

Curriculum Vitae

Dr. Ram Bilas Pachori
Professor
Discipline of Electrical Engineering
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Work Experience:

- Professor at Discipline of Electrical Engineering, Indian Institute of Technology Indore, Indore, India from 18 December, 2017 to present. (Also Associated Faculty with Discipline of Biosciences & Biomedical Engineering)
- Visiting Professor at School of Medicine, Taylor's University, Malaysia, from 01 December, 2018 to present.
- Associate Professor at Discipline 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 Discipline 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:

Biomedical Signal Processing, Non-stationary Signal Processing, Speech Signal Processing, Brain-Computer Interfacing, Signal Processing for Mechanical Systems, and Soft Computing Techniques.

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 Proudhyogiki Vishwavidyalaya, Bhopal, India, June 2001.

Thesis and Technical Reports:

1. R.B. Pachori, Development of new methodologies for human postural control, Technical Report, Charles Delaunay Institute, FRE CNRS 2848, University of Technology of Troyes, Troyes, France, February 2008.
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.
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.

Sponsored and Consultancy Projects:

1. Analysis and classification of EEG signals based on nonlinear and non-stationary signal models, 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: Dr. 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: Dr. Ram Bilas Pachori).
3. Analysis of coronary artery disease by signal processing through MATLAB, Professional Group of Conferences (PGC), Visakhapatnam, India, Rs. 7,40,600, Duration: 20 months (August 2017-March 2019). (Consultant: Dr. Ram Bilas Pachori).
4. Detection of human brain disorders using novel machine learning approaches, CSIR, Total cost: Rs. 31,26,240, Duration: Three years (October 2017-October 2020). (Principal Investigator: Dr. M. Tanveer, Co-Principal Investigator: Dr. Ram Bilas Pachori).
5. 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: Dr. Ram Bilas Pachori, Dr. Niranjana Sahoo, Dr. Gourinath Banda).

Research Publications:

Books:

1. D.S. Sisodia, R.B. Pachori, and L. Garg, Advancement of artificial intelligence in healthcare engineering, IGI Global, Accepted, 2019.
2. 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.
3. R.B. Pachori and P. Sircar, Non-stationary signal analysis: Methods based on Fourier-Bessel representation, LAP LAMBERT Academic Publishing, Saarbrücken, Germany, 2010, ISBN: 978-3-8433-8807-8.

Book Chapters:

1. R. Sharma, P. Sircar, and R.B. Pachori, Computer-aided diagnosis of epilepsy using bispectrum of EEG signals, In: S. Paul (Ed.) Biomedical Engineering and its Applications in Healthcare, Springer, 2019, Book Chapter. (Submitted)
2. R.R. Sharma, M. Kumar, and R.B. Pachori, Classification of EMG signals using eigenvalue decomposition based time-frequency representation, In: N. Srimaam (Ed.) Biomedical and Clinical Engineering for Healthcare Advancement, IGI Global, 2018. (Invited)
3. A. Agarwal, L. Garg, E.E. Audu, R.B. Pachori, and J. Dauwels, Early detection of epileptic seizures based on scalp EEG signals, In: R.S. Hegadi and K.C. Santosh (Eds.) Medical imaging: Use of AI, Image Recognition and Machine Learning Techniques, Elsevier, 2019. (Invited)
4. R.B. Pachori and V. Gupta, Biomedical engineering fundamentals, In: F. Firouzi, K. Chakrabarty, and S. Nassif (Eds.) Artificial Intelligence Driven Internet of Things: From Device, to Edge, Cloud, and Applications, Springer, 2019.
5. 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.
6. 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.

7. 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.
8. 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.
9. 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.
10. 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. 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*, In press, 2019.
2. 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*, In press, 2019.
3. 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*, In press, 2019.
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, 2019.
5. 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.
6. 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.
7. 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.
8. V. Gupta, M.D. Chopda, and R.B. Pachori, Cross-subject emotion recognition using flexible analytic wavelet transform from EEG signals, *IEEE Sensors Journal*, vol. 19, no. 06, pp. 2266-2274, March 2019.
9. R. Sharma, P. Sircar, R.B. Pachori, S.V. Bhandary, and U.R. Acharya, Automated glaucoma detection using center slice of higher order statistics, *Journal of Mechanics in Medicine and Biology*, vol. 19, no. 01, 1940011, February 2019.
10. R. Sharma, P. Sircar, and R.B. Pachori, A new technique for classification of focal and non-focal EEG signals using higher order spectra, *Journal of Mechanics in Medicine and Biology*, vol. 19, no. 01, 1940010, February 2019.
11. S. Maheshwari, V. Kanhangad, R.B. Pachori, S.V. Bhandary, and U.R. Acharya, Automated glaucoma diagnosis using bit-plane slicing and local binary pattern techniques, *Computers in Biology and Medicine*, vol. 105, pp. 72-80, February 2019.
12. R.R. Sharma, P. Varshney, R.B. Pachori, and S.K. Vishvakarma, Automated system for epileptic EEG detection using iterative filtering, *IEEE Sensors Letters*, vol. 2, issue 4, article sequence no. 7001904, December 2018.
13. R.R. Sharma and R.B. Pachori, Improved eigenvalue decomposition-based approach for reducing cross-terms in Wigner-Ville distribution, *Circuits, Systems, and Signal Processing*, vol. 37, issue 08, pp. 3330-3350, August 2018.

14. R.R. Sharma and R.B. Pachori, Baseline wander and power line interference removal from ECG signals using eigenvalue decomposition, *Biomedical Signal Processing and Control*, vol. 45, pp. 33-49, August 2018.
15. R.R. Sharma and R.B. Pachori, Eigenvalue decomposition of Hankel matrix-based time-frequency representation of complex signals, *Circuits, Systems, and Signal Processing*, vol. 37, issue 08, pp. 3313-3329, August 2018.
16. D. Bhati, R.B. Pachori, M. Sharma, and V.M. Gadre, Design of time-frequency localized two-band orthogonal wavelet filter banks, *Circuits, Systems and Signal Processing*, vol. 37, issue 08, pp. 3295-3312, August 2018.
17. A. Bhattacharyya, L. Singh, and R.B. Pachori, Fourier-Bessel series expansion based empirical wavelet transform for analysis of non-stationary signals, *Digital Signal Processing*, vol. 78, pp. 185-196, July 2018.
18. M. Kumar, R.B. Pachori, and U.R. Acharya, Automated diagnosis of atrial fibrillation ECG signals using entropy features extracted from flexible analytic wavelet transform, *Biocybernetics and Biomedical Engineering*, vol. 38, issue 03, pp. 564-573, May 2018.
19. M. Sharma, P. Sharma, R.B. Pachori, and U.R. Acharya, Dual tree complex wavelet transform based features for automated alcoholism identification, *International Journal of Fuzzy Systems*, vol. 20, issue 04, pp. 1297-1308, April 2018.
20. P. Gaur, R.B. Pachori, H. Wang, and G. Prasad, A multi-class EEG-based BCI classification using multivariate empirical mode decomposition based filtering and Riemannian geometry, *Expert Systems with Applications*, vol. 95, pp. 201-211, April 2018.
21. A. Bhattacharyya, M. Sharma, R.B. Pachori, P. Sircar, and U.R. Acharya, A novel approach for automated detection of focal EEG signals using empirical wavelet transform, *Neural Computing and Applications*, vol. 29, issue 8, pp. 47-57, April 2018.
22. R.R. Sharma and R.B. Pachori, Time-frequency representation using IEVDHM-HT with application to classification of epileptic EEG signals, *IET Science, Measurement & Technology*, vol. 12, issue 01, pp. 72-82, January 2018.
23. M. Sharma and R.B. Pachori, A novel approach to detect epileptic seizures using a combination of tunable-Q wavelet transform and fractal dimension, *Journal of Mechanics in Medicine and Biology*, vol. 17, no. 07, 1740003, 20 pages, November 2017.
24. P. Singh and R.B. Pachori, Classification of focal and non-focal EEG signals using features derived from Fourier-based rhythms, *Journal of Mechanics in Medicine and Biology*, vol. 17, no. 07, 1740002, 16 pages, November 2017.
25. R. Sharma, R.B. Pachori, and A. Upadhyay, Automatic sleep stages classification based on iterative filtering of electroencephalogram signals, *Neural Computing and Applications*, vol. 28, issue 10, pp. 2959-2978, October 2017.
26. D. Bhati, R.B. Pachori, and V.M. Gadre, A novel approach for time-frequency localization of scaling functions and design of three-band biorthogonal linear phase wavelet filter banks, *Digital Signal Processing*, vol. 69, pp. 309-322, October 2017.
27. M. Kumar, R.B. Pachori, and U.R. Acharya, Automated diagnosis of myocardial infarction ECG signals using sample entropy in flexible analytic wavelet transform framework, *Entropy*, vol. 19 (9), 488, pages 14, September 2017.
28. A. Bhattacharyya and R.B. Pachori, A multivariate approach for patient specific EEG seizure detection using empirical wavelet transform, *IEEE Transactions on Biomedical Engineering*, vol. 64, no. 09, pp. 2003-2015, September 2017.
29. S. Maheshwari, R.B. Pachori, V. Kanhangad, S.V. Bhandary, and U.R. Acharya, Iterative variational mode decomposition based automated detection of glaucoma using fundus images, *Computers in Biology and Medicine*, vol. 88, pp. 142-147, September 2017.
30. M.K. Saxena, S.D.V.S. Jagannadha Raju, R. Arya, R.B. Pachori, and S. Kher, Instantaneous area based on-line detection of bend generated error in a Raman optical fiber distributed temperature sensor, *IEEE Sensors Letters*, vol. 01, no. 4, article sequence no. 7000204, August 2017.

31. A. Upadhyay, M. Sharma, and R.B. Pachori, Determination of instantaneous fundamental frequency of speech signals using variational mode decomposition, *Computers and Electrical Engineering*, vol. 62, pp. 630-647, August 2017.
32. A.K. Tiwari, R.B. Pachori, V. Kanhangad, and B.K. Panigrahi, Automated diagnosis of epilepsy using key-points based local binary pattern of EEG signals, *IEEE Journal of Biomedical and Health Informatics*, vol. 21, issue 4, pp. 888-896, July 2017.
33. V. Gupta, T. Priya, R.B. Pachori, and U.R. Acharya, Automated detection of focal EEG signals using features extracted from flexible analytic wavelet transform, *Pattern Recognition Letters*, vol. 94, pp. 180-188, July 2017.
34. M. Sharma, R.B. Pachori, and U.R. Acharya, A new approach to characterize epileptic seizures using analytic time-frequency flexible wavelet transform and fractal dimension, *Pattern Recognition Letters*, vol. 94, pp. 172-179, July 2017.
35. M. Sharma, P.V. Achuth, R.B. Pachori, and V.M. Gadre, A parametrization technique to design joint time-frequency optimized discrete-time biorthogonal wavelet bases, *Signal Processing*, vol. 135, pp. 107-120, June 2017.
36. R. Sharma, M. Kumar, R.B. Pachori, and U.R. Acharya, Decision support system for focal EEG signals using tunable-Q wavelet transform, *Journal of Computational Science*, vol. 20, pp. 52-60, May 2017.
37. S. Maheshwari, R.B. Pachori, and U.R. Acharya, Automated classification of glaucoma using empirical wavelet transform and correntropy features extracted from fundus images, *IEEE Journal of Biomedical and Health Informatics*, vol. 21, no. 03, pp. 803-813, May 2017.
38. M. Sharma, A. Dhere, R.B. Pachori, and V.M. Gadre, Optimal duration-bandwidth localized antisymmetric biorthogonal wavelet filters, *Signal Processing*, vol. 134, pp. 87-99, May 2017.
39. A. Bhattacharyya, R.B. Pachori, A. Upadhyay, and U.R. Acharya, Tunable-Q wavelet transform based multiscale entropy measure for automated classification of epileptic EEG signals, *Applied Sciences*, vol. 7(4), 385, pages: 18, April 2017.
40. A.K. Tiwari, V. Kanhangad, and R.B. Pachori, Histogram refinement for texture descriptor based image retrieval, *Signal Processing: Image Communication*, vol. 53, pp. 73-85, April 2017.
41. A. Bhattacharyya, R.B. Pachori, and U.R. Acharya, Tunable-Q wavelet transform based multivariate sub-band fuzzy entropy with application to focal EEG signal analysis, *Entropy*, vol. 19 (3), 99, pages: 14, March 2017.
42. A. Upadhyay and R.B. Pachori, Speech enhancement based on mEMD-VMD method, *Electronics Letters*, vol. 53, issue 07, pp. 502-504, March 2017.
43. D. Bhati, M. Sharma, R.B. Pachori, and V.M. Gadre, Time-frequency localized three-band biorthogonal wavelet filter bank using semidefinite relaxation and nonlinear least squares with epileptic seizure EEG signal classification, *Digital Signal Processing*, vol. 62, pp. 259-273, March 2017.
44. M. Kumar, R.B. Pachori, and U.R. Acharya, Use of accumulated entropies for automated detection of congestive heart failure in flexible analytic wavelet transform framework based on short-time HRV signals, *Entropy*, 19 (3), 92, pages: 21, February 2017.
45. M. Sharma, A. Dhere, R.B. Pachori, and U.R. Acharya, An automatic detection of focal EEG signals using new class of time-frequency localized orthogonal wavelet filter banks, *Knowledge-Based Systems*, vol. 118, pp. 217-227, February 2017.
46. S. Patidar, R.B. Pachori, A. Upadhyay, and U.R. Acharya, An integrated alcoholic index using tunable-Q wavelet transform based features extracted from EEG signals for diagnosis of alcoholism, *Applied Soft Computing*, vol. 50, pp. 71-78, January 2017.
47. M. Kumar, R.B. Pachori, and U.R. Acharya, Characterization of coronary artery disease using flexible analytic wavelet transform applied on ECG signals, *Biomedical Signal Processing and Control*, vol. 31, pp. 301-308, January 2017.

48. D. Bhati, M. Sharma, R.B. Pachori, S.S. Nair, and V.M. Gadre, Design of time-frequency optimal three-band wavelet filter banks with unit Sobolev regularity using frequency domain sampling, *Circuits, Systems & Signal Processing*, vol. 35, issue 12, pp. 4501-4531, December 2016.
49. M. Kumar, R.B. Pachori, and U.R. Acharya, An efficient automated technique for CAD diagnosis using flexible analytic wavelet transform and entropy features extracted from HRV signals, *Expert Systems with Applications*, vol. 63, pp. 165-172, November 2016.
50. M. Sharma, D. Bhati, S. Pillai, R.B. Pachori, and V.M. Gadre, Design of time-frequency localized filter banks: Transforming non-convex problem into convex via semidefinite relaxation technique, *Circuits, Systems & Signal Processing*, vol. 35, issue 10, pp. 3716-3733, October 2016.
51. R.B. Pachori and A. Nishad, Cross-terms reduction in Wigner-Ville distribution using tunable-Q wavelet transform, *Signal Processing*, vol. 120, pp. 288-304, March 2016.
52. M.K. Saxena, S.D.V.S.J. Raju, R. Arya, R.B. Pachori, S.V.G. Ravindranath, S. Kher, and S.M. Oak, Empirical mode decomposition based detection of bend induced error and its correction in a Raman fiber distributed temperature sensor, *IEEE Sensors Journal*, vol. 16, no. 5, pp. 1243-1252, March 2016.
53. R.B. Pachori, M. Kumar, K. Shashank, P. Avinash, and U.R. Acharya, An improved online paradigm for screening of diabetic patients using RR interval signals, *Journal of Mechanics in Medicine and Biology*, vol. 16, no. 01, 1640003, 23 pages, February 2016.
54. S. Sood, M. Kumar, R.B. Pachori, and U.R. Acharya, Application of empirical mode decomposition-based features for analysis of normal and CAD heart rate signals, *Journal of Mechanics in Medicine and Biology*, vol. 16, no. 01, 1640002, 20 pages, February 2016.
55. O. Sahu, V. Anand, V. Kanhangad, and R.B. Pachori, Classification of magnetic resonance brain images using bi-dimensional empirical mode decomposition and autoregressive model, *Biomedical Engineering Letters*, vol. 5, issue 4, pp. 311-320, December 2015.
56. P. Jain and R.B. Pachori, An iterative approach for decomposition of multi-component non-stationary signals based on eigenvalue decomposition of the Hankel matrix, *Journal of the Franklin Institute*, vol. 352, issue 10, pp. 4017-4044, October 2015.
57. A.S. Hood, R.B. Pachori, V.K. Reddy, and P. Sircar, Parametric representation of speech employing multi-component AFM signal model, *International Journal of Speech Technology*, vol. 18, issue 03, pp. 287-303, September 2015.
58. R. Sharma, R.B. Pachori, and U.R. Acharya, An integrated index for the identification of focal electroencephalogram signals using discrete wavelet transform and entropy measures, *Entropy*, vol. 17, issue 8, pp. 5218-5240, July 2015.
59. A. Upadhyay and R.B. Pachori, Instantaneous voiced/non-voiced detection in speech signals based on variational mode decomposition, *Journal of the Franklin Institute*, vol. 352, issue 7, pp. 2679-2707, July 2015.
60. S. Patidar, R.B. Pachori, and U.R. Acharya, Automated diagnosis of coronary artery disease using tunable-Q wavelet transform applied on heart rate signals, *Knowledge Based Systems*, vol. 82, pp. 1-10, July 2015.
61. R.B. Pachori, P. Avinash, K. Shashank, R. Sharma, and U.R. Acharya, Application of empirical mode decomposition for the analysis of normal and diabetic RR-interval signals, *Expert Systems with Applications*, vol. 42, issue 9, pp. 4567-4581, June 2015.
62. S. Patidar, R.B. Pachori, and N. Garg, Automatic diagnosis of septal defects based on tunable-Q wavelet transform of cardiac sound signals, *Expert Systems with Applications*, vol. 42, issue 7, pp. 3315-3326, May 2015.
63. M.K. Saxena, S.D.V.S.J. Raju, R. Arya, R.B. Pachori, S.V.G. Ravindranath, S. Kher, and S.M. Oak, Empirical mode decomposition based dynamic error correction in SS covered 62.5/125 μm optical fiber based distributed temperature sensor, *Optics & Laser Technology*, vol. 67, pp. 107-118, April 2015.
64. R. Sharma, R.B. Pachori, and U.R. Acharya, Application of entropy measures on intrinsic mode functions for automated identification of focal electroencephalogram signals, *Entropy*, vol. 17, issue 2, pp. 669-691, February 2015.

65. R. Sharma and R.B. Pachori, Classification of epileptic seizures in EEG signals based on phase space representation of intrinsic mode functions, *Expert Systems with Applications*, vol. 42, issue 3, pp. 1106-1117, February 2015.
66. T.S. Kumar, V. Kanhangad, and R.B. Pachori, Classification of seizure and seizure-free EEG signals using local binary patterns, *Biomedical Signal Processing and Control*, vol. 15, pp. 33-40, January 2015.
67. M.K. Saxena, S.D.V.S.J. Raju, R. Arya, R.B. Pachori, S.V.G. Ravindranath, S. Kher, and S.M. Oak, Raman optical fiber distributed temperature sensor using wavelet transform based simplified signal processing of Raman backscattered signals, *Optics & Laser Technology*, vol. 65, pp. 14-24, January 2015.
68. S. Patidar and R.B. Pachori, Classification of cardiac sound signals using constrained tunable-Q wavelet transform, *Expert Systems with Applications*, vol. 41, pp. 7161-7170, November 2014.
69. P. Jain and R.B. Pachori, Event-based method for instantaneous fundamental frequency estimation from voiced speech based on eigenvalue decomposition of Hankel matrix, *IEEE/ACM Transactions on Audio, Speech and Language Processing*, vol. 22, issue 10, pp. 1467-1482, October 2014.
70. A. Parey and R.B. Pachori, Gear fault diagnosis based on central tendency measure of intrinsic mode functions, *International Journal of COMADEM*, vol. 17, no. 3, pp. 15-22, July 2014.
71. R.B. Pachori and S. Patidar, Epileptic seizure classification in EEG signals using second-order difference plot of intrinsic mode functions, *Computer Methods and Programs in Biomedicine*, vol. 113, issue 2, pp. 494-502, February 2014.
72. V. Joshi, R.B. Pachori, and A. Vijesh, Classification of ictal and seizure-free EEG signals using fractional linear prediction, *Biomedical Signal Processing and Control*, vol. 9, pp. 1-5, January 2014.
73. S. Patidar and R.B. Pachori, Constrained tunable-Q wavelet transform based analysis of cardiac sound signals, *AASRI Procedia*, vol. 4, pp. 57-63, 2013.
74. V. Bajaj and R.B. Pachori, Automatic classification of sleep stages based on the time frequency image of EEG signals, *Computer Methods and Programs in Biomedicine*, vol. 112, issue 3, pp. 320-328, December 2013.
75. S. Patidar and R.B. Pachori, Segmentation of cardiac sound signals by removing murmurs using constrained tunable-Q wavelet transform, *Biomedical Signal Processing and Control*, vol. 8, issue 6, pp. 559-567, November 2013.
76. P. Jain and R.B. Pachori, Marginal energy density over the low frequency range as a feature for voiced/non-voiced detection in noisy speech signals, *Journal of the Franklin Institute*, vol. 350, issue 4, pp. 678-716, May 2013.
77. V. Bajaj and R.B. Pachori, Epileptic seizure detection based on the instantaneous area of analytic intrinsic mode functions of EEG signals, *Biomedical Engineering Letters*, vol. 3, issue 1, pp. 17-21, March 2013.
78. V. Bajaj and R.B. Pachori, Classification of seizure and nonseizure EEG signals using empirical mode decomposition, *IEEE Transactions on Information Technology in BioMedicine*, vol. 16, no. 6, pp. 1135-1142, November 2012.
79. P. Jain and R.B. Pachori, Time-order representation based method for epoch detection from speech signals, *Journal of Intelligent Systems*, vol. 21, issue 1, pp. 79-95, February 2012.
80. A. Parey and R.B. Pachori, Variable cosine windowing of intrinsic mode functions: Application to gear fault diagnosis, *Measurement*, vol. 45, issue 3, pp. 415-426, April 2012.
81. R.B. Pachori and V. Bajaj, Analysis of normal and epileptic seizure EEG signals using empirical mode decomposition, *Computer Methods and Programs in Biomedicine*, vol. 104, issue 3, pp. 373-381, December 2011.
82. R.B. Pachori and D. Hewson, Assessment of the effects of sensory perturbations using Fourier-Bessel expansion method for postural stability analysis, *Journal of Intelligent Systems*, vol. 20, issue 2, pp. 167-186, August 2011.
83. A.F. Mohed, G. Rama Murthy, and R.B. Pachori, Novel orthogonal signal based decomposition of digital signals: Application to sensor fusion, *Sensors & Transducers*, vol. 114, issue 3, pp. 56-65, March 2010.

84. R.B. Pachori and P. Sircar, Analysis of multicomponent AM-FM signals using FB-DESA method, *Digital Signal Processing*, vol. 20, pp. 42-62, January 2010.
85. R.B. Pachori, Discrimination between ictal and seizure-free EEG signals using empirical mode decomposition, *Research Letters in Signal Processing*, vol. 2008, Article ID 293056, 5 pages, December 2008.
86. R.B. Pachori and P. Sircar, EEG signal analysis using FB expansion and second-order linear TVAR process, *Signal Processing*, vol. 88, no. 2, pp. 415-420, February 2008.
87. R.B. Pachori and P. Sircar, A new technique to reduce cross terms in the Wigner distribution, *Digital Signal Processing*, vol. 17, no. 2, pp. 466-474, March 2007.

Conference Papers:

1. V. Gupta, A. Nishad, and R.B. Pachori, Focal EEG signal detection based on constant-bandwidth TQWT filter-banks, *2018 IEEE International Conference on Bioinformatics and Biomedicine*, 03-06 December, 2018, Madrid, Spain
2. M. Tanveer, R.B. Pachori and N.V. Victoria, Entropy based features in FAWT framework for automated detection of epileptic seizure EEG signals, *2018 Symposium Series on Computational Intelligence*, 18-21 November, 2018, Bengaluru, India.
3. M. Tanveer, R.B. Pachori and N.V. Victoria, Classification of seizure and seizure-free EEG signals using Hjorth parameters, *2018 Symposium Series on Computational Intelligence*, 18-21 November, 2018, Bengaluru, India.
4. A. Nishad and R.B. Pachori, Instantaneous fundamental frequency estimation of speech signals using tunable-Q wavelet transform, *International Conferences on Signal Processing and Communications (SPCOM)*, July 16-19, 2018, Bangalore, India.
5. S. Gupta, K. Hari Krishna, R.B. Pachori, and M. Tanveer, Fourier-Bessel series expansion based technique for automated classification of focal and non-focal EEG signals, *International Joint Conference on Neural Networks (IJCNN)*, July 08-13, 2018, Rio, Brazil.
6. A. Bhattacharyya, L. Singh, and R.B. Pachori, Identification of epileptic seizures from scalp EEG signals based on TQWT, *International Conference on Machine Intelligence and Signal Processing*, December 22-24, 2017, Indore, India.
7. S. Shah, M. Sharma, D. Deb, and R.B. Pachori, An automated alcoholism detection using orthogonal wavelet filter bank, *International Conference on Machine Intelligence and Signal Processing*, December 22-24, 2017, Indore, India.
8. M. Sharma, P. Sharma, R.B. Pachori, and V.M. Gadre, Double density dual-tree complex wavelet transform based features for automated screening of knee-joint vibroarthrographic signals, *International Conference on Machine Intelligence and Signal Processing*, December 22-24, 2017, Indore, India.
9. R.R. Sharma, M. Kumar, and R.B. Pachori, Automated CAD identification system using time-frequency representation based on eigenvalue decomposition of ECG signals, *International Conference on Machine Intelligence and Signal Processing*, December 22-24, 2017, Indore, India.
10. R.R. Sharma, P. Chandra, and R.B. Pachori, Electromyogram signal analysis using eigenvalue decomposition of the Hankel matrix, *International Conference on Machine Intelligence and Signal Processing*, December 22-24, 2017, Indore, India.
11. M. Dalal, M. Tanveer, and R.B. Pachori, Automated identification system for focal EEG signals using fractal dimension of FAWT based sub-bands signals, *International Conference on Machine Intelligence and Signal Processing*, December 22-24, 2017, Indore, India.
12. V. Gupta and R.B. Pachori, A new method for classification of focal and non-focal EEG signals, *International Conference on Machine Intelligence and Signal Processing*, December 22-24, 2017, Indore, India.
13. D. Bhati, R.B. Pachori, and V.M. Gadre, Optimal design of three-band orthogonal wavelet filter bank with stopband energy for identification of epileptic seizure EEG signals, *International Conference on Machine Intelligence and Signal Processing*, December 22-24, 2017, Indore, India.

14. P. Gaur, R.B. Pachori, H. Wang, and G. Prasad, Comparison analysis: single and multichannel EMD based filtering with application to BCI, *International Conference on Machine Intelligence and Signal Processing*, December 22-24, 2017, Indore, India.
15. A. Bhattacharyya, V. Gupta and R.B. Pachori, Automated identification of epileptic seizure EEG signals using empirical wavelet transform based Hilbert marginal spectrum, *22nd International Conference on Digital Signal Processing*, August 23-25, London, United Kingdom.
16. V. Gupta, A. Bhattacharyya, and R.B. Pachori, Classification of seizure and non-seizure EEG signals based on EMD-TQWT method, *22nd International Conference on Digital Signal Processing*, August 23-25, London, UK.
17. M. Sharma, R.B. Pachori, and V.M. Gadre, A novel class of optimal time-frequency localized biorthogonal wavelet filter banks for automated identification of epileptic seizures, *International Symposium on Computational Mathematics, Optimization, and Computational Intelligence (CMOCI 2017)*, July 17 - 19, 2017, IIT Indore, Indore, India. (Abstract).
18. M. Tanveer, R.B. Pachori, and M. Dalal, Automated detection of EEG signal based on flexible analytic wavelet transform with an optimal signal length, *International Symposium on Computational Mathematics, Optimization, and Computational Intelligence (CMOCI 2017)*, July 17 - 19, 2017, IIT Indore, Indore, India. (Abstract).
19. P. Gaur, J.S. Bornot, G. Prasad, H. Wang, and R.B. Pachori, Decoding of multi-direction wrist movements using multivariate empirical mode decomposition, *MEG UK 2017*, March 22-24, 2017, Oxford, UK. (Poster).
20. G. Kaushik, P. Gaur, G. Prasad, H. Wang, and R.B. Pachori, An MEG based multi direction wrist movements analysis using empirical mode decomposition and multivariate empirical mode decomposition, *MEG UK 2016*, March 22-24, 2017, Oxford, UK. (Poster).
21. D. Joshi, A. Tripathi, R. Sharma, and R.B. Pachori, Computer aided detection of abnormal EMG signals based on tunable-Q wavelet transform, *International Conference on Signal Processing & Integrated Networks*, February 11-12, 2017, Noida, India.
22. R.R. Sharma and R.B. Pachori, A new method for non-stationary signal analysis using eigenvalue decomposition of the Hankel matrix and Hilbert transform, *International Conference on Signal Processing & Integrated Networks*, February 11-12, 2017, Noida, India.
23. S. Patidar and R.B. Pachori, Tunable-Q wavelet transform based optimal compression of cardiac sound signals, *IEEE Tencn Conference*, November 22-25, 2016, Singapore.
24. P. Gaur, R.B. Pachori, H. Wang, and G. Prasad, A multivariate empirical mode decomposition based filtering for subject independent BCI, *27th Irish Signals and Systems Conference*, June 21-22, 2016, Derry, UK.
25. P. Gaur, R.B. Pachori, H. Wang, and G. Prasad, Enhanced motor imagery classification in EEG-BCI using multivariate EMD based filtering and CSP features, *International Brain-Computer Interface (BCI) Meeting*, May 30th -June 3rd, 2016, California, USA.
26. P. Gaur, R.B. Pachori, H. Wang, and G. Prasad, An MEG based BCI for classification of multi direction wrist movements using empirical mode decomposition, *MEG UK 2016*, March 21-23, 2016, York, UK. (Poster).
27. A. Upadhyay and R.B. Pachori, A new method for determination of instantaneous fundamental frequency from speech signals, *IEEE Signal Processing and Signal Processing Education Workshop*, 09-12 August, 2015, Salt Lake City, Utah, USA.
28. P. Gaur, R.B. Pachori, H. Wang, and G. Prasad, An empirical mode decomposition based filtering method for classification of motor-imagery EEG signals for enhancing brain-computer interface, *The International Joint Conference on Neural Networks*, Killarney, Ireland, July 12 - 17, 2015.
29. R.B. Pachori, Automatic diagnosis of epilepsy using non-stationary signal decomposition based methods, *International Conference on Significant Advances in Biomedical Engineering*, Philadelphia, USA, April 27-29, 2015.
30. A. Mathur, N. Choudhary, A. Upadhyay, and R.B. Pachori, Detection of glottal closure instants from voiced speech signals using the Fourier-Bessel series expansion, *4th IEEE International Conference on Communication and Signal Processing*, Melmaruvathur, India, 2-4 April, 2015.

31. M. Shah, S. Saurav, R. Sharma, and R.B Pachori, Analysis of epileptic seizure EEG signals using reconstructed phase space of intrinsic mode functions, *9th IEEE International Conference on Industrial and Information Systems*, 15-17 December, 2014, Gwalior, India.
32. S. Patidar, R.B. Pachori, and N. Garg, Detection of septal defects from cardiac sound signals using tunable-Q wavelet transform, *IEEE International Conference on Digital Signal Processing*, 20-23 August, 2014, Hong Kong.
33. T.S. Kumar, V. Kanhangad, and R.B. Pachori, Classification of seizure and seizure-free EEG signals using multi-level local patterns, *IEEE International Conference on Digital Signal Processing*, 20-23 August, 2014, Hong Kong.
34. R.B. Pachori and J.-L. Kim, Comparison of the health care function by head movement, *The 1st International Conference on Contents, Platform, Network and Device*, 10 July-13 July, 2014, Pusan, Korea.
35. 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.
36. 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.
37. 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.
38. 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.
39. 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.
40. 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.
41. 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.
42. 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)
43. 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.
44. 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.
45. P. Jain and R.B. Pachori, A new method for glottal closure instants detection from speech signals, *5th Indian International Conference on Artificial Intelligence*, pp. 1216-1231, 14-16 December, 2011, Tumkur, India.
46. 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.
47. 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, February 17-18, 2011 (Abstract Issue of Journal of the Mississippi Academy of Sciences, vol. 56, no. 1, pp. 101, Jan 2011).

48. 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.
49. 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.
50. 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.
51. 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.
52. 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.
53. 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.
54. 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.
55. 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.
56. 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.
57. 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.
58. 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.
59. J. Qumar and R.B. Pachori, A novel technique for merging of multisensor and defocussed images using multiwavelets, *IEEE Tencon Conference*, pp. 1733-1738, 22-24 November, 2005, Melbourne, Australia.
60. 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.
61. 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.
62. 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 and Conference Organized:

1. Short-term course on signal and image processing, 30-31 May, 2015, Discipline of Electrical Engineering, Indian Institute of Technology Indore, Indore, India. (jointly 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. (jointly 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. (jointly with Prof. A. Parey).
4. International conference on machine intelligence and signal processing, December 22-24, 2017, Indian Institute of Technology Indore, Indore, India. (jointly 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. (jointly 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 (jointly with Prof. A. Parey).
7. GIAN course on ECG and EEG analysis: Recent advances and practical mini projects (jointly with Prof. P. Ramasamy (Foreign faculty) and Dr. M. Tanveer), Approved, 2018-2019.

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.
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.
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.
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, Autumn-2009, Spring-2011, Spring-2012, Spring-2013, Spring-2014, Spring-2015, Spring-2017, Spring-2018, Spring-2019.
8. Introduction to Electrical and Electronic Circuits (UG, EE 102), Spring-2010.
9. Communication Systems (UG, EE 307), Autumn-2011, Autumn-2012, Autumn-2013, Autumn-2014, Autumn-2015.
10. Experimental Engineering Lab (UG, IC 211), Autumn-2011.
11. Communications Lab (UG, EE 356), Spring-2012, Spring-2013, Spring-2017.
12. Speech Signal Processing (PG, EE 740), Spring-2015.
13. Wireless Communication (PG, EE 642), Spring-2016.
14. Image Processing (PG, EE 644), Spring-2017.

Post-Doctoral Research Supervision:

1. Manish Sharma, Automated classification of biomedical signals based on time-frequency localized wavelet filter banks, December 2015-December 2016.

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. (Raman-Charpak Fellowship).
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, December 2018. (Thesis submitted).

In Progress

1. Vipin Gupta, Automated classification of brain related signals.
2. Pradeep Chaudhary, Biomedical image processing.
3. Makam Kiran Kumar, Electroencephalogram signal processing.
4. Amrit Panda, Hyperspectral image processing for biomedical applications. (with Dr. Neeta Devi Sinnappah-Kang)
5. Shishir Maheshwari, Biomedical image analysis. (with Dr. V. Kanhangad).
6. Akanksha Tiwari, Cognitive Rehabilitation based on micro spatial parameters of video games. (with Dr. Sanjram Premjit Khanganba).
7. Dada Saheb Ramteke, Gear fault diagnosis based on advanced signal processing techniques. (with Prof. Anand Parey).
8. Rahul Sharma, Non-stationary signals models and their applications in biomedical signal processing. (at IIT Kanpur, with Prof. P. Sircar).
9. Arti Anuragi, Machine learning methods for classification of states of human brain. (at NIT Raipur, with Dr. Dilip Singh Sisodia).

M. Tech. Thesis Supervision:

Completed

1. Ashish Patwari, A proportional fair scheduling algorithm for cooperative transmission in OFDMA networks, July 2009. (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. (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).

In Progress

1. Preeti Meena, Non-stationary signal processing.
2. Rajat Katiyar, Non-stationary signal analysis methods.
3. Richa Singh, Biomedical signal processing.

B. Tech. Project Supervision:

Completed

1. Ronak Bajaj and Saransh Chhabra, Fourier-Bessel expansion based features for speaker identification, November 2009. (with Prof. R.N. Biswas)
2. Anamika Patel, Emotion recognition using EEG signals, May 2013.
3. Varun Joshi, Applications of fractional calculus in signal processing, May 2013. (with Dr. A. Vijesh)
4. Aakash Gupta, Deepak Yadav, and Pritesh Kanani, Vehicle license plate recognition, May 2013. (with Dr. R. Bodade)
5. Suhani and Manila Chaudhary, Classification of normal, seizure, and seizure-free EEG signals, May 2014.
6. Sachin Londhe, Kishan Soni, and Abhishek Kumar, Detection of human emotions based on EEG and ECG signals, May 2014.
7. Arvind Kumar Meena and Devendra Kumar Meena, Determination of instantaneous fundamental frequency from speech signals, May 2014.

8. Vimal Kumar Meena, Image enhancement using various filtering techniques, May 2014. (with Dr. A. Vijesh)
9. Sanjay Kumar Meena, Comparison study of image enhancement techniques, May 2014. (with Dr. A. Vijesh)
10. Rahul Shivaji Pawar, Design of adaptive doppler filter bank for ground based radars, May 2014.
11. Harish Padigala, Singular value decomposition based method for AM-FM signal enhancement, May 2014.
12. Pakala Avinash and Kora Shashank, Classification of normal and diabetic RR interval signals using empirical mode decomposition, May, 2015.
13. Shah Meet akshaykumar and Sumit Saurav, Classification of epileptic seizure EEG signals using reconstructed phase space of intrinsic mode functions, May, 2015.
14. Archit Mathur and Naveen Chaudhary, Detection of glottal closure instants from voiced speech signals using the Fourier-Bessel series expansion, May, 2015.
15. Abhinav Tripathi and Dhaivat Janmejy Joshi, Automated classification of abnormal EMG signals using tunable-Q wavelet transform, December, 2016.
16. Tanvi Priya and Abhishek Kumar Yadav, Computer-aided detection of non-focal and focal EEG signals using flexible analytic wavelet transform, December, 2016.
17. Swastik Gupta and Konduri Hari Krishna, Automated classification of focal and non-focal EEG signals using Fourier-Bessel series expansion, December, 2017. (with Dr. M. Tanveer).
18. Addepalli Hari Narayana, Infrared image processing for IoT module using NIR spectroscopy. (with Mr. Pravin Kumar Angolkar, Analog Devices India Pvt. Ltd., Bangalore).
19. Anmol Mansingh and Banka Nithin, Automated screening of sleep apnea from ECG signals using digital Taylor-Fourier transform, December, 2018.
20. Mayur Dahyabhai Chopda, Automated identification of human emotions based on non-stationary EEG signal processing, December, 2018.

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, 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.

Professional Activities:

Professional Affiliation

1. Senior Member, the Institute of Electrical and Electronic Engineers (IEEE)
2. Fellow, the Institution of Electronics and Telecommunication Engineers (IETE).

Reviewer in National and International Conferences

1. National Conference on Communications (NCC), 20-23 Feb, 2019, Bangalore, India.
2. International Conference on Signal Processing and Communications (SPCOM), 16-19 July, 2018, Bangalore, India.
3. National Conference on Communications (NCC), 25-28 Feb, 2018, Hyderabad, India.
4. National Conference on Communications (NCC), 02-04 March, 2017, Chennai, India.
5. National Conference on Communications (NCC), 04-06 March, 2016, Guwahati, India.
6. National Conference on Communications (NCC), 27 February, 2015 - 01 March, 2015, Bombay, India.
7. National Conference on Communications (NCC), 28 February, 2014 - 2 March, 2014, Kanpur, India.
8. National Conference on Communications (NCC), January 26-28, 2007, Kanpur, India.
9. National Conference on Communications (NCC), February 01-03, 2008, Mumbai, India.
10. European Signal Processing Conference (EUSIPCO), August 25-29, 2008, Lausanne, Switzerland.

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

Technical Program Committee Member

1. IEEE Tencon, November 19-21, 2008, Hyderabad, India.
2. Indian International Conference on Artificial Intelligence (IICAI), December 16-18 2009, Tumkur, India.
3. IEEE Symposium on Industrial Electronics & Applications (ISIEA), October 03-06, 2010, Penang, Malaysia.
4. IEEE International Conference on Electronic Devices, Systems & Applications (ICEDSA), April 25-27, 2011, Kuala Lumpur, Malaysia.
5. Indian International Conference on Artificial Intelligence (IICAI), December 14-16 2011, Tumkur, India.
6. International Conference on Signal, Image and Video Processing, January 13-15, 2012, Patna, India.
7. National Conference on Communications (NCC), 28 February, 2014 - 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, 2015 - 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), July 12-13, 2019, Wuhan, Hubei, China.
22. 1st 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), November 15-17, 2019, Jaypee University of Information Technology, Shimla, India.
24. 4th IEEE International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques (ICEECCOT-2018), 13-14 December, 2019, Mysuru, India.
25. 2nd International Conference on VLSI, Communication, and Signal Processing (VCAS 2019), Oct. 21-23, 2019, MNNIT Allahabad, Prayagraj, India.

Advisory Committee Member

1. International Conference on Emerging Trends in Signal Processing and VLSI Design, Hyderabad, June, 2010.
2. National Conference on Recent Advances in Science, Engineering and Management, Hyderabad, April, 2013.
3. International Conference on Computational Mathematics in Nanoelectronics and Astrophysics, Indore, November 1-3, 2018.
4. International Conference on Mathematical Modelling and Scientific Computing, Indore, July 19-21, 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, Inida.
7. International Symposium on Intelligent Sensing Systems-2017 (SISS 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), January 05-06, 2018, Indore, India.
12. International Conference on Recent Advances in Interdisciplinary Trends in Engineering and Applications, 14-16 February, 2019, Indore, Indore.
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. 3rd International Conference on Biomedical Engineering (ICOBEE 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), July 4-5, 2019, IITRAM, Ahmedabad, India.
20. 4th IEEE International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques (ICEECCOT-2018), 13-14 December, 2019, Mysuru, India.

Key Note Speaker

1. 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 (Topic: Time-frequency domain based signal processing)
2. 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 (Topic: Automated classification of electroencephalogram signals)
3. 2017 IEEE International Conference on Power, Control, Signals and Instrumentation Engineering (ICPCSI), 21-22 September, 2017, Chennai, India (Topic: EEG signal processing based on empirical wavelet transform)
4. 2017 International Conference on Current Trends in Computer, Electrical, Electronics and Communication (CTCEEC), 08-09 September, 2017, Mysore, India (Topic: Empirical wavelet transform based techniques for epilepsy diagnosis)
5. National Conference on Advances in Neuroimaging and Applications in Cognitive Disorders (ANACOD), 03-04 May, 2016, National Brain Research Center, Manesar, Haryana, India (Topic: Automated classification of EEG signals for computer-aided medical diagnosis)
6. Technosummit 2013, Sathyabama University, Chennai, India (Topic: Time-Frequency Methods)
7. Third National Seminar on Advance Techniques in Signal Processing and Communication, 28th November, 2014, LNCT, Indore, India (Topic: Detection of epileptic seizures from EEG signals)
8. National Conference on Emerging Trends in Electronics Engineering (NCETEE-2013), Bhopal, India (Topic: Time-frequency signal processing)
9. National Conference on Emerging Trends in Signal Processing and VLSI Design-2010, Bhopal, India (Topic: Signal analysis using wavelets)
10. National Conference on Recent Trends in Communication Engineering-2011, Indore, India (Topic: Time-frequency domain based methods)

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.

Session Chair/Track Chair/Tutorial 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, IIT Allahabad, India.
4. Tutorial chair at 23rd International Symposium on VLSI Design and Test (VDAT-2019), IIT Indore, India.

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, 41st EMB Conference 2019, July 23-27, Berlin, Germany.
6. Associate Editor: Electronics Letters (January 2019 to present)

Invited Lectures/Talks/Seminars Delivered:

1. Delivered lecture on Time-frequency analysis for gearbox fault diagnosis, A Short Term Course on Vibration Monitoring Techniques for Machinery Fault Diagnosis, Discipline of Mechanical Engineering, Indian Institute of Technology Indore, Indore, India, 18-19 March, 2019.
2. Delivered 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.
3. Delivered 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.
4. Delivered 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.

5. Delivered 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.
6. Delivered lecture on Automated analysis and classification of EEG signals, School of Medicine, Taylor's University, Subang Jaya, Malaysia, 28 January, 2019.
7. Delivered lecture on Signal processing in joint time-frequency domain, Veer Surendra Sai University of Technology, Burla, Odisha, India, 18 January, 2019.
8. Delivered 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 January, 2019.
9. Delivered lecture on Modern time-frequency analysis techniques, Jaypee University of Engineering and Technology, Guna, India, 12 January, 2019.
10. Delivered 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.
11. Delivered lectures on Classification of EEG signals, Short Term Course on Machine Learning, IIT Indore, India, 13-15 December, 2018.
12. Delivered lectures on Signal analysis and time-frequency signal processing, Three-Day Short Term Course on Research and Development in Condition Monitoring of Rotating Machines, IIT Indore, India, 06-12 December, 2018.
13. Delivered lectures on Signals and systems, Department of Electronics Engineering, Yeshwantrao Chavan College of Engineering, Nagpur, India, September 27-29, 2018.
14. Delivered lecture on MATLAB based time-frequency analysis, Faculty Development Programme on Numerical Algorithms and Programming using MATLAB under Electronics and ICT Academy, IIITDM Jabalpur, July 11-15, 2018.
15. Delivered 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, June 25-29, 2018; Phase 4, July 02-06, 2018, Indore, India.
16. Delivered lecture on Implementation of time-frequency analysis methods in MATLAB, One Week Faculty Development Programme on Programming and GUI Development using MATLAB, AITR Indore and IIITDM Jabalpur, June 11-15, 2018.
17. Delivered 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 2018-09 June 2018.
18. Delivered lecture on Time-frequency domain representation, TEQIP sponsored six-day short term course on Sustainable Water Resources Management under Changing Climate, Discipline of Civil Engineering, Indian Institute of Technology Indore, Indore, India, 28 May 2018-02 June 2018.
19. Delivered lectures on Basics of signal analysis, Two-Days Short Term Course on Bearing and Gear Fault Diagnosis under TEQIP-III, Discipline of Mechanical Engineering, Indian Institute of Technology Indore, Indore, India, March 26-27, 2018.
20. Delivered lectures on Digital signal processing, Department of Electronics Engineering, Yeshwantrao Chavan College of Engineering, Nagpur, India, February 01-03, 2018.
21. Delivered lectures on Peer-reviewed publications (Impact factor, H & I index, citation), Faculty Induction Workshops under TEQIP-III, IIT Indore, Indore, India, Phase A: January 17-21, 2018, Phase B: January 23-27, 2018, and Phase C: January 29-February 02, 2018.

22. Delivered 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, October 27, 2017.
23. Delivered guest lecture on Automated techniques for classification of EEG signals, International Institute of Information Technology, Allahabad, India, September 04, 2017.
24. Delivered guest lecture on Problems in biomedical signal processing, Department of Electronics and Electrical Engineering, Indian Institute of Technology Guwahati, Guwahati, India, August 24, 2017.
25. Delivered 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), IIT Indore, Indore, India, July 17 19, 2017.
26. Delivered invited talk on Speech signal processing based on variational mode decomposition, National Technical Research Organization, Government of India, New Delhi, India, July 04, 2017.
27. Delivered 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, April 08, 2017.
28. Delivered 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, December 19-23, 2016.
29. Delivered 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, November 04-05, 2016.
30. Delivered 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, August 21-23, 2016.
31. Delivered 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, August 21-23, 2016.
32. Delivered 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, July 10-12, 2016.
33. Delivered 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, March 18-23, 2016.
34. Delivered 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.
35. Delivered seminar on Features for automatic diagnosis of epilepsy from EEG signals, Aalto University, Helsinki, Finland, 30th October, 2015.
36. Delivered 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.
37. Delivered 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.
38. Delivered 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.

39. Delivered 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.
40. Delivered 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, February 22, 2014.
41. Delivered 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, January 28, 2014.
42. Delivered 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, October 05, 2013.
43. Delivered lecture on Time-frequency analysis, Military College of Telecommunication Engineering, Mhow, Indore, India, August 16, 2013.
44. Delivered lecture on Time-frequency methods for digital communications, STTP on Wireless Digital Communication, University Institute of Technology, Rajiv Gandhi Proudyogiki Viswavidyalaya, Bhopal, India, 17-21 June, 2013.
45. Delivered 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-453331, India, January 04-05, 2013.
46. Delivered 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, September 16-18, 2011.
47. Delivered talk on Wavelets, Department of Electronics and Communication Engineering, Acropolis Institute of Technology and Research Indore-453771, India, September 27, 2011.
48. Delivered 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.
49. Delivered seminar on Fourier-Bessel decomposition based methods for analysis of non-stationary signals, System Modeling and Dependability Laboratory, University of Technology of Troyes, Troyes, France, 16th April, 2007.

Administrative Experience:

1. Member (Academic), Board of Studies, Electronics & Communication, Electronics and Instrumentation and Electrical Engineering, Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore, India, March 2019 to present.
2. Assessor, National Assessment and Accreditation Council (NAAC), 03 December, 2018 to present.
3. Member, State Level Steering Committee, Department of School Education, Government of Madhya Pradesh from 29 August, 2018 to present.
4. External Member, Board of Studies, Electronics and Communication Engineering Department, Jaypee University of Engineering and Technology, Guna, India, July 2018 to present.
5. Senate Member, Indian Institute of Technology Indore, Indore, India, from 18 December, 2017 to present.
6. Convener, Discipline Seminar Committee, Discipline of Electrical Engineering, Indian Institute of Technology Indore, Indore, India, from 01 November, 2018 to present.
7. Expert Member, Board of Studies, Department of Biomedical Engineering, Shri G.S. Institute of Technology & Science, Indore, India, May 2018.
8. Member, Discipline Seminar Committee, Discipline of Electrical Engineering, Indian Institute of Technology Indore, Indore, India, from 02 February, 2017 to 31 October, 2018.

9. Time Table Coordinator, Discipline of Electrical Engineering, Indian Institute of Technology Indore, Indore, India, from 01 December, 2016 to present.
10. Nodal Officer, Rashtriya Avishkar Abhiyan, Scheme of MHRD, from 30 June, 2015 to present.
11. Convener of Scholarship-cum-Eligibility Committee, Indian Institute of Technology, Indore, India from 11 August, 2011 to 08 August 2017.
12. Convener of Discipline Under-Graduate Committees, Indian Institute of Technology, Indore, India from 12 July, 2013 to 30 June, 2017.
13. Course Coordinator of M. Tech. in Communications and Signal Processing, Indian Institute of Technology, Indore, India from April, 2013 to June, 2015.
14. Member of Transport Committee, Indian Institute of Technology, Indore, India from 17 July, 2012 to present.
15. Chairman of GATE, Indian Institute of Technology, Indore, India from 25 November, 2011 to 31 July, 2013.
16. Member of Institute Post Graduate Committee, Indian Institute of Technology, Indore, India from 05 February, 2013 to 12 July, 2013.
17. Member of School Post Graduate Committee, Indian Institute of Technology, Indore, India from 01 March, 2012 to 31 December, 2012.
18. Chairman of Rajbhasha Hindi Karyanbayan Samati, Indian Institute of Technology, Indore, India from 13 April, 2010 to 08 December, 2011.
19. Member of Timetable and Classroom Infrastructure Committee, Indian Institute of Technology, Indore, India from 01 April, 2010 to 21 May, 2012.
20. Member of Post Graduate Academic Performance Evaluation Committee, Indian Institute of Technology, Indore, India from 19 May, 2010 to 04 March, 2011.
21. Member of Under Graduate Academic Performance Evaluation Committee, Indian Institute of Technology, Indore, India from 19 March, 2010 to 04 March, 2011.
22. Member of Space, Transport, and Accommodation Committee, Indian Institute of Technology, Indore, India from 20 January, 2010 to 07 February, 2011.
23. Additional Warden of Old Boys Hostel, International Institute of Information Technology, Hyderabad, India from 03 April, 2009 to 01 December, 2009.

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