeep Chaudhary, New two-dimensional signal decomposition approaches for analysis and classification of medical images.
3. Vivek Kumar Singh, Improved eigenvalue decomposition for non-stationary signal analysis.
4. Kritiprasanna Das, Multivariate non-stationary signal analysis techniques for biomedical applications.
5. Shailesh Bhalerao, Automated diagnosis methods for human brain diseases.

6. Makam Kiran Kumar, Electroencephalogram signals processing.
7. Amrit Panda, Hyperspectral image processing for biomedical applications. (with Dr. Neeta Devi Sinnappah-Kang, Christian Medical College Ludhiana, India)
8. Akanksha Tiwari, Cognitive Rehabilitation based on micro spatial parameters of video games. (with Dr. Sanjram Premjit Khanganba, IIT Indore).
9. Dada Saheb Ramteke, Gear fault diagnosis based on advanced signal processing techniques. (with Prof. Anand Parey, IIT Indore).
10. Arti Anuragi, Improving automated analysis and leaning of EEG signals for brain disorders detection using Fourier-Bessel series expansion based empirical wavelet transform. (at NIT Raipur, with Dr. Dilip Singh Sisodia).
11. Yamalakonda Venu Gopal, Estimation and filtering for dynamic control system. (with Dr. Abhinoy Kumar Singh, IIT Indore).

#### **M. Tech. Thesis Supervision:**

##### **Completed:**

1. Ashish Patwari, A proportional fair scheduling algorithm for cooperative transmission in OFDMA networks, July 2009. (at IIIT Hyderabad with Dr. R. Govindarajulu, Dr. S. Kalyanasundaram, and Mr. N. Balamurli)
2. V. Hari Rohit, Performance analysis of resource allocation types in LTE, July 2009. (at IIIT Hyderabad with Dr. R. Govindarajulu, Dr. S. Kalyanasundaram, and Mr. V. Kamble)
3. Omkishor Sahu, Automated classification of magnetic resonance brain images using bi-dimensional empirical mode decomposition, June 2015. (with Dr. V. Kanhangad)
4. Aswani Kumar Tiwari, Retinal blood vessel image segmentation and classification of epileptic seizure EEG signals for computer-aided diagnosis, June 2016. (with Dr. V. Kanhangad)
5. Satyartha Sharma, Detection of atrial fibrillation in electrocardiogram signals using tunable-Q wavelet transform, June 2016.
6. Surabhi Sood, Analysis and development of integrated index for diagnosis of coronary artery disease based on heart rate signals, June 2016.
7. Kapil Swarnkar, Classification of focal and non-focal electroencephalogram signals using recurrence plot method, June 2016.
8. Ashish Kumar, Automated detection of congestive heart failure based on the eigenvalue decomposition of HRV signals, June 2017.
9. Avinash Kalyani, Cross-terms free time-frequency representation using empirical wavelet transform and Wigner-Ville distribution, June 2018.
10. Lokesh Singh, Improved empirical wavelet transform for non-stationary signal analysis using Fourier-Bessel series expansion, July 2018.
11. Pratishtha Chandra, Eigenvalue decomposition based analysis and classification for electromyogram signals, July 2018.
12. Puneet Jain, New approaches for speech enhancement based on variational mode decomposition and iterative filtering with applications of subspace approach, July 2018. (with Dr. S.K. Vishvakarma).
13. Piyush Varshney, Iterative filtering based automated detection of epileptic seizure EEG signals, July 2018. (with Dr. S.K. Vishvakarma).
14. Preeti Meena, Reduction of cross terms in Wigner-Ville distribution using variational mode decomposition, July 2019.
15. Rajat Katiyar, Determination of respiratory and heart rates from PPG signals using FBSE-EWT method, July 2019.

16. Richa Singh, Automated classification system for normal and ALS EMG signals based on iterative filtering, July 2019.
17. Manoj Tripathi, EEG based automated identification of schizophrenia from FBSE-EWT technique, June 2020.
18. Rishita Sharma, Windowed FBSE-EWT method for non-stationary signal analysis, June 2020.
19. Borra Jeevan Teja, Automated method based on TQWT for the classification of alcoholism using EEG signals, June 2020.
20. Muktagucha Naga Viswanath, Automated sleep apnea detection from ECG signals based on flexible analytic wavelet transform, June 2020.

## **B. Tech. Project Supervision:**

### **Completed:**

1. Ronak Bajaj, Fourier-Bessel expansion based features for speaker identification, November 2009. (at IIIT Hyderabad with Prof. R.N. Biswas)
2. Saransh Chhabra, Fourier-Bessel expansion based features for speaker identification, November 2009. (at IIIT Hyderabad with Prof. R.N. Biswas)
3. Anamika Patel, Emotion recognition using EEG signals, May 2013.
4. Varun Joshi, Applications of fractional calculus in signal processing, May 2013. (with Dr. A. Vijesh)
5. Aakash Gupta, Vehicle license plate recognition, May 2013. (with Dr. R. Bodade)
6. Deepak Yadav, Vehicle license plate recognition, May 2013. (with Dr. R. Bodade)
7. Pritesh Kanani, Vehicle license plate recognition, May 2013. (with Dr. R. Bodade)
8. Suhani, Classification of normal, seizure, and seizure-free EEG signals, May 2014.
9. Manila Chaudhary, Classification of normal, seizure, and seizure-free EEG signals, May 2014.
10. Sachin Londhe, Detection of human emotions based on EEG and ECG signals, May 2014.
11. Kishan Soni, Detection of human emotions based on EEG and ECG signals, May 2014.
12. Abhishek Kumar, Detection of human emotions based on EEG and ECG signals, May 2014.
13. Arvind Kumar Meena, Determination of instantaneous fundamental frequency from speech signals, May 2014.
14. Devendra Kumar Meena, Determination of instantaneous fundamental frequency from speech signals, May 2014.
15. Vimal Kumar Meena, Image enhancement using various filtering techniques, May 2014. (with Dr. A. Vijesh)
16. Sanjay Kumar Meena, Comparison study of image enhancement techniques, May 2014. (with Dr. A. Vijesh)
17. Rahul Shivaji Pawar, Design of adaptive doppler filter bank for ground based radars, May 2014.
18. Harish Padigala, Singular value decomposition based method for AM-FM signal enhancement, May 2014.
19. Pakala Avinash, Classification of normal and diabetic RR interval signals using empirical mode decomposition, May 2015.
20. Kora Shashank, Classification of normal and diabetic RR interval signals using empirical mode decomposition, May 2015.
21. Shah Meet akshaykumar, Classification of epileptic seizure EEG signals using reconstructed phase space of intrinsic mode functions, May 2015.

22. Sumit Saurav, Classification of epileptic seizure EEG signals using reconstructed phase space of intrinsic mode functions, May 2015.
23. Archit Mathur, Detection of glottal closure instants from voiced speech signals using the Fourier-Bessel series expansion, May 2015.
24. Naveen Chaudhary, Detection of glottal closure instants from voiced speech signals using the Fourier-Bessel series expansion, May 2015.
25. Abhinav Tripathi, Automated classification of abnormal EMG signals using tunable-Q wavelet transform, December 2016.
26. Dhaivat Janmejy Joshi, Automated classification of abnormal EMG signals using tunable-Q wavelet transform, December 2016.
27. Tanvi Priya, Computer-aided detection of non-focal and focal EEG signals using flexible analytic wavelet transform, December 2016.
28. Abhishek Kumar Yadav, Computer-aided detection of non-focal and focal EEG signals using flexible analytic wavelet transform, December 2016.
29. Swastik Gupta, Automated classification of focal and non-focal EEG signals using Fourier-Bessel series expansion, December 2017. (with Dr. M. Tanveer).
30. Konduri Hari Krishna, Automated classification of focal and non-focal EEG signals using Fourier-Bessel series expansion, December 2017. (with Dr. M. Tanveer).
31. Addepalli Hari Narayana, Infrared image processing for IoT module using NIR spectroscopy, December 2017. (with Mr. Pravin Kumar Angolkar, Analog Devices India Pvt. Ltd., Bangalore).
32. Anmol Mansingh, Automated screening of sleep apnea from ECG signals using digital Taylor-Fourier transform, December 2018.
33. Banka Nithin, Automated screening of sleep apnea from ECG signals using digital Taylor-Fourier transform, December 2018.
34. Mayur Dahyabhai Chopda, Automated identification of human emotions based on non-stationary EEG signal processing, December 2018.
35. Himali Singh, Sliding-mode singular spectrum analysis for sleep apnea detection using ECG signals, December 2019.
36. Anmay Kumar, Fundamental frequency determination for speech signals of Vedic mantras, December 2019.
37. Pankaj Verma, Study on effects of chanting on EEG signal rhythms, December 2019.
38. Chethan N., Pitch frequency determination from speech signals based on FBSE-EWT method, May 2021.
39. Abhishek Vashishtha, Singular spectrum analysis for automated detection of epilepsy using EEG signals, May 2021.
40. Varun Patil, FAWT based automated detection of sleep apnea using EEG signals, May 2021.
41. Sonu Yadav, Automated classification of normal and glaucoma fundus images using EWT method, May 2021.

**In Progress:**

1. Aahan Tyagi, New FBSE-EWT based time-frequency analysis techniques.

**Awards & Honors:**

1. Post-doctoral fellowship at Charles Delaunay Institute, University of Technology of Troyes, Troyes, France, for a period of one year (2007-2008). (Awarded by Champagne-Ardenne Regional Council, France).
2. Appreciation certificate from the Head of Department, Electrical Engineering, Indian Institute of Technology Kanpur, Kanpur, India, for excellent services in short term course on Application of Matlab in Engineering, 2006.

3. Appreciation certificate from the Head of Department, Information Technology, Government Engineering College Raipur, India for excellent services in Workshop on Scientific and Engineering Applications of Matlab, 2005.
4. A certificate, National Cadet Corps (NCC), 1994.
5. Cash award for the paper published in Digital Signal Processing (Journal of Elsevier Science), from Dean Resources Planning and Generation, Indian Institute of Technology Kanpur, Kanpur, India, 2007.
6. Travel grant, Council of Scientific & Industrial Research (CSIR) for attending the IEEE DSP workshop, 2006.
7. Travel grant, Centre for Cooperation in Science and Technology among Developing Societies (CSTDS) for attending the EUSIPCO conference, 2008.
8. Travel grant, Department of Science and Technology (DST) for attending the EUSIPCO conference, 2008.
9. Travel grant, Council of Scientific & Industrial Research (CSIR) for attending the IEEE ISSPA Conference, 2010.
10. Achievement award, 5th Indian International Conference on Artificial Intelligence (IICAI-11), December, 2011.
11. Inclusion in Marquis Who's Who Publications for the year 2012.
12. Best paper award, International Conference on Convergence and Hybrid Information Technology, Daejeon, South Korea, 2012.
13. Visiting Scholar at Ulster University, Northern Ireland, UK, 2014. (Invited by Prof. Girijesh Prasad).
14. Best research paper award, Indian Institute of Technology Indore, Indore, India, 2015.
15. Excellent grade, Department of Science and Technology (DST) Expert Committee in the review of the DST sponsored project, May, 2014.
16. Travel grant, Department of Science and Technology (DST) for attending the IEEE Signal Processing and Signal Processing Education workshop, 2015.
17. Certificate of outstanding contribution in reviewing, September, 2014, Biomedical Signal Processing and Control Journal (Elsevier), June 2015.
18. Inclusion of research paper in best research papers of year 2014, Computer Methods and Programs in Biomedicine Journal (Elsevier), 2015.
19. Selection of research paper as featured paper, Entropy Journal, 2015.
20. Best research paper award, Indian Institute of Technology Indore, Indore, India, 2016.
21. Top social media article in the list of 2017 articles (Knowledge-Based Systems Journal).
22. Conference grant, CSIR for International Conference on Machine Intelligence and Signal Processing (MISP 2017), 22-24 December, 2017, IIT Indore.
23. Conference grant, DST for International Conference on Machine Intelligence and Signal Processing (MISP 2017), 22-24 December, 2017, IIT Indore.
24. Visiting Professor at School of Medicine, Faculty of Health and Medical Sciences, Taylor's University, Subang Jaya, Malaysia, from December 2018 to November 2019.
25. Appreciation certificate from the Department of Electronics and Communication Engineering, Lakshmi Narayan College of Technology, Indore, India for delivering keynote talk in National Conference on Emerging Trends and Research in Electronics & Communication Engineering-2018, 26-27 November, 2018.
26. Appreciation certificate from the IEEE BITS Pilani K.K. Birla Goa Campus, Goa, India for sharing expertise and experience at LUMINI 2019, 15<sup>th</sup> September, 2019.
27. 2019 Premium Award for Best Paper in IET Science, Measurement & Technology journal, November 2019.

28. Appreciation certificate from the Chairman, IEEE Kharagpur Section, IIT Kharagpur for making a presentation under IEEE Lecture Series at IEEE Kharagpur Section, 27 January, 2020.
29. Certificate of appreciation from the Faculty of Information & Communication Technology, University of Malta, Valletta, Malta for imparting valuable insights and inspiration for the teachers, students and researchers during the 2020 4<sup>th</sup> International Conference on Advances in Computing and Data Sciences (ICACDS-2020) during April 24-25, 2020.
30. Inclusion in the list of top scientists in the area of Computer Science and Electronics at the Guide2Research (<http://www.guide2research.com/scientists/IN>), April 2020.
31. Listed in the world's top 2% scientists in the study carried out by Prof. John Loannidis and others at Stanford University, USA ((<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000918>), October 2020.
32. 2020 Premium Award for Best Paper in IET Science, Measurement & Technology journal, December 2020.
33. Certificate of appreciation from NIT Silchar for the time and efforts as a valued International Advisory Committee Member in IEEE International Conference on Advanced Communication Technologies and Signal Processing (IEEE ACTS-2020), 04-06 December, 2020.
34. Certificate of appreciation form IEEE Signal Processing Society, Gujarat Chapter for delivering a keynote talk during an International e-Conference on Intelligent Systems and Signal Processing (e-ISSP 2020) organized by Electronics & Communication Engineering Department of GH Patel College of Engineering & Technology, Vallabh Vidyanagar, India, 28-30 December, 2020.

#### **Professional Activities:**

##### **Professional Affiliation:**

1. Senior Member, the Institute of Electrical and Electronic Engineers (IEEE), Membership number: 92164938, since 11 July, 2016.
2. Fellow, the Institution of Electronics and Telecommunication Engineers (IETE), Membership number: F-234608, since 22 July 2017.
3. ACM Professional Member, Membership number: 8354810, since 22 May, 2020.
4. Fellow of Institution of Engineering and Technology (IET), Membership number: 1100759368, since 17 June, 2020.

##### **Reviewer in National and International Conferences:**

1. 10<sup>th</sup> International Conference on Soft Computing for Problem Solving (SocPros 2020), IIT Indore, Indore, India, July 29-31, 2020.
2. International Conference on Signal Processing and Communications (SPCOM-2020), 20-23 July, 2020, Bengaluru, India.
3. INDICON 2019, 13-15 December, 2019, Marwadi University, Rajkot, Gujarat, India.
4. Third International Conference on Computing and Network Communications (CoCoNet'19), 18-21 December, 2019, Trivandrum, Kerala, India.
5. National Conference on Communications (NCC), 20-23 February, 2019, Bangalore, India.
6. International Conference on Signal Processing and Communications (SPCOM), 16-19 July, 2018, Bangalore, India.
7. National Conference on Communications (NCC), 25-28 February, 2018, Hyderabad, India.
8. National Conference on Communications (NCC), 02-04 March, 2017, Chennai, India.
9. National Conference on Communications (NCC), 04-06 March, 2016, Guwahati, India.
10. National Conference on Communications (NCC), 27 February-01 March, 2015, Bombay, India.
11. National Conference on Communications (NCC), 28 February-2 March, 2014, Kanpur, India.

12. National Conference on Communications (NCC), 26-28 January, 2007, Kanpur, India.
13. National Conference on Communications (NCC), 01-03 February, 2008, Mumbai, India.
14. European Signal Processing Conference (EUSIPCO), 25-29 August, 2008, Lausanne, Switzerland.
15. European Signal Processing Conference (EUSIPCO), 24-28 August, 2009, Glasgow, Scotland.
16. IEEE Tencon, 19-21 November, 2008, Hyderabad, India.
17. Indian International Conference on Artificial Intelligence (IICAI), 16-18 December, 2009, Tumkur, India.
18. The 2nd International Symposium on Optical Engineering and Photonic Technology (OEPT), 29 June–2 July, 2010, Orlando, Florida, USA.
19. IEEE Indicon, 18-20 December, 2009, Gandhinagar, India.
20. IEEE Symposium on Industrial Electronics & Applications (ISIEA), 03-06 October, 2010, Penang, Malaysia.
21. The First International conference on Power, Control and Embedded Systems (ICPCES), 08-10 December, Chennai, India.
22. IEEE International Conference on Electronic Devices, Systems & Applications (ICEDSA), 25-27 April, 2011, Kuala Lumpur, Malaysia.
23. National Conference on Communications (NCC), 28-30 January, 2011, Bangalore, India.
24. International Conference on Logic, Information, Control and Computation (ICLIICC), 25-26 February, 2011, Gandhigram, Tamil Nadu, India.
25. IEEE Symposium on Industrial Electronics & Applications (ISIEA), 25-28 September, 2011, Langkawi, Malaysia.
26. Indian International Conference on Artificial Intelligence (IICAI), 14-16 December, 2011, Tumkur, India.
27. International Conference on Signal, Image and Video Processing, 13-15 January, 2012, Patna, India.
28. Annual IEEE India Conference (IEEE INDICON), 13-15 December, 2013, Bombay, India.
29. WSEAS Conferences

**Reviewer in National and International Journals:**

1. IEEE Transactions on Information Technology in Biomedicine
2. IEEE Journal of Biomedical and Health Informatics
3. IEEE Transactions on Biomedical Engineering
4. IEEE Sensors Journal
5. IEEE Transactions on Geoscience and Remote Sensing
6. WSEAS Journals
7. IETE Technical Review Journal
8. Circuits, Systems and Signal Processing
9. Signal Processing
10. Mechanical Systems and Signal Processing
11. Digital Signal Processing
12. EURASIP Journal on Advances in Signal Processing



13. Journal of Computational Science
14. Journal of Visual Communication and Image Representation
15. Neural Computing and Applications
16. European Transactions on Telecommunications
17. Applied Mathematics and Computation
18. Measurement
19. International Journal of Adaptive Control and Signal Processing
20. Circuits and Systems
21. Journal of Signal and Information Processing
22. Computers in Biology and Medicine
23. Biomedical Engineering Letters
24. Optics & Laser Technology
25. The Scientific World Journal
26. Expert Systems with Applications
27. Journal of Medical Imaging and Health Informatics
28. IEEE Transactions on Neural Systems & Rehabilitation Engineering
29. IEEE Transactions on Neural Networks and Learning Systems
30. SpringerPlus
31. IEEE Transactions on Signal Processing
32. IET Science, Measurement & Technology
33. Neurocomputing
34. Journal of the Franklin Institute
35. IET Signal Processing
36. Electronics Letters
37. Medical Engineering and Physics
38. Pattern Recognition Letters
39. IEEE Signal Processing Letters
40. Medical & Biological Engineering & Computing
41. Computers and Electrical Engineering
42. Biomedical Engineering/Biomedizinische Technik
43. Information Sciences
44. IEEE Transactions on Cybernetics
45. Computational and Mathematical Methods in Medicine
46. Ain Shams Engineering Journal

47. IEEE Transactions on Very Large Scale Integration Systems
48. IEEE Access
49. Heliyon
50. Mobile Information Systems
51. Entropy
52. Biocybernetics and Biomedical Engineering
53. IEEE Transactions on Fuzzy Systems
54. Journal of Intelligent Systems
55. Computer Methods in Biomechanics and Biomedical Engineering
56. Computational Intelligence and Neuroscience
57. Informatics in Medical Unlocked
58. Computerized Medical Imaging and Graphics
59. Waves in Random and Complex Media
60. IEEE Journal of Translational Engineering in Health and Medicine
61. International Journal of Biomedical Imaging
62. IETE Journal of Research
63. Speech Communication
64. Shock and Vibration
65. International Journal of Electronics and Communication
66. Journal of Healthcare Engineering
67. Royal Society Open Science
68. Computerized Medical Imaging and Graphics
69. IEEE Transactions on Medical Imaging
70. Artificial Intelligence Review
71. Mathematical Problems in Engineering
72. IEEE Transactions on Plasma Science
73. International Journal of Applied and Computational Mathematics
74. Journal of Experimental & Theoretical Artificial Intelligence
75. Pattern Recognition
76. Chemometrics and Intelligent Laboratory Systems
77. Neuroscience Letters
78. Discrete Applied Mathematics
79. Sleep and Vigilance
80. Journal of King Saud University-Computer and Information Sciences

81. International Transactions on Electrical Energy Systems
82. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences
83. Journal of Ocean Engineering and Science
84. Computers and Electronics in Agriculture
85. Journal of Biomedical Research
86. Cognitive Systems Research
87. Proceedings of the National Academy of Sciences, India Section A: Physical Sciences
88. Frontiers in Neuroinformatics
89. International Journal of Automation and Computing
90. Signal Processing: Image Communication
91. IEEE Sensors Letters
92. IEEE Journal of Selected Topics in Signal Processing
93. ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)
94. Applied Computing and Informatics
95. IEEE Geoscience and Remote Sensing Letters
96. IEEE Transactions on Industrial Electronics
97. Multimedia Tools and Applications
98. Part H: Journal of Engineering in Medicine
99. IEEE Transactions on Circuits and Systems II: Express Briefs
100. Frontiers in Neuroscience
101. IEEE Transactions on Systems, Man and Cybernetics: Systems
102. Scientific Reports
103. International Journal of Imaging Systems and Technology
104. Neural Networks

**Technical Program Committee Member:**

1. IEEE Tencon, 19-21 November, 2008, Hyderabad, India.
2. Indian International Conference on Artificial Intelligence (IICAI), 16-18 December, 2009, Tumkur, India.
3. IEEE Symposium on Industrial Electronics & Applications (ISIEA), 03-06 October, 2010, Penang, Malaysia.
4. IEEE International Conference on Electronic Devices, Systems & Applications (ICEDSA), 25-27 April, 2011, Kuala Lumpur, Malaysia.
5. Indian International Conference on Artificial Intelligence (IICAI), 14-16 December, 2011, Tumkur, India.
6. International Conference on Signal, Image and Video Processing, 13-15 January, 2012, Patna, India.
7. National Conference on Communications (NCC), 28 February-2 March, 2014, Kanpur, India.
8. IEEE International Conference on Medical Biometrics, 30 May-01 June, 2014, Shenzhen, China.

9. National Conference on Communications (NCC), 27 February-01 March, 2015, Bombay, India.
10. National Conference on Communications (NCC), 4-6 March, 2016, Guwahati, India.
11. National Conference on Communications (NCC), 2-4 March, 2017, Chennai, India.
12. National Conference on Communications (NCC), 25-28 February, 2018, Hyderabad, India.
13. National Conference on Recent Innovations in Electronics and Communication Technology, 02-04 March, 2017, Varanasi, India.
14. International Conference on Biomedical Engineering (ICoBE 2017), 21-22 August, 2017, Penang, Malaysia.
15. National Conference on Recent Trends in Biomedical Engineering (NCRTBME), 24-25 August, 2017, Chennai, India.
16. National Conference on Emerging Trends in Signal Processing and VLSI Design (NC-SPVD'16), 28th December, 2016, Punalkulam, India.
17. National Conference on Recent Research Trends in Electronics and Communication Engineering (RRTECE 2017), 03-05 March, 2017, Varanasi, India.
18. International Conference on VLSI, Communication and Signal Processing (VCAS 2018), 29 November-01 December, 2018, Allahabad, India.
19. IEEE International Conference on Innovations in Electronics, Signal Processing and Communication, 01-02 March, 2019, NIT Meghalaya, Shilong,
20. National Conference on Communications (NCC), 20-23 February, 2019, Bangalore, India.
21. 2019 International Conference on Artificial Intelligence and Computer Science (AICS 2019), 12-13 July, 2019, Wuhan, Hubei, China.
22. 1<sup>st</sup> International Conference on Machine Learning, Image Processing, Network Security and Data Sciences, 03-04 March, 2019, NIT Kurukshetra, India.
23. 2019 Fifth International Conference on Image Information Processing (ICIIP), 15-17 November, 2019, Jaypee University of Information Technology, Shimla, India.
24. 4<sup>th</sup> IEEE International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques (ICECCOT-2018), 13-14 December, 2019, Mysuru, India.
25. 2nd International Conference on VLSI, Communication, and Signal Processing (VCAS 2019), 21-23 October, 2019, MNNIT Allahabad, Prayagraj, India.
26. 2019 International Conference on Artificial Intelligence and Computer Science (AICS2019), 12-13 July, 2019, Wuhan, Hubei, China.
27. International Conference on Machine Intelligence and Signal Processing, 07-10 September, 2019, IIIT Allahabad, Prayagraj, India.
28. 2019 International Conference on Biomedical Engineering (ICoBE 2019), 26-27 August, 2019, Penang, Malaysia.
29. Third International Conference on Computing and Network Communications (CoCoNet'19), 18-21 December, 2019, Trivandrum, Kerala, India.
30. 9th International Conference on Communication Systems and Network Technologies 2020 (CSNT 2020), 10-12 April, 2020, Gwalior, India.
31. Twenty Sixth National Conference on Communications (NCC), 21-23 February, 2020, IIT Kharagpur, India.
32. 7<sup>th</sup> Symposium on Control, Automation, Industrial Informatics and Smart Grid (ICAIS'19), 18-21 December, 2019, Trivandrum, Kerala, India.
33. International Conference on Data Science and Business Informatics (ICDSBI) 2020, 17-19 April, 2020, Bangalore, India.

34. International Conference on Contemporary Computing and Applications (ICCCA 2020), 05-07 February, 2020, Lucknow, India.
35. International Conference on Signal Processing and Communications (SPCOM 2020), 20-23 June, 2020, Indian Institute of Science, Bengaluru, India.
36. International Conference on Computer Vision, High Performance Computing, Smart Devices and Networks (CHSN2020), Jawaharlal Nehru Technological University Kakinada (JNTUK), Andhra Pradesh, India, 09-10 May, 2020.
37. 10<sup>th</sup> International Conference on Soft Computing for Problem Solving (SocPros 2020), IIT Indore, Indore, India, 29-31 July, 2020.
38. 3rd International Conference on VLSI, Communication, and Signal Processing (VCAS 2020), 09-11 October, 2020, MNNIT Allahabad, Prayagraj, India.
39. 9th IEEE International Conference on Communication, Networks and Satellite (IEEE COMNETSAT 2020), Batam, Indonesia, 17-18 December, 2020.
40. International Conference on Biomedical Engineering and Software Technology (BEST 2021), NIT Raipur, 28-29 January, 2021.
41. Twenty Seventh National Conference on Communications (NCC), 27-30 May, 2021, Kanpur, India.
42. 7th International Conference on Signal Processing and Communication (ICSC 2021), Department of Electronics and Communication Engineering, Jaypee Institute of Information Technology, Noida, India, 25-27 November, 2021.
43. Fourth International Conference on VLSI, Communication, and Signal Processing (VCAS 2021); from September 24, 2021 to September 26, 2021, MNNIT Allahabad, Prayagraj, India.

**Advisory Committee Member:**

1. International Conference on Emerging Trends in Signal Processing and VLSI Design, Hyderabad, India, June 2010.
2. National Conference on Recent Advances in Science, Engineering and Management, Hyderabad, India, April 2013.
3. International Conference on Computational Mathematics in Nanoelectronics and Astrophysics, Indore, India, 1-3 November, 2018.
4. International Conference on Mathematical Modelling and Scientific Computing, Indore, India, 19-21 July, 2018.
5. IEEE International Conference on Recent Advances in Engineering, Technology and Computational Sciences-2018 (RAETCS-2018), 06-08 February, 2018, Allahabad, India.
6. National Conference on Recent Trends in Biomedical Engineering (NCRTBME 2017), Department of Biomedical Engineering, SRM University, Chennai, 23-24 August, 2017, India.
7. International Symposium on Intelligent Sensing Systems-2017 (ISISS 2017), 14-16 November, 2017, Guntur, India.
8. International Symposium on Water: Resources, Challenges & Sustainability (WRCS-2018), 10 March, 2018, IIT Indore, India.
9. IEEE International Conference on Recent Advances in Engineering, Technology and Computational Sciences- 2018 (RAETCS-2018), Allahabad, India, 06-08 February, 2018.
10. 2016 Second International Conference on Computational Intelligence & Communication Technology (CICT), Ghaziabad, India, 12-13 February, 2016.
11. Symposium on Emerging Areas in Biosciences and Biomedical Technologies (eBBT-2018), 05-06 January, 2018, Indore, India.

12. International Conference on Recent Advances in Interdisciplinary Trends in Engineering and Applications, 14-16 February, 2019, Indore, India.
13. IEEE International Conference on Innovations in Electronics, Signal Processing and Communication, 01-02 March, 2019, NIT Meghalaya, Shilong, India.
14. International Conference on Advances and Challenges in Biomedical and Health Informatics research (ICOBHIR-2019), SRM Institute of Science and Technology (Kattankulathur Campus), Tamil Nadu, India. 28-29 March, 2019.
15. National Conference on Soft Computing and Intelligent Techniques in Science and Engineering (SCITSE-2017), 25 November, 2017, NIT Raipur, Raipur, India.
16. 3<sup>rd</sup> International Conference on Biomedical Engineering (ICOB E 2017), 21-22 August, 2017, Kuala Lumpur, Malaysia.
17. International Conference MESCoE 2017, 29-30 June, 2017, Pune, India.
18. International Conference on Biomedical Engineering (ICoBE 2019), 26-27 August, 2019, Penang, Malaysia.
19. International Conference on Power, Control and Communication Infrastructure (ICPCCI 2019), 4-5 July, 2019, IITRAM, Ahmedabad, India.
20. 4<sup>th</sup> IEEE International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques (ICEECCOT-2018), 13-14 December, 2019, Mysuru, India.
21. Machine Learning Techniques for Pattern Recognition and Information Security to be published by IGI Global, Editors: Ankit Kumar Jain and Mohit Dua, 2019.
22. International Conference on Innovative Engineering Design (ICIED-2020), The Institutions of Engineers (India), Uttarakhand State Centre, Dehradun, India, 18-19 January, 2020.
23. National Conference on Advances in Communication, Devices and Signal Processing (ACDSP 2020), School of Electronics Engineering, KIIT University, Odisha, India, 16 -18 October, 2020.
24. International Conference on Advanced Communication Technologies and Signal Processing (ACTS-2020), 22-24 May, 2020, Silchar, India.
25. International Conference on Technology, Research, and Innovation for Betterment of Society (TRIBES-2021), IIIT Naya Raipur, Chhattisgarh, India, 25-27 June, 2021.
26. 3<sup>rd</sup> IEEE International Conference on Signal Processing and Communication Engineering Systems (SPACES)-2021, 11-12 June, 2021, KL University, Guntur, India.
27. International Conference on Biomedical Engineering and Software Technology (BEST 2021), NIT Raipur, 28-29 Januray, 2021.
28. 7th International Conference on Signal Processing and Communication (ICSC 2021), Department of Electronics and Communication Engineering, Jaypee Institute of Information Technology, Noida, 25-27 November, 2021.
29. International Conference on “Advances in Signal Processing and Power Quality (ISSPQ-2022)”, Oriental Institute of Science & Technology (OIST), Bhopal, India, 11-12 Feb 2022.

#### **Ph.D. Thesis Examiner:**

1. Deepak Kumar Raghuvanshi, Characterization and performance evaluation of ultra wide band antenna for wireless communication system, Department of Electronics Engineering, Barkatullah University Institute of Technology (BUIIT), Bhopal, India, 2012.
2. Bharti Gupta, Design and development of compact wide band micro strip antenna, Department of Electronics and Communication Engineering, Maulana Azad National Institute of Technology, Bhopal, India, 2014.
3. Alpana Pandey, Analysis and design of an autonomous chaotic system with synchronization for secured communication, Department of Electronics and Communication Engineering, Maulana Azad National Institute of Technology, Bhopal, India, 2014.

4. Paawan Sharma, Estimation of reactor power from core temperature signal of fast reactor, Indira Gandhi Centre for Atomic Research, Kalpakkam, India, 2014.
5. Sanjay Kumar Jain, Detection and analysis of human body odour as an alternative biometrics, Department of Electronics and Communication Engineering, Maulana Azad National Institute of Technology, Bhopal, India, 2014.
6. Nagendra H., Evaluation of physiological parameters for cognitive performance, Department of Electrical Engineering, Indian Institute of Technology Roorkee, Roorkee, India, 2016.
7. Preetam Suman, Real time event recognition in the presence of forest clutter, Indian Institute of Information Technology, Allahabad, India, 2016.
8. Anurag Singh, Compressed sensing framework for multi-channel ECG signals, Department of Electronics and Electrical Engineering, Indian Institute of Technology Guwahati, Guwahati, India, 2017.
9. Rajib Sharma, Empirical mode decomposition for adaptive AM-FM analysis of speech, Department of Electronics and Electrical Engineering, Indian Institute of Technology Guwahati, Guwahati, India, 2017.
10. Ajay Kumar Maddirala, Efficient subspace based techniques for processing single channel electroencephalogram signals, Department of Electronics and Electrical Engineering, Indian Institute of Technology Guwahati, Guwahati, India, 2017.
11. Nagaraj Adiga, Glottal activity region based processing for speech synthesis, Department of Electronics and Electrical Engineering, Indian Institute of Technology Guwahati, Guwahati, India, 2017.
12. Shalini A. Rankawat, Signal processing methods for robust heart rate estimation from multimodal physiological signals, Dhirubhai Ambani Institute of Information and Communication Technology, Gandhinagar, India, 2017.
13. Dharmendra Sadhwani, SEP analysis of various digital modulation schemes over AWGN and fading channels, Department of Electronics and Communication Engineering, Maulana Azad National Institute of Technology, Bhopal, India, 2018.
14. Shailendra Singh Pawar, Design and optimization of non-cross feed microstrip log periodic dipole array antenna using particle swarm optimization, Department of Electronics and Communication Engineering, Maulana Azad National Institute of Technology, Bhopal, India, 2018.
15. Bhupendra Kumar Shukla, Design and fabrication of open slot antenna and wide slot antenna using different tuning stub and parasitic element, Department of Electronics and Communication Engineering, Maulana Azad National Institute of Technology, Bhopal, India, 2018.
16. Jiss J. Nallikuzhy, Spatial enhancement of ECG using transform domain models, Department of Electronics and Electrical Engineering, Indian Institute of Technology Guwahati, Guwahati, India, 2018.
17. Justin Joseph, Formulation and validation of adaptive and customized spatial transforms for restoration and contrast enhancement of MR images, Department of Biomedical Engineering, National Institute of Technology, Raipur, India, 2018.
18. Laxmi Shaw, Effect of meditative relaxation on connectivity of human brain- A study using EEG, Department of Electrical Engineering, Indian Institute of Technology Kharagpur, Kharagpur, India, 2018.
19. Mohammed Diykh, Developing new techniques to analyse and classify EEG signals, University of Southern Queensland, Australia, 2018.
20. Hemant Kumar Meena, Some studies on the facial expression recognition using the graph signal processing, Department of Electronics and Communication Engineering, Malaviya National Institute of Technology, Jaipur, India, 2018.
21. Pritash Tiwari, Design of high gain wideband microstrip H slot patch antenna, Department of Electronics and Communication Engineering, Maulana Azad National Institute of Technology, Bhopal, India, 2018.
22. Ranu Gupta, Secured system with pattern recognition for biomedical images, Jaypee University of Engineering & Technology, Guna, India, 2018.
23. Mukesh Tiwari, An efficient algorithm for tracking of object in video camera networks, Rajiv Gandhi Technological University, Bhopal, India, 2018.

24. Abhishek Kashyap, Image forgery detection, Jaypee Institute of Information Technology, Noida, India, 2018.
25. Lingraj Dora, Medical image analysis using soft computing techniques, Veer Surendra Sai University of Technology, Burla, India, December 2018.
26. M. Sreenivasa Rao, Design of random modulator pre integrator (RMPI) for EW applications, Defence Institute of Advanced Technology (Deemed University), Girinagar, Pune, India, January 2019.
27. Neeti Singh, New algorithms for detection and fuzzy filtering of high density random valued impulse noise in images, Faculty of Information and Communication Engineering, Anna University, Chennai, India, February 2019.
28. Deepak Ranjan Nayak, Towards designing improved pathological brain detection system using machine learning approaches, National Institute of Technology, Rourkela, India, February 2019.
29. Devendra Kumar Yadav, Some studies on Ramanujan sums, Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi, India, February 2019.
30. Deepak Singh, Investigation of evolutionary intelligence on discriminative learning with variant and invariant data, Department of Computer Science and Engineering, National Institute of Technology Raipur, Raipur, India, March 2019.
31. Paramkusham Spandana, A novel approach for classification and early detection of breast cancer using image enhancement, image segmentation and feature extraction of mammograms, Birla Institute of Technology and Science, Pilani, India, April 2019.
32. Ramesh Kumar Bhukya, Approaches for robust text-dependent speaker verification under degraded conditions, Department of Electronics and Electrical Engineering, Indian Institute of Technology Guwahati, Guwahati, India, May 2019.
33. Ripul Ghosh, Time-frequency distributions for target detection and recognition in seismic and acoustic signals, Central Scientific Instruments Organization, Council of Scientific and Industrial Research, Chandigarh, India, June 2019.
34. B. Prabhakar, Development of computationally efficient block matching motion estimation algorithms for video coding in wireless communication, Directorate of Research and Development, Jawaharlal Nehru Technological University Hyderabad, Hyderabad, India, June 2019.
35. A. Srinivasan, Studies and analysis of brain MR images and classification for detection of some neurodegenerative diseases, Department of Computer Science & Engineering, National Institute of Technology, Durgapur, India, June 2019.
36. Songhita Misra, Design and development of virtual text-entry interface system based on dynamic hand gestures, Department of Electronics and Communication Engineering, National Institute of Technology Silchar, Silchar, India, July 2019.
37. Jayesh Gangrade, Real time vision-based indian sign language recognition using depth sensor, Department of Computer Science & Engineering, Maulana Azad National Institute of Technology, Bhopal, India, July 2019.
38. M. Vishwanath Shervegar, Heart sound analysis and classification, Electronics & Communication Engineering, Visvesvaraya Technological University, Belgaum, Karnataka, July 2019.
39. Neha Singh, Development of signal processing techniques for enhancement of energy concentration in time-frequency representation of S-transform, Department of Electronics and Communication Engineering, Indian Institute of Technology Roorkee, Roorkee, India, September 2019.
40. Kaushik Bakshi, Constraint-free hand motion detection and intuitive control of upper limb prosthesis using physiological signals, Advanced Technology Development Center, Indian Institute of Technology Kharagpur, Kharagpur, India, September 2019.
41. Debdeep Sikdar, Nonlinear analysis of electroencephalogram for identifying vowel imagery, School of Medical Science & Technology Indian Institute of Technology Kharagpur, Kharagpur, India, September 2019.



42. Anshul Thakur, Automatic pattern analysis of bioacoustics signals: Exploring shallow and deep learning frameworks, School of Computing and Electrical Engineering, Indian Institute of Technology Mandi, Mandi, India, September 2019.
43. Tushar Chouhan, Networks-based brain computer interfaces for decoding neurophysiological dynamics, School of Computer Science and Engineering, Nanyang Technological University, Singapore, October 2019.
44. Shubhendu Kumar Sarangi, Design of digital filters using evolutionary computing techniques, Department of Electronics & Telecommunication Engineering, Veer Surendra Sai University of Technology Siddhi Vihar, Burla, Sambalpur, India, October 2019.
45. Figlu Mohanty, Towards development of computer-aided diagnosis frameworks for digital mammogram classification, Department of Computer Science and Engineering, International Institute of Information Technology, Bhubaneswar, India, December 2019.
46. Shefali Waldekar, A study on audio features for acoustic scene classification, Department of Electronics and Electrical Communication Engineering, Indian Institute of Technology Kharagpur, Kharagpur, India, December 2019.
47. Abha Jain, Architecture design of a flexible LDPC decoder for high throughput applications, Department of Electronics and Communication Engineering, University Institute of Technology, Rajiv Gandhi Proudlyogiki Vishwavidyalaya, Bhopal, India, January 2020.
48. Varun Gupta, Advanced techniques for feature extraction and intelligent analysis of ECG signals, Department of Electrical Engineering, National Institute of Technology Kurukshetra, India, January 2020.
49. Peeyush Sahay, Improved time-frequency approaches for characterization of multiple higher order chirp waveforms with applications in radar signal processing, Department of Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India, February 2020.
50. Anita Pankaj Patil, Enhancement of an echo cancellation method, Electronics & Communication Engineering, Visvesvaraya Technological University, Belagavi, Karnataka, February 2020.
51. Amandeep Cheema, Development of psychological stress detection system using bio-signals, Department of Electronics and Instrumentation Engineering, Thaper Institute of Engineering and Technology, Patiala, Punjab, India, March 2020.
52. Suvidha Tripathi, Histopathological image analysis using hybrid deep learning models, Department of Information Technology, Indian Institute of Information Technology, Allahabad, India, July 2020.
53. Pragyesh Kumar, Quantum inspired evolutionary algorithms for image and video watermarking, Computer Science, Dayalbagh Educational Institute, Dayalbagh, Agra, India, July 2020.
54. Deepasikha Mishra, Development of learning-based techniques for single-image super-resolution, Department of Computer Science and Engineering, National Institute of Technology Rourkela, Rourkela, India, October 2020.
55. Rajdeep Ghosh, Some studies on silent speech recognition from brain waves, Department of Computer Science and Engineering, National Institute of Technology Silchar, Silchar, India, October 2020.
56. P Chandra Shaker Reddy, Seasonal rainfall forecasting and crop yield management using machine learning techniques, Research and Development, Jawaharlal Nehru Technological University, Anantapur, Ananthapuramu, India, October 2020.
57. Angana Saikia, Study of functional and neuronal changes in early stages of Parkinson's disease using EEG in correlation with EMG, Department of Biomedical Engineering, North-Eastern Hill University, Shillong, India, October 2020.
58. Shakeel Ahmad Malik, Neuronal models: From dynamics to implementation, Department of Electronics and Communication Engineering, National Institute of Technology Srinagar, Srinagar, India, December 2020.
59. Sundara Krishnan K, An efficient novel secured symmetric key multiple color image encryption and compression scheme, Faculty of Information and Communication Engineering, Anna University, Chennai, December 2020.

60. Surekha Rani, Design of nanomaterial based microwave absorbers for antenna arrays, Department of Electronics and Communication Engineering Sant Longowal Institute of Engineering and Technology Longowal, India, February 2021.
61. Ugendhar Addagatla, Energy conservation and reliable routing protocol for mobile adhoc network, Faculty of Computer Science and Engineering, Directorate of Research and Development, Jawaharlal Nehru Technological University Hyderabad, Kukatpally, Hyderabad, India, February 2021.
62. Ambika P.S., Remaining useful life prediction of rolling element bearings using artificial intelligence, Department of Mechanical Engineering, National Institute of Technology Calicut, Kozhikode, India, February 2021.
63. Venugopal P, Design of a high speed and low power analog to digital converter using asynchrotronic threshold inverter quantization technique, Faculty of Information and Communication Engineering, Anna University, Chennai, India, February, 2021.
64. Saurabh Tewari, Assessment of machine learning models for reservoir characterization and drilling automation, Department of Petroleum Engineering & Geological Sciences, Rajiv Gandhi Institute of Petroleum Technology, Jais, India, March 2021.
65. Ashok Kumar, Advanced techniques for robust Hindi ASR, Department of Electronics and Communication Engineering, National Institute of Technology Kurukshetra, Kurukshetra, India, March 2021.
66. V. Hindumathi, Quality of service improvement in Wi-Max networks using adaptive resource allocation schemes, Faculty of Electronics and Communication Engineering, Directorate of Research and Development, Jawaharlal Nehru Technological University Hyderabad, Kukatpally, Hyderabad, India, March 2021.
67. Anamika Jain, Offline signature verification, Department of Information Technology, Department of Information Technology, Indian Institute of Information Technology Allahabad, India, March 2021.
68. Ghanahshyam B. Kshirsagar, Improving performance of Devanagari script input-based P300 speller using deep learning, Department of Electrical Engineering, National Institute of Technology Raipur, India, March 2021.
69. Brijesh Ishvarlal Shah, Design approaches for energy efficient LTE access network, Department of Electronics & Communication, Faculty of Technology, Dharmasinh Desai University, Nadiad, India, March 2021.
70. C Lily Srujana, Feature and kernel selection via instance voting: Applications to brain network classification, Department of Electronics and Electrical Communication Engineering Indian Institute of Technology Kharagpur West Bengal, India, May, 2021.
71. Anupam Mandal, Representation and classification of spoken word exemplars, Department of Computer Science and Engineering Indian Institute of Technology - Kharagpur West Bengal - India, May, 2021.
72. Diwakar Naidu, On applications of machine learning techniques for analysis of agrometeorological data, Department of Computer Science and Information Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur (A Central University), Bilaspur (C.G.), India, May, 2021.
73. Protima Nomo Sudro, Enhancement of cleft lip and palate speech, Department of Electronics and Electrical Engineering, Indian Institute of Technology Guwahati, Guwahati, India, May, 2021.
74. Jayesh Himmatbhai Munjani, Accurate and energy-efficient mobile object tracking in wireless sensor network, Chhotubhai Gopalbhai Patel Institute of Technology, Bardoloi, Surat, Uka Tarsadia University, Tarsadi, Surat, India, May, 2021.
75. Sateesh Reddy Avutu, Development of touch screen based indigenous powered wheelchair with navigation system, Department of Biomedical Engineering, School of Technology, North-Eastern Hill University, Shillong, India, June, 2021.

**Session Chair/Track Chair/Tutorial Chair/General Chair/Founding Chair/Program Chair:**

1. Special session on Non-stationary signal analysis methods and applications at 5th Indian International Conference on Artificial Intelligence (IICAI-11), 14-16 December, 2011, Tumkur, India.
2. Special session on EEG and ECG signal processing at International Conference on Medical Biometrics (ICMB-2014), 30 May-01 June, 2014, Shenzhen, China.

3. Track chair at IEEE UPCON 2015, 04-06 December, 2015 IIIT Allahabad, India.
4. Tutorial chair at 23rd International Symposium on VLSI Design and Test (VDAT-2019), 04-06 July, 2019, IIT Indore, India.
5. Session chair at 10<sup>th</sup> International Conference on Soft Computing for Problem Solving (SocPros 2020), IIT Indore, Indore, India, 18-20 December, 2020.
6. Co-General Chair, International Conference on Technology, Research, and Innovation for Betterment of Society (TRIBES-2021), IIIT Naya Raipur, Chhattisgarh, India, 17-19 December, 2021.
7. Founding chair, 3<sup>rd</sup> International Conference on Machine Intelligence and Signal Processing, 23-25 September, 2021, NIT Arunachal Pradesh, India.
8. Session chair for Brain Computer Interface session, International Conference on Machine Vision and Augmented Intelligence (MAI-2021), 11-14 February, 2021, IIITDM Jabalpur, 14<sup>th</sup> February, 2021.
9. Program chair, The 4th International Conference on Recent Trends in Image Processing & Pattern Recognition (RTIP2R), December 8-10, 2021, University of Malta, Msida, Malta.

#### **Editorship:**

1. Editor: Journal of Intelligent Systems (2012-2015).
2. Editor: IETE Technical Review Journal (May 2017 to present).
3. Associate Editor: Biomedical Signal Processing and Control (Elsevier) (February 2018 to present).
4. Associate Editor for special session on Non-stationary signal analysis methods and applications at 5th Indian International Conference on Artificial Intelligence (IICAI-11), 14-16 December, 2011, Tumkur, India.
5. Associate Editor for the IEEE EMB Conference for the Biosignal Processing Theme, 41<sup>st</sup> EMB Conference 2019, 23-27 July, 2019, Berlin, Germany.
6. Associate Editor: Electronics Letters (January 2019 to present).
7. Associate Editor for 42<sup>nd</sup> Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC) in conjunction with the 43<sup>rd</sup> Annual Conference of the Canadian Medical and Biological Engineering Society, 20-24 July, 2020, Montreal, Canada (Theme: Biomedical Signal Processing).
8. Guest Editor for a special issue on Machine Learning and Big Data Analytics in Energy Infrastructure, including Economic Implications, MDPI Energies journal, 2020 (With Prof. Dipankar Deb and Prof. Moinak Maiti).
9. Review Editor, Editorial board of Mathematics of Computation and Data Science (specially section of Frontiers in Applied Mathematics and Statistics) (12 August, 2020 to present).
10. Associate Editor for the IEEE EMBS Conference Editorial Board (CEB) for 2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), October 31 - November 4, 2021, Expo Guadalajara, Mexico (Theme: Biomedical Signal Processing).
11. Review Editor, Editorial Board of Brain Imaging Methods (specialty section of Frontiers in Neuroscience and Frontiers in Neurology) (20<sup>th</sup> February, 2021 to present).

#### **Invited Lectures/Talks/Seminars/Keynote Speeches Delivered:**

1. Expert talk on Advanced time-frequency techniques for biomedical signal and image analysis, Faculty Development Program (FDP) sponsored by AICTE-ATAL in "Signal processing and machine learning for AI-driven healthcare systems, 23-27 June, 2021, Department of Electrical Engineering, IIT Patna, Patna, India, 23<sup>rd</sup> June, 2021.
2. Invited talks on Introduction to neural network and back propagation, tutorial on neural network and back propagation, tutorial on convolutional neural networks, speech data and feature engineering, speech data-speaker recognition and speech to text, Future Skilled Program on Artificial Intelligence and Machine Learning (16-26 June, 2021), 21<sup>st</sup>, 22<sup>nd</sup>, and 25<sup>th</sup> June, 2021, IIT Indore.

3. Keynote speech on Fourier-Bessel series expansion based empirical wavelet transform for non-stationary signals, 7<sup>th</sup> National Conference on Advancements in Communication, Computing and Electronics Technology (ACCET-2021), MES College of Engineering, Pune, India, 19<sup>th</sup> June, 2021.
4. Resource person, The online short-term course on Neural Networks and Deep Learning, June 14-18, 2021, Department of Electronics and Communication Engineering, National Institute of Technical Teachers Training and Research (NITTTR) Chandigarh, June 17, 2021. (Topic: FBSE-EWT based methods for automated classification of biomedical signals and images)
5. Guest lecture on FBSE-EWT technique: A new tool for biomedical signal analysis, Scheme for Promotion and Research Collaboration (SPARC) International Workshop on Recent Trends in Biomedical Instrumentation and Assistive Technology, 26-28 May, 2021, Department of Instrumentation and Control Engineering, NIT Trichy, India, 26<sup>th</sup> May, 2021.
6. Expert talk on Applications of wireless communication in telemedicine for diagnosis of brain diseases one-week online ATAL Faculty Development Program on "Modern Techniques for Wireless Communication from 17<sup>th</sup> - 21<sup>st</sup> May 2021, Department of Electronics Engineering, MITS, Gwalior, India, 18.05.2021.
7. Invited talk on Machine learning for automated diagnosis of glaucoma from fundus images, AICTE sponsored two week faculty development programme on Machine Learning in Image Processing Applications, Department of Electronics and Communication Engineering, Potti Sriramulu Chalavadi Mallikarjuna Rao College of Engineering and Technology, 15<sup>th</sup> March 2021 to 27<sup>th</sup> March 2021, 20<sup>th</sup> March, 2021.
8. Invited talk on Brain signal analysis and classification, Recent trends in Signal Processing and Machine Learning with their Applications, 8–12 March, 2021, Department of Electronics and Communication Engineering, National Institute of Technology, Hamirpur, Himachal Pradesh, India, 10<sup>th</sup> March, 2021.
9. Invited talk on Sound and waves (in Hindi), Rashtriya Avishkar Abhiyan, Indian Institute of Technology Indore, Indore, 10<sup>th</sup> March, 2021.
10. Invited talk on Automated diagnosis of glaucoma based on fundus images, One Week International Research Workshop on Advances in Deep Learning and Applications (WADLA 2021), Indian Institute of Information Technology, Sri City, Chittoor, India, 22-26 February 2021, 26<sup>th</sup> February, 2021.
11. Invited talk on Time-frequency transforms and classification of EEG signals, Online Short Term Course on Basic2Advance of Signal Processing for Engineering Applications, MNIT Jaipur, India, 15.02.2021-19.02.2021, 18<sup>th</sup> February, 2021.
12. Invited talk on 5G Technology applications in AI and signal processing based medical diagnosis using telemedicine, Online Faculty Development Program on Emerging Trends in VLSI and Nanoelectronics for Building Atmanirbhar Bharat Organized by Centre for Advanced Electronics (CAE) Indian Institute of Technology Indore 15-20 February, 2021, 15<sup>th</sup> February 2021.
13. Invited talk on Research, research methodology and publication, TEQIP-III, BPUT Odisha Sponsored Three Days Online Short Term Training Program On "Essential Tools and Techniques in Research Methodology" ETTRM-2021 (11-13 February, 2021) Organized by Department of Electronics & Communication Engineering, Silicon Institute of Technology, Sambalpur, India, 11<sup>th</sup> February, 2021.
14. Invited talk on EEG signal classification techniques for brain disease diagnosis, AICTE sponsored TWO WEEK FDP on "Hands-on project based approach for Biomedical Signal Analysis using MATLAB, Kakatiya Institute of Technology and Science, Warangal (KITSW), Telangana, India, FDP Phase-2 (01 February-13 February,2021), 05<sup>th</sup> February, 2021.
15. Invited online talk on Brain signal processing: Analysis and classification of EEG signals, MILE Laboratory, Department of Electrical Engineering, Indian Institute of Science, Bangalore, India, 14<sup>th</sup> Januray, 2021.
16. Invited online talk on Research directions in the area of brain signal processing, Short Term Course on Research Opportunities in Biomedical Engineering: Theory to Device (ROBiE) 08-12 January 2021, Department of Electronics and Communication Engineering Indian Institute of Information Technology Design and Manufacturing, Kancheepuram, Chennai, India, 08<sup>th</sup> Januray, 2021. (Also delivered Felicitiation Address)
17. Keynote speech on Fourier-Bessel series expansion based empirical wavelet transform for signal processing, International e-Conference on Intelligent Systems and Signal Processing (e-ISSP 2020), Department of Electronics & Communication Engineering, G H Patel College of Engg. & Tech., Vallabh Vidyanagar, India, 28-30 December, 2020, 30<sup>th</sup> December, 2020. (Also delivered valedictory speech)

18. Expert talk on Research and article writing process, AICTE Sponsored Six Days Short Term Training Program (STTP) on Technical Writing & Research Methodology, Department of Electrical & Electronics Engineering, Chaitanya Bharathi Institute of Technology, Proddatur, Kadapa, India, 28 December, 2020 to 03 January, 2021 (Slot 3), 28<sup>th</sup> December, 2020. (Also delivered inaugural ceremony speech)
19. Invited talk on Artificial intelligence applications to EEG signal classification, Online Faculty Development Programme (FDP) in 'Artificial Intelligence and Machine Learning – Basics and Applications' organized by CALEM under the Aegis of PMMMNMTT, Ministry of Education, Govt of India in collaboration with Department of Computer Science and Applications, Panjab University, Chandigarh, India, 22-28 December, 2020, 24<sup>th</sup> December, 2020.
20. Invited talks on Basics of signal processing, time-frequency representation, and advanced signal processing, TEQIP-III Sponsored Online Short Term Course on Condition Monitoring of Rotating Machines using Advanced Signal Processing Techniques (21-23 December, 2020), 21<sup>st</sup>, 22<sup>nd</sup>, and 23<sup>rd</sup> December, 2020, Department of Mechanical Engineering, IIT Indore.
21. Resource person, UGC-HRDC Short-term Course in Bio-medical Technology with focus on Stress and its Remedies, Department of Biomedical Engineering, North-Eastern Hill University, Shillong, India, 14-21 December, 2020, 21<sup>st</sup> December, 2020. (Topic: Automated classification system for brain signals)
22. Expert talk on Research and technical communication, AICTE Sponsored Six Days Short Term Training Program (STTP) on Technical Writing & Research Methodology, Department of Electrical & Electronics Engineering, Chaitanya Bharathi Institute of Technology, Proddatur, Kadapa, India, 14-19 December, 2020 (Slot 2), 19<sup>th</sup> December, 2020. (Also delivered valedictory speech)
23. Guest speaker in one week FDP under AICTE-ATAL academy on "Applications of Signal and Image Processing" from 15<sup>th</sup> to 19<sup>th</sup> December, 2020, in Department of Electronics & Communication Engineering LNCT, Bhopal, 18<sup>th</sup> December, 2020. (Topic: Applications of signal processing methods for classification of brain signals)
24. Expert talk on Signal processing and machine learning based EEG signal classification techniques, AICTE Sponsored Online Short Term Training Programme (STTP) under AQIS on Advance & Emerging Trends in Signal Processing using Machine Learning, Phase II: 7-12 December, 2020, GIET University, Gunupur, Odisha, India, 08<sup>th</sup> December, 2020.
25. Expert talk on Time-frequency approaches for signal representation, TEQIP-III Sponsored Short Term Course on Signal and Image Compression: From Fundamentals to Standards 03 Days (07-09 December, 2020), Department of Electrical Engineering, Indian Institute of Technology Indore, Indore, India, 07<sup>th</sup> December, 2020.
26. Keynote speech on FBSE-EWT method: A new domain for signal and image analysis, International Conference on Advanced Communication Technologies and Signal Processing (IEEE ACTS-2020| Virtual Conference), NIT Silchar, India, 04-06 December, 2020, 06<sup>th</sup> December, 2020.
27. Webinar on Wavelet analysis for signal processing, Department of Electronics and Communication Engineering, Mangalore Institute of Technology and Engineering, Moodabidri, Karnataka, India, 4<sup>th</sup> December, 2020.
28. Expert talk on 6G Technology applications in AI based computer-aided medical diagnosis using tele-medicine, TEQIP Sponsored Online Short-Term Course on Artificial Intelligence, Blockchain and Internet of Things for 6G Communications, Department of Electrical Engineering, IIT Indore, 03-05 December, 2020, 03<sup>rd</sup> December, 2020.
29. Expert talk on Research methodology, writing, and publication process of the manuscripts, TEQIP sponsored FDP on 'Fundamentals of Effective Manuscript Writing' during 2-4 December, 2020, Centre for Advanced Electronics, IIT Indore, 03<sup>rd</sup> December, 2020.
30. Expert talk on Research and publication processes, AICTE Sponsored Six Days Short Term Training Program (STTP) on Technical Writing & Research Methodology, Department of Electrical & Electronics Engineering, Chaitanya Bharathi Institute of Technology, Proddatur, Kadapa, India, 30 November-05 December, 2020 (Slot 1), 30<sup>th</sup> November, 2020.
31. Expert talks on EEG and ECG signals analysis and classification, ATAL Academy Sponsored Five Days Faculty Development Program on AI for Healthcare, 23-27 November, 2020, Department of Electronics and Communication Engineering, Sarvajani College of Engineering and Technology, Surat, Gujarat, India, 25<sup>th</sup> November, 2020.

32. Expert talk on Automated diagnosis techniques for heart diseases, TEQIP III Sponsored One-Week Online Short Term Course On Technological Innovations and Challenges in Biomedical Instrumentation (23-27 November 2020), Department of Electrical Engineering and Biotechnology, G. B. Pant Institute of Engineering and Technology, Pauri-Garhwal Uttarakhand, India, 24th November, 2020.
33. Inaugural talk on Wavelet based time-frequency analysis, QIP sponsored short term course on Wavelet via Matrices and its Applications in signals and image processing, Department of Mathematics, IIT Indore, 16-21 November, 2020.
34. Research talk on Research and Publication, Students' Gymkhana, IIT Indore, 12th November, 2020.
35. Expert talks on Applications of artificial intelligence techniques in EEG and ECG signals classification, AICTE Training and Learning (ATAL) Sponsored Five Days Faculty Development Program on Artificial Intelligence: Algorithms and Applications, 09-13 November, 2020, Department of Electronics & Communication Engineering, H.K.E. Society's Poojya Dodda Appa College of Engineering, Kalaburagi, Karnataka, 11th November, 2020.
36. Keynote speech on Automated patient-specific epileptic seizure detection system, AICTE Training and Learning (ATAL) Sponsored Five Days Faculty Development Program on Artificial Intelligence: Algorithms and Applications, 09-13 November, 2020, Department of Electronics & Communication Engineering, H.K.E. Society's Poojya Dodda Appa College of Engineering, Kalaburagi, Karnataka, 09th November, 2020.
37. Expert lecture on Signal Processing (Time-dependent spectral representation) in 5 day STTP on "Industry-Academia Convergence in Electronics & Communication Engineering" under TEQIP-III during 28th October-1st November 2020, 29 October, 2020.
38. Expert talk on Time-frequency analysis and time-scale analysis, TEQIP sponsored online short term course on Noise and Vibration Monitoring of Mechanical Systems, from 29-31 October, 2020, IIT Indore, 29 October, 2020.
39. Webinar on Automated classification techniques based on signal processing and machine learning for computer-aided medical diagnosis, Department of Electronics and Communication Engineering, Vignan's Foundation for Science, Technology & Research (Deemed to be University), Vadlamudi, Guntur, Andhra Pradesh, 27 November, 2020.
40. Expert talk on Signal processing and machine learning algorithms for EEG analysis and classification, AICTE Online STTP on Emerging Trends in Advanced Medical Systems, Applications & System Design Methodologies, 12-17 October, 2020, G.H. Rasoni College of Engineering, Nagpur, India, 12<sup>th</sup> October, 2020.
41. Expert talk on Detection of human brain disorders using novel machine learning approaches, National Seminar on Computer Vision and Image Processing (NaSCoVIP 2020), IEEE Gujarat Section, 09-11 October, 2020, 11th October, 2020.
42. Expert talk on Advanced machine learning methods for EEG and ECG classification, One Week Virtual/ Online Short Term Training Program (STTP) on Advanced Machine Learning for Biomedical Data, 08-12 October, 2020, Electrical Engineering Department & Information Technology Department, NIT Raipur, Raipur, India, 08 October, 2020. (Also Guest of Honor during the inaugural ceremony)
43. Expert talk on Fundamentals of time-frequency analysis, QIP Sponsored (Online) Short Term Course on Computational Techniques in Image and Signal Processing, September 28-03 October, 2020, Department of EIE & ECE, Sant Longowal Institute of Engineering & Technology, Longowal, India, 28.09.2020. (Also Guest of Honor during the inaugural ceremony)
44. Expert talk on 5G technology applications in computer-aided medical diagnosis through tele-medicine , One week online STC on 5G: Devices & Key Enable Technologies under TEQIP-III, Department of Electronics Engineering, MITS, Gwalior, India, 21.09.2020.
45. Expert talk on Computational techniques for classification of electroencephalogram (EEG) signals, TEQIP-III sponsored Faculty Development Program (FDP) on Recent Advances in Computational Techniques from 19.09.2020 to 23.09.2020, 19.09.2020, Department of Information Technology, College of Engineering and Technology, Bhubaneswar, India.
46. Online expert lectures on Applications of machine learning algorithms for heart disease diagnosis and Applications of machine learning algorithms for brain disease diagnosis, TEQIP-III Sponsored Online Workshop on Artificial Intelligence and Machine Learning Applications in Healthcare, September 03-07,

2020, Department of Computer Science Engineering & Electronics and Communication Engineering, National Institute of Technology Meghalaya, India, 03rd and 04<sup>th</sup> September, 2020.

47. Online expert lecture on Intelligent systems for diagnosis of brain disorders, Five Days Online Short-Term Training Program (STTP) on Intelligent Systems and Networks (ISN-2020) (31 August–04 September, 2020) Under Twinning Program TEQIP-III jointly organized by Department of Electronics & Communication Engg, SLIET Longowal & Department of Electronics Engineering, NIT Uttarakhand, 02nd September, 2020.
48. Online expert lecture on Time-frequency domain based signal analysis, Research Talk Series 2020, Department of Electronics and Communication Engineering, IIITDM Kancheepuram, India, 26<sup>th</sup> August, 2020.
49. Online expert talk on Signal processing and machine learning based automated methods for heart disease diagnosis, Two weeks online Faculty Development Program on Recent Trends in Electronics and Communication Engineering, 18.08.2020-28.08.2020, Department of Electronics and Communication Engineering, GB Pant Institute of Engineering & Technology, Puri Garhwal, Uttarakhand, India, 19<sup>th</sup> August, 2020.
50. Online expert talk on Automated analysis and classification of EEG signals for computer-aided medical diagnosis, Faculty Development Program on Recent Advances in Electronics and Communication Engineering, 17.08.2020-21.08.2020, Department of Electrical Engineering, Govt. College of Engineering, Kalahandi, Bhawanipatna, India, 18<sup>th</sup> August, 2020.
51. Online talk (Webinar) on Time-frequency analysis techniques, Kalinga Institute of Industrial Technology, formerly KIIT University, Bhubaneshwar, India, 01<sup>st</sup> August, 2020.
52. Online talk (Webinar) on Research-ethics & methodology in modern education, Department of Basic Sciences and Department of Computer Science, TRUBA College of Science & Technology, Bhopal, 30<sup>th</sup> July, 2020.
53. Online talk (Webinar) on 5G Technology application for automated classification of EEG signals based on tele-medicine, Faculty Development Program on Recent Developments & Limitations of 5G Technology under TEQIP-III, IES College of Technology, Bhopal, India, 29<sup>th</sup> July, 2020.
54. Expert talk on Time-frequency analysis of signals, Department of Electronics, G.H. Rasoni College of Engineering, Nagpur, India, 24<sup>th</sup> July, 2020.
55. Online talk (Webinar) on Research methodology and peer reviewed journal publication process, Shiv Kumar Singh Institute of Technology and Science, Indore, India, 20<sup>th</sup> July, 2020.
56. Keynote speech on Biomedical data analysis and classification, International Symposium /Summit on Data Science: A trending Technology in today's World, Department of Computer Science & Engineering/IT, SAGE University, Indore, India, 16-17 July, 2020, 16th July, 2020.
57. Online talk (Webinar) on Automated methods for classification of brain signals, Rishi M.S. Institute of Engineering & Technology for Women, Hyderabad, India, 15<sup>th</sup> July, 2020.
58. Online talk (Webinar) on Signal processing based on time-frequency domain, IEEE Signal Processing Society, MES's College of Engineering, Pune, India, 14<sup>th</sup> July, 2020.
59. Online talk (Webinar) on Signal processing tools and techniques, IEEE Signal Processing Society, Indian Institute of Information Technology (IIIT), Allahabad, India, 04<sup>th</sup> July, 2020.
60. Keynote speech on MATLAB based time-frequency analysis, TEQIP-III assisted online comprehensive training program on MATLAB for Engineering Graduates, Department of Electronics and Communication Engineering, Bundelkhand Institute of Engineering & Technology (BIET) Jhansi, India, 05-18 June, 2020, 18th June, 2020.
61. Online talk (Webinar) on Evolution prospects of technical education during COVID 19, Sri Satya Sai University of Technology and Medical Sciences, Sehore, India, 09<sup>th</sup> June, 2020.
62. Online talk (Webinar) on Time-frequency analysis, Department of Electronics Engineering, G.H. Rasoni College of Engineering, Nagpur, India, 18<sup>th</sup> May, 2020.
63. Online talk (Webinar) on Peer-reviewed publications, impact factor, H and I Index, and citations, School of Electrical and Electronics Engineering, Sathyabama Institute of Science and Technology (Deemed to be university), Chennai, India, 06<sup>th</sup> May, 2020.

64. Keynote speech on Detection of epilepsy from EEG signals, 2020 4<sup>th</sup> International Conference on Advances in Computing and Data Sciences (ICACDS-2020), Faculty of Information & Communication Technology, University of Malta, Valletta, Malta, 24-25 April, 2020.
65. Lecture on Signal analysis techniques, QIP Short Term Course on Recent Advancement in Signal and Image Processing with Hands-on Sessions, Department of Electrical Engineering, IIT Indore, Indore, India, 02-06 March, 2020, 03 March, 2020.
66. Keynote speech on Time-frequency analysis and applications, Short Term Training Programme (STTP) under TEQIP-III on Implementing 5G Technologies for IoT, Healthcare & Autonomous Driving (V2X Technology), Bansal Institute of Science & Technology (BIST), Bhopal, India under Rajiv Gandhi Pradyogiki Vishwavidyalaya, Bhopal, India (29-31, January 2020), 31<sup>st</sup> January, 2020. (Also delivered valedictory speech)
67. Lecture on EEG-ECG signal processing for health care technology, TEQIP Short term course on Application of MATLAB in BIOENGINEERING, 27-31 January, 2020, 30 January, 2020, Department of Mechanical Engineering and Department of Biosciences & Biomedical Engineering at IIT Indore, Indore, India.
68. Lecture on Machine learning and signal processing based methods for computer-aided medical diagnosis, IEEE Lecture Series, IEEE Kharagpur Section, Indian Institute of Technology Kharagpur, Kharagpur, India, 27<sup>th</sup> January, 2020.
69. Valedictory speech on Database and algorithms (Information Technology), One Week Faculty Development Programme (FDP), Organized By Department of Information Technology Shri G. S. Institute of Technology and Science, Indore (MP), India, 30th December, 2019 (26th –30th December, 2019).
70. Expert talk on Machine learning for heart and brain diseases in Faculty Development Program on "Machine Learning" at Department of Computer Science & Engineering, Institute of Engineering & Science, IPS Academy, Indore, India, 27<sup>th</sup> December, 2019 (23 December, 2019-04 January, 2020).
71. Expert talk on Machine learning for classification of EEG signals in Department of Science and Technology Funded Short Term Training Program on "Artificial Intelligence (AI), Machine Learning (ML) and Deep Learning" at Maulana Azad National Institute of Technology, Bhopal, India, 26<sup>th</sup> December, 2019 (17-26 December, 2019).
72. Expert talk on Time-frequency analysis and applications in communications in Faculty Development Program on "Signal Processing Perspectives in Wireless Communication" at Department of Electronics & Telecommunication Engineering, Babasaheb Naik College of Engineering, Pusad, Yavatmal, Maharashtra, India, 23<sup>rd</sup> December, 2019 (19-28, December, 2019).
73. Expert talk on Biomedical signal processing (EEG, ECG, and HRV signals) in AICTE sponsored two week Faculty Development Programme on "Pedagogy of Signal Processing and its Application" at Department of EXTC, RAIT, Nerul, Navi Mumbai, India, 16th December, 2019 (09-20 December, 2019).
74. Expert talk on Time-frequency analysis for communications, AICTE Sponsored Two Week Faculty Development Programme on "Recent Advances in Microwave and Communication", Department of Electronics & Telecommunication Engineering, Shri G. S. Institute of Tech. and Science, Indore, India, 10<sup>th</sup> December, 2019 (03-13 December, 2019).
75. Expert talk on Machine learning and signal processing for computer-aided medical diagnosis, Short Term Training Program on "Design and Development of System on chip using Low Power VLSI", Sponsored by All India Council for Technical Education (AICTE), Department of Electronics & Instrumentation Engineering, Shri G. S. Institute of Tech. and Science, Indore, India, 25-30 November, 2019.
76. Lectures on Variational mode decomposition based methods for speech signal analysis and time-frequency analysis, AICTE Sponsored Two Weeks Faculty Development Program on Emerging Trends in Speech, Image & Video Processing Techniques, 27<sup>th</sup> November, 2019 (25<sup>th</sup> November, 2019 to 07<sup>th</sup> December, 2019), Department of Electronics and Telecommunication Engineering, Sanjivani College of Engineering, Kopergaon, Maharashtra, India.
77. Invited talk on Automated analysis and classification of brain waves (EEG signals) for BCI applications, Faculty Development Program on Recent Trends in Robotics Control & Instrumentation, Department of Electronics & Instrumentation Engineering, IET, Bundelkhand University, Jhansi, 18-22 November, 2019.



78. Keynote speech on Analysis and classification of EEG signals for medical applications, International Conference on Recent Advances in Communication, Energy and Sensors (RACES 2019), Sathyabama Institute of Science and Technology (Deemed to be University), Chennai, India, (13th -15th November, 2019).
79. Invited talk on Computer-aided diagnosis for epilepsy, International Conference on Computational Mathematics and its Applications (CMA 2019), 12-14 November, 2019.
80. Lecture on Time-Frequency domain based signal analysis, Birla Institute of Technology and Science (BITS) Pilani-Goa Campus, Goa, India, 16<sup>th</sup> September, 2019.
81. Keynote speech on Signal processing and machine learning for biomedical applications, Lumini'19, Tech Symposium, Birla Institute of Technology and Science (BITS) Pilani, Goa, 14-15 September, 2019.
82. Keynote speech on Automated systems for classification of non-stationary biomedical signals, International Conference on Machine Intelligence and Signal Processing (MISP-2019), in Indian Institute of Information Technology, Allahabad at Prayagraj, Uttar Pradesh, India, 07-10 September, 2019.
83. Lecture on Research Methodology, TEQIP Sponsored Two Days Workshop on Research Methodology & R programming, Madhav Institute of Technology and Science (MITS), Gwalior, India, 31 August-01 September, 2019.
84. Lecture on "Research for UG and PG students", Sri Ram College of Engineering and Management, Banmore, Morena, 30 August, 2019.
85. Lecture on Time-Frequency analysis using MATLAB, TEQIP Short term course on "Programming for Research Application using MATLAB", Department of Mechanical Engineering, Indian Institute of Technology Indore, Indore, India, 29 June -01 July, 2019.
86. Lectures on Research Methodology and Technical Communication to develop skills which will strengthen their endeavours in the pursuit of PhD level projects, R&D and supervision of graduate students in the Masters' and PhD Programmes, Faculty Induction Program 2019 on Advanced Pedagogy and Digital Tool, Indian Institute of Technology Indore, Indore, India, Phase I-17 June -21 June, 2019 and Phase II-24 June - 28 June, 2019.
87. Guest lectures on Time-frequency methods and automated classification of EEG signals, Faculty Development Program entitled "Recent Trends in Signal Processing", Department of Electronics and Communication Engineering, Aditya Engineering College, Surampalem, Andhra Pradesh, India, 23<sup>rd</sup> April, 2019.
88. Lecture on Time-frequency analysis for gearbox fault diagnosis, A Short Term Course on Vibration Monitoring Techniques for Machinery Fault Diagnosis, Department of Mechanical Engineering, Indian Institute of Technology Indore, Indore, India, 18-19 March, 2019.
89. Lecture on Implementation of signal processing algorithms for health care systems, TEQIP III Sponsored Short Term Course on Advancements in Microelectronics and VLSI Design, Department of Electronics and Instrumentation Engineering, Shri G.S. Institute of Technology and Science, Indore, India, 11-15 March, 2019.
90. Lecture on EEG signal processing for medical applications, TEQIP III Sponsored Short Term Course on Signal and Image Processing for Medical Applications, Department of Electronics and Communication Engineering, Visvesvaraya National Institute of Technology, Nagpur, India, 20-24 February, 2019.
91. Lecture on ECG signal processing for medical applications, TEQIP III Sponsored Short Term Course on Signal and Image Processing for Medical Applications, Department of Electronics and Communication Engineering, Visvesvaraya National Institute of Technology, Nagpur, India, 20-24 February, 2019.
92. Lecture on Automated systems for diagnosis of heart diseases based on flexible analytic wavelet transform, School of Medicine, Taylor's University, Subang Jaya, Malaysia, 29 January, 2019.
93. Lecture on Automated analysis and classification of EEG signals, School of Medicine, Taylor's University, Subang Jaya, Malaysia, 28 January, 2019.
94. Lecture on Signal processing in joint time-frequency domain, Veer Surendra Sai University of Technology, Burla, Odisha, India, 18 January, 2019.

95. Lecture on Application of machine learning for classification of EEG signals, Short-Term Course on Advanced Data Analytics using Machine Learning, Acropolis Institute of Technology and Research, Indore, India, 17 Januray, 2019.
96. Lecture on Modern time-frequency analysis techniques, Jaypee University of Engineering and Technology, Guna, India, 12 Januray, 2019.
97. Lectures on Matlab and time-frequency analysis methods, Faculty Development Programme (FDP) under TEQIP-III (RGPV) on Matlab and Its Applications, Oriental College of Technology, Bhopal, India, 27-31 December, 2018.
98. Lectures on Classification of EEG signals, Short Term Course on Machine Learning, Indian Institute of Technology Indore, Indore, India, 13-15 December, 2018.
99. Lectures on Signal analysis and time-frequency signal processing, Three-Day Short Term Course on Research and Development in Condition Monitoring of Rotating Machines, Indian Institute of Technology Indore, Indore, India, 06-12 December, 2018.
100. Lectures on Signals and systems, Department of Electronics Engineering, Yeshwantrao Chavan College of Engineering, Nagpur, India, 27-29 September, 2018.
101. Lecture on MATLAB based time-frequency analysis, Faculty Development Programme on Numerical Algorithms and Programming using MATLAB under Electronics and ICT Academy, Indian Institute of Information Technology, Design and Manufacturing, Jabalpur, India, 11-15 July, 2018.
102. Lectures on How to get research proposals and funding: Innovation, entrepreneurship, and interdisciplinary research, Summer Faculty Training Program on 'Active Learning' (under TEQIP-III), Phase 3, 25-29 June, 2018; Phase 4, 02-06 July, 2018, Indian Institute of Technology Indore, Indore, India.
103. Lecture on Implementation of time-frequency analysis methods in MATLAB, One Week Faculty Development Programme on Programming and GUI Development using MATLAB, Acropolis Institute of Technology and Research, Indore, India and Indian Institute of Information Technology, Design and Manufacturing, Jabalpur, India, 11-15 June, 2018.
104. Lectures on Time-frequency analysis and biomedical signal processing, Faculty Development Program under TEQIP-III, Research Avenues and Trends on Digital Signal Processing, Computational Algorithms and Architectures -2018, Hindustan College of Science and Technology, Mathura, India, 04 June-09 June, 2018.
105. Lecture on Time-frequency domain representation, TEQIP sponsored six-day short term course on Sustainable Water Resources Management under Changing Climate, Department of Civil Engineering, Indian Institute of Technology Indore, Indore, India, 28 May-02 June, 2018.
106. Lectures on Basics of signal analysis, Two-Days Short Term Course on Bearing and Gear Fault Diagnosis under TEQIP-III, Department of Mechanical Engineering, Indian Institute of Technology Indore, Indore, India, 26-27 March, 2018.
107. Lectures on Digital signal processing, Department of Electronics Engineering, Yeshwantrao Chavan College of Engineering, Nagpur, India, 01-03 February, 2018.
108. Lectures on Peer-reviewed publications (Impact factor, H & I index, citation), Faculty Induction Workshops under TEQIP-III, Indian Institute of Technology Indore, Indore, India, Phase A: 17-21 January, 2018, Phase B: 23-27 January, 2018, and Phase C: 29 January–02 February, 2018.
109. Keynote speech on Time-frequency domain based signal processing, National Conference on Emerging Trends and Research in Electronics & Communication Engineering-2018 (NCETRECE), 26 November, 2017, Department of Electronics and Communication Engineering, Lakshmi Narain College of Technology, Indore, India.
110. Keynote speech on Automated classification of electroencephalogram signals, National Conference on Soft Computing and Intelligent Techniques in Science and Engineering (SCITSE), 25 November, 2017 Department of Computer Science & Engineering, NIT Raipur, Raipur, India.
111. Inaugural lecture on Time-frequency analysis, TEQIP Two-day seminar on Mathematical Techniques in Wireless Networks, Shri Govindram Seksaria Institute of Technology and Science, Indore, India, 27 October, 2017.

112. Keynote speech on EEG signal processing based on empirical wavelet transform, 2017 IEEE International Conference on Power, Control, Signals and Instrumentation Engineering (ICPCSI), 21-22 September, 2017, Chennai, India.
113. Keynote speech on Empirical wavelet transform based techniques for epilepsy diagnosis, 2017 International Conference on Current Trends in Computer, Electrical, Electronics and Communication (CTCEEC), 08-09 September, 2017, Mysore, India.
114. Guest lecture on Automated techniques for classification of EEG signals, Indian Institute of Information Technology, Allahabad, India, 04 September, 2017.
115. Guest lecture on Problems in biomedical signal processing, Department of Electronics and Electrical Engineering, Indian Institute of Technology Guwahati, Guwahati, India, 24 August, 2017.
116. Invited talk on Computer-aided diagnosis of epilepsy from EEG signals using empirical wavelet transform, International Symposium on Computational Mathematics, Optimization, and Computational Intelligence (CMOCI 2017), Indian Institute of Technology Indore, Indore, India, 17-19 July, 2017.
117. Invited talk on Speech signal processing based on variational mode decomposition, National Technical Research Organization, Government of India, New Delhi, India, 04 July, 2017.
118. Invited talk on Empirical wavelet transform based methods for analysis and classification of epileptic seizure EEG signals, Department of Electronics and Electrical Engineering, Indian Institute of Technology Guwahati, Guwahati, India, 08 April, 2017.
119. Lecture on Joint time-frequency analysis and applications to MEMS signal analysis, Short Term Course on Mechatronics, MEMS, and Micro Fabrication, School of Engineering, Indian Institute of Technology Indore, Indore, India, 19-23 December, 2016.
120. Lecture on Fourier transform to tunable-Q wavelet transform (TQWT), National Workshop on Wavelet Transform and its applications in Signal Processing sponsored by M. P. Council of Science and Technology, Department of Electronics and Communication Engineering, IES, IPS Academy, Indore, India, 04-05 November, 2016.
121. Seminar on Automated classification of EEG signals for computer-assisted diagnosis, National Workshop on Recent Advances in Biomedical Signal Processing: Applications to Rehabilitation and Therapeutic Solution (BSP:RTS16), Department of Biomedical Engineering, National Institute of Technology, Raipur, India, 21-23 August, 2016.
122. Seminar on Automated diagnosis of diabetic and coronary artery diseases using heart signals, National Workshop on Recent Advances in Biomedical Signal Processing: Applications to Rehabilitation and Therapeutic Solution (BSP:RTS16), Department of Biomedical Engineering, National Institute of Technology, Raipur, India, 21-23 August, 2016.
123. Seminar on Detection of epileptic seizures from EEG signals, International Conference on Recent Advances in Mathematics and Their Applications (ICRAMTA-2016), Department of Mathematics, University of Rajasthan, Jaipur, India, 10-12 July, 2016.
124. Keynote speech on Automated classification of EEG signals for computer-aided medical diagnosis, National Conference on Advances in Neuroimaging and Applications in Cognitive Disorders (ANACOD), 03-04 May, 2016, National Brain Research Center, Manesar, Haryana, India.
125. Seminar on Automated classification of EEG signals using non-stationary signal models, Faculty Development Programme on Theory and Applications of Signals and Systems, Maulana Azad National Institute of Technology, Bhopal, India, 18-23 March, 2016.
126. Seminar on Modern computing methods for adaptive interfaces in aBCI, Two Days National level Workshop on Modern computing technologies for Affective Brain Computer Interface (ABCI), Kovilpatti, Tamil Nadu, India, 08th January, 2016.
127. Seminar on Features for automatic diagnosis of epilepsy from EEG signals, Aalto University, Helsinki, Finland, 30th October, 2015.
128. Seminar on Computer-aided diagnosis of coronary artery disease from heart rate signals based on nonstationary signal processing, First Finnish-Indian Joint Symposium on Future Opportunities in Health, Drug Development and Diagnostics, University of Turku, Turku, Finland, 27th October, 2015.

129. Lecture on Empirical mode decomposition based methodologies for analysis and classification of epileptic seizure EEG signals, R&D lecture on 'Path towards Effective Research', Kongu Engineering College, Perundurai, Erode, Tamilnadu, India, 20th June, 2015.
130. Lecture on Features based on the non-stationary signal models for analysis and classification of brain signals (EEG and MRI), DBT sponsored seminar on 'Advances in Bio-inspired Computing for Medical Image Diagnostics', Kongu Engineering College, Perundurai, Erode, Tamilnadu, India, 19th June, 2015.
131. Seminar on Features based on the non-stationary signal models for analysis and classification of EEG signals, School of Computing and Intelligent Systems, University of Ulster, Magee Campus, Northern Ireland, UK, 12th December, 2014.
132. Keynote speech on Detection of epileptic seizures from EEG signals, Third National Seminar on Advance Techniques in Signal Processing and Communication, 28th November, 2014, LNCT, Indore, India.
133. Lecture on Classification of EEG signals based on empirical mode decomposition, Three Day Workshop on Recent Trends in Biomedical Engineering and Healthcare Services, Organized by Department of Biomedical Engineering, Shri G.S. Institute of Science and Technology, Indore, India, 22 February, 2014.
134. Lecture on Time-frequency analysis with application to wireless communications, One week Short Term Training Program on Fundamentals and Applications of Wireless Communications, Organized by Department of Electronics and Telecommunication, Shri G.S. Institute of Science and Technology, Indore, India, 28 January, 2014.
135. Lecture on Empirical mode decomposition and its applications in EEG signal analysis, National Workshop on Latest Trends in Digital Signal Processing, organized by Department of Electronics, Madhav Institute of Technology and Science, Gwalior, India, 05 October, 2013.
136. Keynote speech on Time-frequency methods, Technosummit 2013, 02-07 September, 2013, Sathyabama University, Chennai, India.
137. Lecture on Time-frequency analysis, Military College of Telecommunication Engineering, Mhow, Indore, India, 16 August, 2013.
138. Lecture on Time-frequency methods for digital communications, STTP on Wireless Digital Communication, University Institute of Technology, Rajiv Gandhi Proudhyogiki Viswavidyalaya, Bhopal, India, 17-21 June, 2013.
139. Keynote speech on Time-frequency signal processing, National Conference on Emerging Trends in Electronics Engineering (NCETEE-2013), Bhopal, India.
140. Lecture on Modeling of non-stationary signals, Faculty Development Programme on Advances in DSP and VLSI Technology, organized by Department of Electronics and Communication Engineering, S.D. Bansal College of Technology, Indore, India, 04-05 January, 2013.
141. Lecture on Time-frequency analysis, AICTE Sponsored Staff Development Programme on Current Trends in Signal Processing, organized by Department of Electronics and Instrumentation Engineering, Samrat Ashok Technological Institute, Vidisha-464001, India, 16-18 September, 2011.
142. Talk on Wavelets, Department of Electronics and Communication Engineering, Acropolis Institute of Technology and Research Indore-453771, India, 27 September, 2011.
143. Keynote speech on Time-frequency domain based methods, National Conference on Recent Trends in Communication Engineering-2011, Indore, India.
144. Lecture on Non-stationary signal analysis techniques, STTP on Digital Image and Signal Processing, Maulana Azad National Institute of Technology, Bhopal, India, 28 November-02 December, 2011.
145. Keynote speech on Signal analysis using wavelets, National Conference on Emerging Trends in Signal Processing and VLSI Design-2010, Bhopal, India.
146. Seminar on Fourier-Bessel decomposition based methods for analysis of non-stationary signals, System Modeling and Dependability Laboratory, University of Troyes, Troyes, France, 16th April, 2007.

**Subject Expert for Faculty Selection Committee:**

1. Department of Computer Science and Engineering, National Institute of Technology, Raipur, India, 02-04 June, 2021.
2. Department of Electrical and Instrumentation Engineering, Thapar Institute of Engineering & Technology, Patiala, Punjab, India, 31<sup>st</sup> March, 2021.
3. Department of Electronics and Communication Engineering, Indian Institute of Information Technology, Dharwad, India, 21-22 December, 2020.
4. Department of Electronics and Communication Engineering, Indian Institute of Information Technology, Design and Manufacturing (IIITDM), Kancheepuram, India, 15<sup>th</sup> and 23<sup>rd</sup> December, 2020.
5. Faculty of Communication and Engineering, Military College of Telecommunication Engineering (MCTE), Mhow, Indore, India, 02-05 November, 2020.
6. Department of Electronics & Communication Engineering (ECE), Sant Longowal Institute of Engineering and Technology, Longowal, India, 23<sup>rd</sup> February, 2020.
7. Faculty of Communication and Engineering, Military College of Telecommunication Engineering (MCTE), Mhow, Indore, India, 05-06 November, 2019.
8. Department of Electronics & Instrumentation /Biomedical Engineering, Shri Govindram Seksaria Institute of Technology and Science (SGSITS), Indore, India, 04<sup>th</sup> July, 2019.
9. Department of Electrical Engineering/Electronics & Communication Engineering/Center for VLSI & Nanotechnology, Visvesvaraya National Institute of Technology (VNIT), Nagpur, India, 01-03 March, 2018.
10. Department of Electrical Engineering/Electronics Engineering, Medi-Caps University, Indore, India, 4th July, 2018.
11. Department of Electronics & Communication Engineering, Indian Institute of Information Technology (IIIT) Bhopal, Bhopal, India, 8th June, 2018.
12. Department of Electronics & Communication, Shri Vaishnav Institute of Technology and Science, SVVV, Indore, India, 26th February, 2018.
13. Faculty of Communication and Engineering, Military College of Telecommunication Engineering (MCTE), Mhow, Indore, India, 6th August, 2018.
14. Department of Electrical Engineering, Shri Govindram Seksaria Institute of Technology and Science (SGSITS), Indore, India, 9<sup>th</sup> August, 2018.

**Administrative Experience:**

1. Senate member, IIITDM Kancheepuram, India, 01st April, 2021 to present.
2. Academic expert member, Board of Studies of Electronics & Communication Engineering Department, IES University, Bhopal, India, 10<sup>th</sup> February, 2021.
3. Expert member, NBA advisory committees namely department advisory board (DAB) and program assessment committee (PAC), Department of Electronics & Communication, Poojya Doddappa Appa College of Engineering, Kalaburagi (Gulbarga), India, 16<sup>th</sup> January, 2021 to present.
4. Subject Expert, Board of Studies, Department of Electronics & Communication Engineering, IPS Academy, Institute of Engineering and Science, Indore, India, 06<sup>th</sup> October, 2020.
5. Expert member, Board of Studies, Department of Electronics & Telecommunication Engineering, G.H.Raisoni Institute of Engineering & Management, Jalgaon, India, 28 July, 2020.
6. Expert Member, Board of Studies Meeting, Department of Information Technology, Shri G.S. Institute of Technology & Science, Indore, India, 16<sup>th</sup> July, 2020, 06<sup>th</sup> February, 2021.
7. Special Invitee (Expert member), Review meeting of Engineering Science scheme (Electrical, Electronics & Computer Science Engineering domain), Science and Engineering Research Board (SERB), IIT Madras, 06-07 March, 2020.
8. Associate Dean, Academic Affairs (UG Programme), Indian Institute of Technology Indore, Indore, India from 01 January, 2020 to present.

9. Member (Academic), Board of Studies, Electronics & Communication, Electronics and Instrumentation and Electrical Engineering, Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore, India, March 2019 to present.
10. Assessor, National Assessment and Accreditation Council (NAAC), 03 December, 2018 to present.
11. Faculty Advisor, Electronics Club, Science and Technology Club activities of the students, Indian Institute of Technology Indore, Indore, India, October 2018 to present.
12. External Member, Board of Studies, Electronics and Communication Engineering Department, Jaypee University of Engineering and Technology, Guna, India, July 2018 to present.
13. Senate Member, Indian Institute of Technology Indore, Indore, India, from 18 December, 2017 to present.
14. Expert Member, Board of Studies, Department of Biomedical Engineering, Shri G.S. Institute of Technology & Science, Indore, India, May 2018 to present.
15. Expert member, Meeting of Faculty of Engineering and Board of Studies, Medi-Caps University, Indore, India, 01 February, 2020 to 31 January 2023.
16. External Expert Member, Board of Studies, Electronics and Communication Engineering Department, Maulana Azad National Institute of Technology (MANIT), Bhopal, India, October, 2016, February 2020.
17. Member, State Level Steering Committee, Department of School Education, Government of Madhya Pradesh from 29 August, 2018 to 12 January, 2020.
18. Nodal Officer, Rashtriya Avishkar Abhiyan, Scheme of MHRD, from 30 June, 2015 to 12 January, 2020.
19. Time Table Coordinator, Department of Electrical Engineering, Indian Institute of Technology Indore, Indore, India, from 01 December, 2016 to 03 January, 2020.
20. Member, Department Seminar Committee, Department of Electrical Engineering, Indian Institute of Technology Indore, Indore, India, from 02 February, 2017 to 31 October, 2018.
21. Convener, Department Seminar Committee, Department of Electrical Engineering, Indian Institute of Technology Indore, Indore, India, from 01 November, 2018 to 03 October, 2019.
22. Member of Department Post-Graduate Committee (DPGC), Indian Institute of Technology Indore, Indore, India from 01 July, 2017 to 30 June, 2019.
23. Convener of Scholarship-cum-Eligibility Committee, Indian Institute of Technology, Indore, India from 11 August, 2011 to 08 August 2017.
24. Convener of Department Under-Graduate Committee, Indian Institute of Technology, Indore, India from 12 July, 2013 to 30 June, 2017.
25. Course Coordinator of M. Tech. in Communications and Signal Processing, Indian Institute of Technology Indore, Indore, India from April, 2013 to June, 2015.
26. Distinguished member of Board of Studies for the Faculty of Electrical and Electronics, Sathyabama Institute of Science and Technology (Deemed to be university), Chennai, India, 06<sup>th</sup> September, 2014.
27. Chairman of GATE, Indian Institute of Technology Indore, Indore, India from 25 November, 2011 to 31 July, 2013.
28. Member of Institute Post Graduate Committee, Indian Institute of Technology Indore, Indore, India from 05 February, 2013 to 12 July, 2013.
29. Member of School Post Graduate Committee, Indian Institute of Technology Indore, Indore, India from 01 March, 2012 to 31 December, 2012.
30. Chairman of Rajbhasha Hindi Karyanbayan Samati, Indian Institute of Technology Indore, Indore, India from 13 April, 2010 to 08 December, 2011.
31. Member of Timetable and Classroom Infrastructure Committee, Indian Institute of Technology Indore, Indore, India from 01 April, 2010 to 21 May, 2012.
32. Member of Post Graduate Academic Performance Evaluation Committee, Indian Institute of Technology Indore, Indore, India from 19 May, 2010 to 04 March, 2011.

33. Member of Under Graduate Academic Performance Evaluation Committee, Indian Institute of Technology Indore, Indore, India from 19 March, 2010 to 04 March, 2011.
34. Member of Space, Transport, and Accommodation Committee, Indian Institute of Technology Indore, Indore, India from 20 January, 2010 to 07 February, 2011.
35. Additional Warden of Old Boys Hostel, International Institute of Information Technology, Hyderabad, India from 03 April, 2009 to 01 December, 2009.

**Personal Information:**

Father's Name : Shri Shiv Ram Pachori  
Date of Birth : 8th January, 1979  
Gender : Male  
Marital Status : Married  
Language known : Hindi and English  
Nationality : Indian  
Permanent Address : Village-Haveli, Post-Rithona, Tehsil-Ambah, District-Morena, 476111, M.P., India.

**References:**

1. Dr. Pradip Sircar, Professor, Department of Electrical Engineering, Indian Institute of Technology Kanpur, Kanpur, India, Phone: 0091 512 2597063, Fax: 0091 512 2590063, Email: [sircar@iitk.ac.in](mailto:sircar@iitk.ac.in)
  2. Dr. Hichem Snoussi, Professor, Charles Delaunay Institute, FRE CNRS 2848, University of Technology of Troyes, Troyes, France, Phone: 0033 3 25718087, Fax: 0033 3 25715649, Email: [Hichem.Snoussi@utt.fr](mailto:Hichem.Snoussi@utt.fr)
  3. Dr. David Hewson, Professor, Institute for Health Research, University of Bedfordshire, Luton, UK, Phone: +44 (0) 7525 616645, Email: [david.hewson@beds.ac.uk](mailto:david.hewson@beds.ac.uk)
  4. Dr. Girijesh Prasad, Professor, Intelligent Systems Research Centre, School of Computing, Ulster University, Magee campus, Londonderry, N. Ireland, UK, Phone: +44 - (0)28 71 - 675645, 675409, Email: [g.prasad@ulster.ac.uk](mailto:g.prasad@ulster.ac.uk)
  5. Dr. Vikram M. Gadre, Professor, Department of Electrical Engineering, Indian Institute of Technology Bombay, Powai, Mumbai 400076, India, Phone: +91 22 25767426, Fax: +91 22 25723707, E-mail: [vmgadre@ee.iitb.ac.in](mailto:vmgadre@ee.iitb.ac.in)
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