

Curriculum Vitae

- A. Name and full address:** Dr Maheshkumar Hanmant Kolekar,
Associate Professor, Electrical Engineering Department and
IIT Patna, Bihta, Patna -801103
Phone: 08986184240, maresh@iitp.ac.in, mkolekar@gmail.com
- B. Institution:** Indian Institute of Technology Patna
- C. Academic Qualification**

| Degree | Subject | Institution | Duration |
|----------------|--|---|-------------------|
| Ph D | Image Processing | E and ECE Dept, IIT Kharagpur | 2003-2007 |
| Postdoc Fellow | Biomedical Signal and Image Processing, Video Surveillance | Dept of Computer Science, University of Missouri, Columbia, MO, USA | 2008-2009 (2 yrs) |
| DAAD Fellow | EEG Signal Processing | TU Berlin, Germany | 2017 (May-July) |

D. Work experience

| Positions held | Name of the Institute | Date of joining | Date of leaving | Duration |
|---------------------|--|-----------------|-----------------|----------|
| Associate Professor | Electrical Engineering Department, IIT Patna | 29-03-2017 | Till date | 6 yrs |
| Assistant Professor | Electrical Engineering Department, IIT Patna | 16-03-2010 | 28-03-2017 | 7 yrs |

E. Research and Development projects executed successfully

| Sponsoring Agency | Title of Project | Period | Principal Investigator/ CoPI |
|---|---|------------|------------------------------|
| Principal Scientific Advisor Office, Govt of India, New Delhi | Real-time Abnormal Human Activity Recognition to Enhance Security | Two years | PI: Dr. M H Kolekar |
| Center of Advanced System Engineering, IIT Patna | Multimodal brain fingerprinting for Neuro-forensic applications: An advance approach in crime investigation | Two years | PI: Dr. M H Kolekar |
| DST New Delhi (under NM-ICPS) TIH IIT Patna | Real-time Anomaly Detection in Traffic Video Streams | Three year | PI: Dr M H Kolekar |

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|---|---|-----------|------------------------------|
| DST New Delhi (under NM-ICPS) TIH IIT Patna | Forensics analysis of video files for the possible existence of unauthorized manipulation | Two years | Co-PI: Dr M H Kolekar |
| Ministry of Home Affairs, Directorate of Forensic Science Services, Govt of India | CCTV Storage Media Recovery and Enhancement Software: AI-powered Cloud-capable Blockchain-based Digital Forensic Chain of Custody | Two years | PI: Dr M H Kolekar |

F. Administrative Experience at IIT Patna

| S N | Post | Organization/ University | Duration | | Total Experience |
|-----|--|--|-------------|-----------|------------------|
| | | | From | To | |
| 1. | Head | Electrical Engineering Dept, IIT Patna | Jan 2013 | Dec 2013 | 1 year |
| 2. | Head of the Center | Center for Advanced Systems Engineering, IIT Patna | Jan 2014 | May 2016 | 2 years 5 months |
| 3. | Associate Warden | IIT Patna | July 2010 | Dec 2012 | 2 years 6 months |
| 4. | Professor-in-charge | National Knowledge Network, IIT Patna | Aug 2017 | Sept 2019 | 2 years 1 month |
| 5. | Secretary DAPC, EE Dept | Departmental Academic Programme committee, IIT Patna | Mar 2018 | May 2024 | 4 years 2 months |
| 6. | Member IAPC | Institute Academic Programme Committee, IIT Patna | Jan 2013 | Dec 2013 | 3 year 6 months |
| | | | Mar 2018 | Jan 2024 | |
| 7. | Member of Senate | IIT Patna | Jan 2013 | Dec 2013 | 9 years |
| | | | Mar 2017 | Jan 2024 | |
| 8. | Member, Institute Security Committee | IIT Patna | May20, 2019 | Till date | 3 year 9 months |
| 9. | Coordinator M. Tech. Communication Systems Engineering | EE Dept, IIT Patna | July 2014 | July 2016 | 2 years |
| 10. | PhD Coordinator | EE Dept, IIT Patna | Jan | Dec | 1 years |

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|-----|---|-------------------|---------------|--------------|-----------------|
| | | | 2013 | 2013 | |
| 11. | Member, Governing Society | Incubation Center | 2015 | Till date | 7 years |
| 12. | Member, Merit-cum-Means Scholarship committee for UG students | IIT Patna | Jan 2022 | Till date | 5 months |
| 13. | Institute PhD Coordinator | IIT Patna | Sept 18, 2022 | Jan 12, 2024 | 1 year 3 months |

G. Ph.D Supervision at IIT Patna

| S N | Name of student | Title of Thesis | PhD | Year of Completion |
|-----|------------------|---|------------------------|--------------------|
| 1 | Abhishek Ray | Skeleton-based activity Recognition and Super-Resolution for Image Restoration using Graph Neural Network and Transformers. | Electrical Engineering | May 2024 |
| 2 | Nazia Aslam | Video Anomaly Detection Using Deep Autoencoder and Generative Adversarial Networks | Electrical Engineering | Dec 2023 |
| 3 | Neelam Sharma | Early Dementia Diagnosis using EEG Signal Processing in Cognitive Paradigm | Electrical Engineering | June 2021 |
| 4 | Deba Prasad Dash | Machine Learning Techniques for Epileptic Seizure Detection using Clinical EEG Databases | Electrical Engineering | Oct 2020 |
| 5 | Chandan K Jha | ECG Data Compression Schemes with Validation by Using Cardiac Arrhythmia | Electrical Engineering | Aug 2019 |
| 6 | Alok Kumar Verma | An Intelligent Techniques for Fault Diagnosis of Induction Motor using Multi-Scale Entropy | Electrical Engineering | Jan 2015 |
| 7 | Samprit Bose | Deep Learning Based Anomaly detection in traffic video sequences | Electrical Engineering | On-going |
| 8 | Agnes Yadav | Deep Learning for Medical Image Segmentation and Classification | Electrical Engineering | On-going |
| 9 | Kunjalik Sarkar | EEG Based Early Neurological Disorder Like ADHD And LLD Detection | Electrical Engineering | On-going |

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|---|----------|---|-------------------------|---------------------|
| 9 | Akanksha | Fake Video Detection Using Deep Learning for Forensic Application | Computer Science & Engg | On-going (Co-guide) |
|---|----------|---|-------------------------|---------------------|

H. M Tech Supervision at IIT Patna

| S N | Name of student | Title of Thesis | M. Tech | Year of Completion |
|-----|-------------------|--|----------------------------|--------------------|
| 1 | Hemang D Chhatbar | Dynamic Object Detection and Tracking in Autonomous Mobility | Mechatronics Engineering | On-going |
| 2 | Ashish Raj | License plate detection with low light enhancement using Diffusion Model | Communication Systems Engg | On-going |
| 3 | Komal Chandra | Retinal Diabetes Detection using Deep Learning | Communication Systems Engg | On-going |
| 4 | Vikash Kumar | Deep learning-based vehicle detection and tracking system | Part-time | On-going |
| 5 | Kishan | Skeleton-based Human Activity Recognition using Graph Neural Networks | Communication Systems Engg | June 2024 |
| 6 | Gaurav Kumar | Enhancing Image Contrast and Image Super-Resolution using Energy Curve Equalization and Transformers | Communication Systems Engg | June 2024 |
| 7 | Rajni Rajpoot | Plant Leaf Disease Detection Using Deep Learning | Communication Systems Engg | June 2024 |
| 8 | Aditya Jaiswal | Prostate Cancer Detection Using Deep Learning | Mechatronics Engineering | June 2024 |
| 9 | Rishi | Transformer-based Vehicle Re-identification for traffic video surveillance | Communication Systems Engg | June 2023 |
| 10 | Shubham | Human Activity Recognition using convolutional LSTM | VLSI and Embedded System | June 2022 |
| 11 | Priyesh D Hemrom | Fall Detection for Elderly Patients using Deep Learning techniques | Mechatronics Engg | June 2022 |
| 12 | A. Nagarani | Automated detection of | Communication | June 2022 |

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|----|---------------------|--|----------------------------|-----------|
| | | diabetic subject using deep learning methodology | Systems Engg | |
| 13 | B Keerthi Tejaswini | Coronary artery disease prediction using ECG and PCG | Communication Systems Engg | June 2022 |
| 14 | Vipul Kumar Singh | A Hybrid CNN-SVM Architecture for Automated Screening of COVID-19 Using Enhanced Chest CT Images | Communication Systems Engg | June 2021 |
| 15 | Kunchankara Alekhya | Automated Diabetes Detection and Management Using ECG Parameters for Remote Health Monitoring | Communication Systems Engg | June 2021 |
| 16 | Neha Kumari | Object Detection using Deep Learning Techniques | VLSI and Embedded System | June 2021 |
| 17 | Shani Ranjan | Design of new class of FIR interpolation filters by phase interleaving | VLSI and Embedded System | June 2021 |
| 18 | Aradhana Kumari | Study and Design of Time Skew Mismatch Calibration Architecture for Time Interleaved ADC | VLSI and Embedded Systems | June 2020 |
| 19 | Vishal Waghmare | Spinal Cord Image Segmentation for Diagnosis | Communication Systems Engg | June 2020 |
| 20 | Tarun Kumar Singh | An Autonomous Path Finding Algorithm for Robot Using Computer Vision Techniques | Mechatronics Engg | June 2020 |
| 21 | Lokesh Kumar | Video Context Description for Visually Impaired Person using Deep Learning Algorithm | Mechatronics Engg | June 2020 |
| 22 | Abhishek Kumar | Real-time Hand Gesture Recognition for Robotic Arm using Image Processing Techniques | Mechatronics Engg | June 2020 |
| 23 | Kanika Choudhary | Sparse Combination Learning for Abnormal Activity Detection | Mechatronics Engg | July 2018 |

| | | | | |
|----|----------------------|--|-----------------------------------|-----------|
| 24 | Md Iqbal Ashraf | ECG Signal Compression Using Singular Value Decomposition | Communication Systems Engg | July 2018 |
| 25 | Manish Kumar Mahto | ECG signal compression based on Empirical Mode Decomposition | Communication Systems Engg | May 2017 |
| 26 | Rashmi Sweta Hembrom | EEG Signal Analysis | Communication Systems Engg | May 2017 |
| 27 | Om Prakash Pal | EEG Signal Based Epileptic Seizure detection using SVM Classifier | Communication Systems Engg | May 2016 |
| 28 | Nishant Bharti | Detection of Fence Climbing Activity Using Support Vector Machine Classifier | Communication Systems Engineering | May 2016 |
| 29 | Veer Amol Motinath | ECG compression based on DCT and DWT | Mechatronics Engg | May 2016 |
| 30 | Neelabh Keshav | Far-field based Human action recognition for video surveillance | Communication Systems Engineering | May 2015 |
| 31 | Kapil Gupta | Primary Object Extraction in Videos through Layered Directed Acyclic Graph Structure | Mechatronics Engg | May, 2014 |

I. Publications (List of only important and recent publications)

Papers in International Journals

2025

1. A. C. Yadav, M. H. Kolekar, M. K. Zope "Modified Recurrent Residual Attention U-Net model for MRI-based brain tumor segmentation " Biomedical Signal Processing and Control. 2025 (IF: 4.9).

2024

2. A.C. Yadav, M.H. Kolekar, Y. Sonawane, G. Kadam, S. Tiwarekar, D.R. Kalbande, "EffUNet++: A Novel Architecture for Brain Tumor Segmentation Using FLAIR MRI Images", IEEE Access. 2024 (IF: 3.4).

3. N. Aslam, M. H. Kolekar, "TransGANomaly: Transformer based Generative Adversarial Network for video anomaly detection", **Elsevier Journal of Visual Communication and Image Representation**, 2024 (IF: 2.6).
4. N. Aslam, M. H. Kolekar, "DeMAAE: deep multiplicative attention-based autoencoder for identification of peculiarities in video sequences", **The Visual Computer**, Springer, 2024 (IF: 3.0).
5. M. H. Kolekar, S. Bose and A. Pai, "SARain-GAN: Spatial Attention Residual UNet Based Conditional Generative Adversarial Network for Rain Streak Removal," **IEEE Access**, vol. 12, pp. 43874-43888, 2024 (IF: 3.4).
6. Nazia Aslam, Rishi Kishore, M H Kolekar, "*PATReID: Pose Apprise Transformer Network for Vehicle ReIdentification*", **IEEE Transactions on Emerging Topics in Computational Intelligence**, 2024 (IF: 5.3).
7. A. Ray, N. Aslam, M. H. Kolekar, "A2SN: attention based two stream network for sports video classification", **Multimedia Tools and Applications**, 2024 (IF: 3.0).
8. D. P. Dash, M. H. Kolekar, C. Chakraborty, M. R. Khosravi, "Review of machine and deep learning techniques in epileptic seizure detection using physiological signals and sentiment analysis", **ACM Transactions on Asian and Low-Resource Language Information Processing**, 2024 (IF: 2.0).

2023

9. S. Bose, S. Nawale, D. Khut and M. H. Kolekar, "*LumiNet: Multispatial Attention Generative Adversarial Network for Backlit Image Enhancement*," **IEEE Transactions on Instrumentation and Measurement**, vol. 72, pp. 1-14, 2023 (IF: 5.6).
10. S. Bose, M. H. Kolekar, S. Nawale and D. Khut, "*LoLTV: A Low Light Two-wheeler Violation Dataset with Anomaly Detection Technique*," **IEEE Access**, vol 11, 2023 (IF: 3.4).
11. A Ray, M H Kolekar, "Transfer learning and its extensive appositeness in human activity recognition: A survey", **Elsevier Journal on Expert Systems with Applications**, 122538, 2023 (IF: 7.5).
12. Nazia Aslam, M H Kolekar, "DeMAAE: Deep Multiplicative Attention-based Autoencoder for Identification of Peculiarities in Video Sequences", **The Visual Computer**, Springer Journal, 2023 (IF: 3.0).

13. Abhisek Ray, M. H. Kolekar, R. Balasubramanian, and A. Hafiane, “*Transfer Learning Enhanced Vision-based Human Activity Recognition: A Decade-long Analysis*”, *Int Journal of Information Management Data Insights*, Elsevier, 3(1), 100142, 2023 (IF: 10.5).
14. S K Srikantrao, M H Kolekar, Roshan J Martis, “*Atrial fibrillation detection using Poincare geometry and heart beat intervals*”, **Expert Systems**, Wiley, 2023 (IF: 1.5).

2022

15. N Aslam, M H Kolekar, “*A3N: Attention-based adversarial autoencoder network for detecting anomalies in video sequence*”, **Elsevier, Journal of Visual Communication and Image Representation**, 2022 (IF: 2.6).
16. N Aslam, M H Kolekar, “*Unsupervised Anomalous Event Detection Using Interfused Autoencoder*”, *Multimedia Tools and Applications*, 2022, (Springer) (IF: 3.0).
17. Pranesh G, M H. Kolekar, “*Automatic song indexing by predicting listener’s emotion using EEG correlates and multi-neural networks*” **Multimedia Tools and Applications**, 2022, (Springer) (IF: 3.0).
18. D P Dash, M H Kolekar, C Chakraborty, and M R Khosravi, “*Review of Machine and Deep Learning Techniques in Epileptic Seizure Detection using Physiological Signals and Sentiment Analysis*”. **Transactions on Asian and Low-Resource Language Information Processing**, 2022 (IF: 1.5).
19. V K Singh, M H Kolekar, “*Deep Learning Empowered COVID-19 Diagnosis Using Chest CT Scan Images for Collaborative Edge-Cloud Computing Platform*”, *Springer Journal on Multimedia Tools and Applications*, 2022 (IF: 3.0).
20. G Patil, P Dutta, G Sakarkar, M H Kolekar, K Paithankar, “*Novel Approach for DNS Tunneling Attack Detection Using Image Classification*”, **Neuroscience Informatics**, (Elsevier), 2022

2021

21. Neelam, M H Kolekar, and K Jha, “*EEG based Dementia Diagnosis using Multi-class Support Vector Machine with Motor Speed Cognitive Test*”, **Biomedical Signal Processing and Control**, Elsevier, vol 63, 2021. (IF: 4.9)
22. D P Dash, M H. Kolekar, and Kamlesh Jha. “*Surface EEG based epileptic seizure detection using wavelet-based features and dynamic mode decomposition power*

along with KNN classifier" **Multimedia Tools and Applications**, Springer, pp 1-21, 2021 (IF: 3.0)

23.C. K. Jha and M H Kolekar, "*Tunable Q-Wavelet based ECG Data Compression with Validation using Cardiac Arrhythmia Patterns*", **Biomedical Signal Processing and Control**, Elsevier, 2021. (IF 4.9)

24.C. K. Jha, and M H Kolekar, "*Empirical Mode Decomposition and Wavelet Transform based ECG Data Compression Scheme*", **Journal on Innovation and Research in Biomedical Engineering**, Elsevier, Vol 42 (1), pp 65-72, 2021 (IF 5.6)

25.M H Kolekar, C K Jha, P Kumar, "*ECG Data Compression Using Modified Run Length Encoding of Wavelet Coefficients for Holter Monitoring*", **Journal on Innovation and Research in Biomedical Engineering**, Elsevier, 2021 (IF 5.6)

2020

26.Neelam, M H Kolekar, K Jha, "*Iterative Filtering Decomposition based Early Dementia Diagnosis using EEG with Cognitive Tests*", **IEEE Transactions on Neural Systems & Rehabilitation Engineering**, Vol. 28 (9), pp 1890-1898, 2020 (IF 4.8)

27.D P Dash, M H Kolekar, K Jha, "*Multi-channel EEG based automatic epileptic seizure detection using iterative filtering decomposition and hidden Markov model*", **Computers in Biology and Medicine**, Elsevier, 2020 (IF 7.0)

28.C K Jha, and M H. Kolekar, "*Cardiac arrhythmia classification using tunable Q-wavelet transform based features and support vector machine classifier*", **Biomedical Signal Processing and Control**, Elsevier, vol 59, 2020. (IF 4.9)

2019

29.C K Jha, and M H. Kolekar, "*Diagnostic quality assured ECG signal compression with selection of appropriate mother wavelet for minimal distortion*", **Science, Measurement and Technology**, IET, 2019. (IF 2.23)

30.N Sharma, M H Kolekar, K Jha, Y Kumar, "*EEG and cognitive biomarkers based mild cognitive impairment diagnosis*", **Journal on Innovation and Research in Biomedical Engineering (Elsevier)**, vol 40(2), pp. 113-121, 2019 (IF 5.6)

2018

31.C. K. Jha and M H Kolekar, "*Electrocardiogram data compression using DCT based discrete orthogonal Stockwell transform*", **Biomedical Signal Processing and Control (Elsevier)**, vol 46, pp 174-181, 2018. (IF 4.9)

2017

32. D Dhane, M Maiti, T Mungle, C Bar, A Achar, M H Kolekar, C Chakraborty, "*Fuzzy spectral clustering for automated delineation of chronic wound region using digital images*", Computers in Biology and Medicine (**Elsevier**), vol 89, pp 551-560, 2017 (IF 7.0)

2016

33. A K Verma, S Sarangi and M. H. Kolekar, "*Misalignment Faults Detection in Induction Motor Based on Multiscale Entropy and Artificial Neural Network*", Electric power Components and Systems (**Taylor and Francis**), vol 44 (8), 916-927, 2016. (IF 1.9)

2015

34. M. H. Kolekar and S. Sengupta, "*Bayesian Network Based Customized Highlight Generation for Broadcast Soccer Videos*", **IEEE Transaction on Broadcasting**, Vol 61(2), pp 195-209, 2015. (IF 3.2)

2014

35. A K Verma, S Sarangi and M. H. Kolekar, "*Stator winding fault prediction of induction motors using multiscale entropy and grey fuzzy optimization methods*" Computers and Electrical Engineering (**Elsevier**), vol 40 (7), pp 2246-2258, 2014. (IF 4.0)
36. A. K. Verma, S. Sarangi, M. H. Kolekar, "*Experimental Investigation of Misalignment Effects on Rotor Shaft Vibration and on Stator Current Signature*", Journal of Failure Analysis and Prevention (**Springer**), Vol. 14, No. 2, pp. 125-138, 2014. (IF 0.9)
37. A. K. Verma, S. Sarangi, M. H. Kolekar, "*Multi-scale Entropy Based Fault Detection of Broken Rotor Bar using Support Vector Machine*", Procedia Engineering (**Elsevier**), 2014. (IF 1)

2011

38. M. H. Kolekar, "*Bayesian Belief Network based broadcast sports video indexing*", Multimedia Tools and Applications (**Springer**), Vol-54 (1), 27-54, 2011 (IF 3.0)

2010

39. M. H. Kolekar, S. Sengupta, "*Semantic Concept Mining in Cricket Videos for Automated Highlight Generation*", Multimedia Tools and Applications (**Springer**), Vol-47 (3), 545-579, 2010. (IF 3.0)

Papers in Indian Journals

1. D P Dash, and M H. Kolekar. "*EEG Based Epileptic Seizure Detection Using Empirical Mode Decomposition and Hidden Markov Model*" Indian Journal of Public Health Research & Development 8, no. 4, 2017.
2. N Sharma, M H. Kolekar, Sushil Chandra, "*Synthetic Perception: New Era of Virtual Reality in Mental Health Care*", CSI communication, August 2016.
3. G Singh, M. H. Kolekar, "*A Distributed Weighted Voting Approach for Accurate Eye Center Estimation*", Defence Science Journal, 2013.
4. M. H. Kolekar, "*Hidden Markov Model based Highlight Generation of Cricket Video Sequence using Video and Audio Cues*", CSI Communications, vol. 28 (7), pp. 25-26, Jan 2005. **(Received Best Paper award)**.
5. M. H. Kolekar, "*An Algorithm for Designing Optimal Gabor Filter for Segmenting Multi-textured Images*", IETE Journal of Research, India, vol. 48 (3-4), pp. 181-187, 2002.
6. M. H. Kolekar, S. N. Talbar and T. R. Sontakke, "*Texture Segmentation using Fractal Signature*", IETE Journal of Research, India, vol. 46 (5), pp. 319-323, Jan 2000.

Papers in International Conferences

2025

1. A. Ray, A. Raj and M. H. Kolekar, "Autoregressive Adaptive Hypergraph Transformer for Skeleton-Based Activity Recognition," 2025 IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), Tucson, AZ, USA, 2025.

2024

2. A. Ray, G. Kumar, M. H. Kolekar, "CFAT : Unleashing Triangular Windows for Image Super-Resolution" in Proc. IEEE/CVF Conf. Compute. Vis. Pattern Recognit. (CVPR), June 2024 (**H5-Index: 422**).
3. A. C. Yadav, S. Bose and M. H. Kolekar, "Image Enhancement by Defogging utilizing Scene Specific Dark Channel Prior," IEEE International Students' Conference on Electrical, Electronics and Computer Science (SCEECS), Bhopal, India, 2024.

4. A.C. Yadav, M. H. Kolekar, M. K. Zope, "ResNet-101 Empowered Deep Learning for Breast Cancer Ultrasound Image Classification." 17th International Joint Conference on Biomedical Engineering Systems and Technologies – BIOSIGNALS, 2024

2023

5. Deba P Dash, M H Kolekar, E Mishra, "*EEG-based Epileptic Seizure Detection Using Deep Learning and Machine Learning Mode*", 23rd Int Conference on Hybrid Intelligent Systems, 2023
6. Neha Sathe, Anil Hiwale, M H Kolekar, Archana Ranade, "*Recognizing the Pervasiveness of Neurological Disorders Using a Gait Monitoring Approach*", 23rd Int Conference on Hybrid Intelligent Systems, 2023
7. K. Shah, A. Joshi, S. Bose, M.H. Kolekar. "*Accessory Based Classification of Football Players using Attention UNet*", Int Conf on Advancement in Electronics & Communication Engineering (AECE), 2023.
8. A. Pai, A. Raotole, S. Shirodkar, S. Bose, M.H. Kolekar. "*From Pixels to Prognosis: Exploring Convolutional Neural Networks for Cassava Leaf Disease Diagnosis*", Int Conf on Information Technology (OCIT), 2023.
9. M. Zope, A. C. Yadav, S. K. Diwakar, S. Bose, M. H. Kolekar, "*Deep Learning-Based Breast Cancer Classification Using Mammogram Images: A ResNet-50 Approach*", 28th Int Conf on Nuclear Tracks and Radiation Measurements (ICNTRM), 2023
10. Nazia Aslam, Maheshkumar H. Kolekar, "*A-VAE: Attention based Variational Autoencoder for Traffic Video Anomaly Detection*", IEEE 8th Int Conf on Convergence in Technology (I2CT), 2023.

2022

11. Bose, S., Ramesh, C.D. and Maheshkumar H Kolekar, "*Vehicle Classification and Counting for Traffic Video Monitoring Using YOLO-v3*" Int Conf on Connected Systems and Intelligence (CSI) (pp. 1-8). IEEE, 2022.
12. Nazia Aslam, Maheshkumar H. Kolekar, "*A Probabilistic Approach for Detecting Human Motion in Video Sequence using Gaussian Mixture Model*", Int Conf on Emerging Frontiers in Electrical and Electronic Technologies (ICEFEET), IEEE, 2022.
13. Rishi Kishore, Nazia Aslam, Maheshkumar H. Kolekar, "*Vehicle ReID: Learning Robust Feature using Vision Transformer and Gradient Accumulation for*

Vehicle Re-identification", Int Conf on Computer Vision and Image Processing (CVIP), Springer, 2022.

14. Nazia Aslam, Priyesh D. Hemrom, Maheshkumar H. Kolekar, "Attention-guided Human Fall Detection for Elderly Patient Monitoring", Int Conf on Communication and Intelligent Systems. Springer, 2022.

2020

15. P Bhandari, M Wu, Nazia Aslam, SK Lam, Maheshkumar H. Kolekar, "Efficient Sparse to Dense Stereo Matching Technique", Int Conf on Computer Vision and Image Processing (CVIP), Springer, 2020.

2019

16. D P Dash, M H Kolekar, "EEG based Epileptic Seizure Detection using Least Square SVM with Spectral and Multi-scale Key Point Energy Features", Int Conf on Soft Computing for Problem Solving, Springer, 2019.

2018

17. D.P.Dash, M.H.Kolekar, "Probability-Based Approach for Epileptic Seizure Detection Using Hidden Markov Model", 4th International Symposium SIRS 2018, Bangalore, India, September 19–22, 2018 (Received Best Paper Award)

18. D Ghosal, M H Kolekar, "Music Genre Recognition Using Deep Neural Networks and Transfer Learning", 19th annual International INTERSPEECH Conf, 2018.

19. D P Dash, and M H. Kolekar, "Dense Optical Flow Trajectory-Based Human Activity Recognition Using Hierarchical Hidden Markov Model." Int Conf on Computer Vision & Image Processing (CVIP), Springer, Singapore, pp. 103-116. 2018.

2017

20. D P Dash, M H Kolekar, "EEG based Epileptic Seizure Detection using Empirical Mode Decomposition and Hidden Markov Model", Symhealth, 2017. (Received Best Paper Award)

21. S Bhatnagar, D Ghosal, M. H. Kolekar, "Classification of Fashion Article Images using Convolutional Neural Networks", Int. Conf. on Image Information Processing, Jaypee University, Solan, Simla, Dec 2017 (citations: 99).

22. Swati, Sparha M, D Devendra, S Chatterjee, M. H. Kolekar, "An efficient GMM and active contour based unsupervised person re-identification" Int. Conf. on Advances in Computing, Communications and Informatics, 2017.

2016

- 23.M.H. Kolekar, D. P. Dash and P. N. Patil, "*Support Vector Machine based Extraction of Crime Information in Human Brain using ERP Image*" Int. Conf. on Computer Vision and Image Processing (**CVIP**), 2016.
- 24.C K Jha, M. H. Kolekar, "*Efficient ECG data compression and transmission algorithm for Telemedicine*", Int Conf on COMmunication Systems and NETworkS (**COMSNETS**), 2016.
- 25.S Chatterjee, P Bhandari, M. H. Kolekar, "*A Novel Krawtchouk Moment Zonal Feature Descriptor for User-independent Static Hand Gesture Recognition*", IEEE Int Conf TENCON, 2016.
26. M. H. Kolekar, D P Dash, "*Hidden Markov Model Based Human Activity Recognition using Shape and Optical Flow Based Features*", IEEE Int Conf TENCON, 2016.

2015

- 27.M. H. Kolekar, D P Dash, "*A Nonlinear Feature Based Epileptic Seizure Detection using Least Square Support Vector Machine Classifier*" IEEE TENCON, 2015.
- 28.C K Jha, M. H. Kolekar, "*Performance Analysis of ECG Data Compression using Wavelet Based Hybrid Transform Method*", Int Conf on Microwave, Optical and Communication Engineering (ICMOCE), IIT Bhubaneswar, 2015.
- 29.M. H. Kolekar, Abhinash K. Jha, Apurva Singh, Sneha Srivastava, "*A Mask based approach for Lossless Color Image Steganography*", 21st American Conf on Information Systems, Puerto Rico, USA, August 2015

2014

- 30.Abhishek Kumar, M. H. Kolekar, "*Machine Learning Approach for Epileptic Seizure Detection Using Wavelet Analysis of EEG Signals*", Int. Conf. on Medical Imaging, M-health and Emerging Communication Systems, 2014

2012

- 31.M. H. Kolekar, H. Rai, L Raja, Anamika Prasad, "*Image Based Arterial Wall Thickness Estimation for Abdominal Aortic Aneurysm Rupture Risk Analysis*", 4th Int Congress on Computational Mechanics and Simulation, IIT Hyderabad, 2012.
- 32.A K S Kushwaha, O Prakash, A Khare, M H Kolekar, "*Rule based human activity recognition for surveillance system*", 4th Int Conf on Intelligent Human Computer Interaction (IHCI), 2012.

2009

- 33.M. H. Kolekar, K. Palaniappan, S. Sengupta, “*Video Event Detection and Semantic Identification Using Bayesian Belief Networks*”, IEEE Int. Conf. on Computer Vision (ICCV) workshop, Kyoto, Japan, Sept 2009.

2008

- 34.M. H. Kolekar, K. Palaniappan, “*A Hierarchical Framework for Semantic Scene Classification in Soccer Sports Video*”, IEEE Int Conf. TENCON, India, 2008.
- 35.M. H. Kolekar, K. Palaniappan and S. Sengupta, “*A Novel Framework for Semantic Annotation of Soccer Sports Video Sequences*”, IET European Conf on Visual Media Production (CVMP), London, UK, 2008.

2006

- 36.M. H. Kolekar, S. Sengupta, “*A Hierarchical Framework for Generic Sports Video Classification*”, Asian Conf on Computer Vision (ACCV), Hyderabad, India, 2006.
- 37.M. H. Kolekar, S. Sengupta, “*Event-importance based customized and automatic cricket highlight generation*”, IEEE Int. Conf. on Multimedia and Expo (ICME), 2006.

2005

- 38.M. H. Kolekar, S. Sengupta, “*Hierarchical structure for audio-video based semantic classification of sports video sequences*”, SPIE Int. Conf. on Visual Communications and Image Processing (VCIP), SPIE-5960/ 401-409, Beijing, China, 2005.

Papers in National Conferences

1. A Ray, M H Kolekar, “*Skeleton-Based Action Recognition Using Graph Convolution and Cross-Domain Transfer Learning*”, National Conference on Communication, (NCC), 2024
2. D. R. Chavan and M. H. Kolekar, "Conversion of Hand Gesture to Speech for Speech Impaired People," 2022 IEEE 19th India Council International Conference (INDICON), Kochi, India, 2022
3. M. H. Kolekar, “*Hidden Markov Model based Highlight Generation of Cricket Video Sequence using Video and Audio Cues*”, Computer Society of India’s Conf on IT++: The Next Generation, pp. 249-258, India, Dec 2004 [**Received best PhD student paper award**]
4. S Bhattacharyya, I Chakrabarti, M H Kolekar, “*Complexity Assisted Consistent Quality Rate Control for High Resolution H.264 Video Conferencing*” NCVPRIPG, IIT Patna, 2015.

5. V Gulhane, M. H. Kolekar, “*Diagnosis of diseases on cotton leaves using principal component analysis classifier*”, IEEE INDICON Conference, 2014
6. M H Kolekar, S.Sengupta, “*Caption Content Analysis Based Automated Cricket Highlight Generation*,” National Communications Conf, IIT Bombay, Mumbai, 2008.
7. M. H. Kolekar, K. Palaniappan, S. Sengupta, “*Semantic Event Detection and Classification in Cricket Video Sequences*”, IEEE Indian Conf. on Vision, Graphics and Image Processing (**ICVGIP**), Bhubaneswar, India, 2008.

Book as Author

1. M H Kolekar, “*Intelligent Video Surveillance system: An Algorithmic Approach*”, CRC Press, 2018
2. M H Kolekar and Vinod Kumar, “*Biomedical Signal Processing: A Machine Learning and Deep Learning Approach*”, CRC Press, contract signed.

Books as Editor

3. P K Singh, M. H. Kolekar, S Tanwar, S T Wierzchoń, R K. Bhatnagar, “*Emerging Technologies for Computing, Communication and Smart Cities*”, Proceedings of ETCCS, Springer, 2021
4. P K Singh, Y. Singh, M. H. Kolekar, A K Kar, J K Chhabra, A Sen, “*Recent Innovations in Computing*”, Proceedings of ICRIC, Springer 2021 (ISBN 978-981-15-8296-7)
5. P K Singh, A Noor, M H. Kolekar, S Tanwar, R K Bhatnagar, S Khanna, “*Evolving Technologies for Computing, Communication and Smart World*”, Proceedings of ETCCS, Springer 2020
6. C Chakraborty, A Banerjee, M H Kolekar, L Garg, B Chakraborty “*Internet of Things for Healthcare Technologies*”, Springer, 2020
7. P K Singh, A K Kar, Y Singh, M H Kolekar, S Tanwar, “*Proceedings of ICRIC 2019*”, Springer 2019.
8. M. H. Kolekar, Vinod Kumar, “*Biomedical Signal and Image Processing in Patient Care*”, IGI Global, 2017.
9. M. H. Kolekar and U. Rajendra Acharya, “*Special Section on Biomedical Signal and Image Processing*”, Journal of Medical Imaging and Health Informatics, American Scientific Publishers, June 2012.
10. M. H. Kolekar, “*Proceedings of Int Conf on Signal, Image and Video Processing*”, Excellent Publishing House, Jan 2012.

Book Chapters

1. N. Sharma, M. H. Kolekar, "*Dementia diagnosis with EEG using machine learning*", Artificial Intelligence for Neurological Disorders, Academic Press, pp 107-129, 2023.
2. C k Jha, A Choubey, M H Kolekar, C Chakraborty, "*Automated Acute Lymphoblastic Leukemia Detection Using Blood Smear Image Analysis*", Machine Learning and Deep Learning Techniques for Medical Image Recognition, CRC Press, 2023.
3. A Ray, M H Kolekar, "*Image Segmentation and Classification Using Deep Learning*", Machine Learning Algorithms for Signal and Image Processing, Wiley, 2022
4. N Sharma, M H Kolekar, "*Dementia Diagnosis with EEG using Machine Learning*", Artificial Intelligence for Neurological Disorders, Elsevier publication, 2022.
5. C.K. Jha, M.H. Kolekar, "*Arrhythmia ECG beats classification using wavelet-based features and support vector machine classifier*", IGI Global Publisher, 2019
6. D.P. Dash, M. H. Kolekar, "*Epileptic Focus Localization: A Discrete Wavelet Transform and Hidden Markov Model based Approach*", Biomedical Signal and Image Processing in Patient Care, IGI Global Publisher, 2017
7. C K Jha, M. H. Kolekar, "*Classification and compression of ECG Signal for Holter Device*" Biomedical Signal and Image Processing in Patient Care, IGI Global Publisher, 2017
8. S. Chatterjee and M H Kolekar, "*Feature extraction and segmentation techniques in static hand gesture recognition system*", Hybrid Intelligence for Image Analysis and Understanding, John Wiley Publication, UK, 2016
9. H Rai, M. H. Kolekar, N Keshav, J K Mukherjee, "*Trajectory Based Unusual Human Movement Identification for Video Surveillance System*", Progress in Systems Engineering, Springer publication, pp. 789-794, 2015
10. A. K. Verma, S Sarangi, M. H. Kolekar, "*Misalignment Fault Prediction of Motor-Shaft using Multiscale Entropy and Support Vector Machine*", Advances in Intelligent Informatics, Springer International Publishing, pp.359-370, 2015.
11. M. H. Kolekar, G. Raja, S. Sengupta, "*An introduction to wavelet-based image processing and its applications*", Recent Advances in Computer Vision and Image Processing: Methodologies and Applications, IGI Global publishers, USA, 2013.

Patent

1. Kaustubh Gharat, Harshita Jogi, Kaustubh Gode, Dr. Kiran Talele, Dr. Sujata Kulkarni and Dr. Maheshkumar H.Kolekar, "*Automated Crop Health Monitoring System Using Unmanned Aerial Vehicle*" Indian Patent Office on 26/07/2024.

(Application No.: 202421043217, Publication Date: 26/07/2024)

J. Award /Prize/Honors:

Awards

- My name has appeared in the list of **top 2% scientists of the world in Image Processing area**, published by Stanford University, 2021, 2022, 2023 and 2024
- **Best Paper Award**- 4th International Sym on Signal Processing and Intelligent Recognition Systems, 2018
- **Best Paper Award**- Symbiosis Institute of Health Sciences 2017
- Recipient of DST **DAAD** Fellowship 2017
- **Best paper award** -Computer Society of India (2004) (During PhD)

Honors

- **Fellow**, Institution of Engineers, India
- **Fellow**, IETE
- **Senior Member** IEEE
- **Editor**, IETE Journal of Research
- **Associate Editor**, IEEE Transactions on Multimedia
- Workshop accepted at **ICIP 2025**: Generative AI for Forensics and Security applications (GenAI-FS 2025)
- Workshop accepted at **ICIP 2025**: Innovative Approaches in Image and Signal Processing for Autonomous Vehicles
- **IEEE Signal Processing society, CI-TC member** Nov 1, 2022 to Nov 8, 2024
- Savitribai Phule Pune University Vice-Chancellor Nominee **Member on Board of Study**, 2024
- Invited Member of **Board of Governance**, for Govt College of Engineering, Chandi, Bihar during 2019 to 2021.
- **Member of Research Project Evaluation Committee**, DST Bihar, Patna
- **Member of AICTE Expert Committee**, Research project evaluation, 2019
- **Chair, Signal Processing Symposium**, 29th National Conference on Communication (NCC), IIT Guwahati, 2023
- **Technical Program Chair**, 8th International Symposium on Computer Vision and the Internet (VisionNet) 2022
- **Publicity Chair**, 7th International Conference on Computer Vision & Image Processing, 2022
- **Technical Committee Member**, 26th International Conference on Pattern Recognition (ICPR 2022)
- **Technical Program Chair**, 6th International Symposium on Signal Processing and Intelligent Recognition Systems at Chennai, India, Oct 14-17, 2020.
- **Workshop Chair**, 5th International Conference on Computing, Communication and

Security (ICCCS), 2020

- **Tutorial Chair**, 4th International Conference on Computing and Network Communications (CoCoNet), 2020
- **Advisory Committee Member**, 3rd International Conference on Computing and Network Communications, Dec 18-21, 2019
- Steering Committee Member, International Conference on Machine Learning and Information Processing, Dec 27-29, 2019.
- **Workshop Chair**, 4th International Symposium on Signal Processing and Intelligent Recognition Systems, Bangalore, Sept 19-22, 2019.
- **Session Chair**, International Conference Futurist Trends in Network and Computing Technologies, at **CDAC, Mohali**, Nov 23, 2019
- **Technical Program Chair**, 4th International Symposium on Signal Processing and Intelligent Recognition Systems at Bangalore during Sept 19-22, 2018.
- **Area Chair**, International Conf on Computer Vision & Image Processing (CVIP), 2018, IIITDM Jabalpur.
- **Program Chair**, 4th International Symposium on Computer Vision and the Internet, 2017, Manipal University, India.
- **Area Chair**, International Conf on Computer Vision & Image Processing (CVIP), 2017, IIT Roorkee.
- **Session Chair**, IEEE annual International conference **TENCON 2016** at Singapore
- **Tutorial Chair**, Int Conf on Human Computer Interaction, **IIT Kharagpur**, 2012
- **Organizing Chair** of an International Conference on Signal, Image and Video Processing at IIT Patna during Jan 13-15, 2012
- **Guest Editor**, Special issue on ‘Biomedical Signal and Image Processing’ Journal of Medical Imaging and Health Informatics, American Publisher, 2012
- **Editorial Board member**, American Journal of Signal Processing, Scientific and Academic Publishing
- **Reviewer**: IEEE journals such as JBHI, IEEE TIM, IEEE conferences such as ICASSP, Elsevier Journals

K. Organization of Conferences/Workshops/Tutorials:

- Organized CEP on *Deep Learning for Digital Health: Technology and Management*, IIT Patna, Feb 7-8, 2024
- Organized ATAL FDP on *AI for Healthcare Technology and Management*, IIT Patna, Sept 5-16, 2022
- Organized CEP on *Deep Learning for Healthcare Management*, IIT Patna, Dec 2-4, 2022
- Organized workshop on *Applications of Biomedical Signal Processing Techniques in Healthcare*, IIT Patna Sept 7-9, 2018

- Organized workshop on *Human Behavior Analysis based on Video Analytics and Deep Learning*, during 15th IEEE Int. Conf on Advanced Video and Signal-based Surveillance (AVSS), 27-30 Nov 2018, Auckland, New Zealand.
- Organized Special Session on, “*Recent Advances in Intelligent Video Surveillance Systems*”, IEEE annual International conference TENCON 2016 at Singapore
- Organized Special Session on “*Intelligent Video Surveillance Systems*”, International Conference on Systems Engineering, Las Vegas, NV, USA, 2014.
- Organized International Conference on *Signal, Image and Video Processing* organised at IIT Patna from 13th to 15th January, 2012
- Organized Tutorial Sessions during International Conference on Human Computer Interaction, IIT KGP, 2012
- Organized International workshop on "Applications of Video Processing" at IIT Patna on Dec 24, 2010.

L. Invited Talks:

- Delivered keynote address on, “*Traffic Video Monitoring Under Different Lighting Conditions*”, in IEEE sponsored Int Conf on Advancement in Electronics and Communication Engineering **AECE-2023**, Ghaziabad during Nov 23-24, 2023.
- Delivered invited talk on “*Generative AI for Image Generation and Metaverse Perspective*” during 5th Int Conf on Deep Learning, Artificial Intelligence and Robotics (ICDLAIR), **NIT Kurukshetra**, Dec 8, 2023.
- Delivered invited talk on, “*Deep Learning based Human Activity Recognition*”, during High-end Workshop (KARYASHALA) on ‘Artificial Intelligence and Data Science for Industrial Applications’ **CSIR CMERI Durgapur**, Jan 20, 2023.
- Delivered invited talk on, "Deep Learning Techniques for COVID-19 detection and management", One day workshop on Recent Trends in Healthcare Technology at **AIIMS Patna**, Sept 13, 2022
- Delivered talk on, “*Role of AI in Agri-food supply chain management*”, during ATAL-sponsored FDP on ‘Agri-Food Supply Chain Management’, **NIT Uttarakhand**, Nov 4, 2022.
- Delivered invited talk on, “*Deep Learning Techniques for Automated Screening of COVID-19*”, during AICTE-ATAL FDP program on ‘Data Science and Deep Learning’, **IIT Allahabad**, July 20, 2021
- Delivered invited talk on, “*Deep Learning Techniques for Biomedical Signal Analysis*”, **NIT Hamidpur** on March 12, 2021

- Delivered keynote address on, “*Machine Learning and Deep Learning Techniques for Abnormal Human Activity Recognition*”, Inter Conf FTNCT, at **Southern Federal University, Taganrog, Russia**, on Oct 15, 2020
- Delivered invited talk on “*Recent Development in COVID 19 Detection using Image Processing Techniques*”, Short Term Course, **NIT Uttarakhand**, July 8, 2020
- Delivered invited talk on, “*Deep learning techniques for brain tumor detection*”, International Conference FTNCT, **CDAC, Mohali**, Nov 23, 2019
- Delivered keynote address during “*Human Activity Recognition and Tracking to Enhance Security*”, Int Conf on Emerging Trends in Communication, Computing and Electronics”, **University of Allahabad**, April 2018.
- Delivered keynote address in the IEEE Int. Conf on Image Information Processing (ICIIP 2017), **JUIT Solan**, Dec 2017.
- Delivered keynote speech on, “*Abnormal Human Activity Recognition for Video Surveillance*”, Int Conf ICACCI, **LNM Institute of Technology, Jaipur**, Sept 2016.
- Delivered invited talk on, “*Video Object Detection and Tracking*” Computer Science Dept, Workshop on Video Analytics under Indo–US 21st century Knowledge Initiative Programme, **NIT Tiruchirappalli**, on Nov 27, 2015.
- Delivered invited talk on, “*Image Processing Techniques for medical application*”, **IIT Dhanbad** on Dec 30, 2014.
- Delivered invited talk on, “*Image Processing Techniques on Cardiovascular Disease Diagnosis and 3D Modeling of Aorta*”, Cardiovascular Bioengineering Symposium, **IIT Delhi** on Dec 12, 2013.
- Delivered keynote address on, “*Image Processing Techniques for Cardiovascular Disease Diagnosis and pre-surgical planning*”, Int Conf on Biomedical Systems, signals, and Images, **IIT Madras**, Chennai, Nov 30, 2012.
- Delivered invited talk on, “*Real-time Abnormal Human Activity Recognition*”, **Bhabha Atomic Research Center, Mumbai**, Sept 14, 2012.

Dr. Maheshkumar H. Kolekar