

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

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

			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

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	June 2025
2	Ashish Raj	License plate detection with low light enhancement using Diffusion Model	Communication Systems Engg	June 2025
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 diabetic subject using deep	Communication Systems Engg	June 2022

		learning methodology		
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	ECG Signal Compression	Communication	July 2018

	Ashraf	Using Singular Value Decomposition	Systems Engg	
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. S. Bose, M. H. Kolkear, "MHAze-Net: A Multi-Head Residual UNet with Attention-Guided Fusion-Discriminator for Single-Image Dehazing", Multimedia Tools and Applications. 2025.
2. 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).
3. A. C. Yadav, K. Shah ,A. Purohit, M. H. Kolekar, "Computer-aided diagnosis for multi-class classification of brain tumors using CNN features via transfer-learning", Multimedia Tools and Applications. 2025 Mar 15:1-24(IF: 3.0).

2024

4. 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).
5. 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).
6. 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).
7. 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).
8. 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).
9. 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).
10. 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

11. 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).
12. 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).
13. A Ray, M H Kolekar, "*Transfer learning and its extensive appositiveness in human activity recognition: A survey*", **Elsevier Journal on Expert Systems with Applications**, 122538, 2023 (IF: 7.5).

14. 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).
15. 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).
16. 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

17. 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).
18. N Aslam, M H Kolekar, “*Unsupervised Anomalous Event Detection Using Interfused Autoencoder*”, *Multimedia Tools and Applications*, 2022, (Springer) (IF: 3.0).
19. 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).
20. 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).
21. 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).
22. 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

23. 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)

24. 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)

25. 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)

26. 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)

27. 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

28. 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)

29. 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)

30. 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

31. 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)

32. 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

33. 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

34. 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

35. 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

36. 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

37. 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)

38. 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)

39. 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

40. 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

41. 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. Vinayak Bhatia, Harsh Gosula, Maheshkumar Kolekar, Sheetal Chaudhari, Nikahat Mulla, “*SAVES: A Spatio-temporal Attention-based Approach for Video Surveillance*”, *IEEE Int Conf on Image Processing (ICIP) workshop*, 2025.
2. 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.
3. V. K. Singha, , J. Barmana, M. H. Kolekar, “*Extreme Gradient Boosting Algorithm for Automatic Cardiac Arrhythmia Classification*”, *International Conference on Machine Learning and Data Engineering*, 2025.

4. V. K. Singha, , J. Barmana, M. H. Kolekar, “Automated Machine Learning Approach for COVID-19 Diagnosis Based on Deep Efficient Features from Chest CT Images”, International Conference on Machine Learning and Data Engineering, 2025.

2024

5. 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).
6. S. Jha, S. M. Kolekar, S. Bose, M.H. Kolekar, D. Swain, D, “Smart Grid Energy Management: Leveraging Bidirectional LSTM and Attention Mechanism for Accurate Forecasting”, International Conference on Pattern Recognition (ICPR) Workshop, 2024.
7. Y. Sonawane, M. H. Kolekar, A. C. Yadav, G. Kadam, S. Tiwarekar, D. R. Kalbande, “DCRUNet++: A Depthwise Convolutional Residual UNet++ Model for Brain Tumor Segmentation”, ICPR, Dec 1, 2024 (Grade: B).
8. M. Sahu, A. Singh, M. H. Kolekar, “Supervised Domain Adaptation for Data-Efficient Visible-Infrared Person Re-identification”, ICPR Dec 1, 2024 (Grade: B).
9. 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.
10. 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

11. 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
12. 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

- 13.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.
- 14.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.
- 15.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
- 16.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

- 17.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.
- 18.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.
- 19.Rishi Kishore, Nazia Aslam, Maheshkumar H. Kolekar, “*Vehicle ReID: Learning Robust Feature using Vision Transformer and Gradient Accumulation for VehicleRe-identification*”, Int Conf on Computer Vision and Image Processing (CVIP), Springer, 2022.
- 20.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

- 21.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

22.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

23.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)**

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

25.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

26.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)**

27.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)**.

28.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

29.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.

30.C K Jha, M. H. Kolekar, “*Efficient ECG data compression and transmission algorithm for Telemedicine*”, Int Conf on COMMunication Systems and NETworkS (**COMSNETS**), 2016.

31.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.

32. 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

33. M. H. Kolekar, D P Dash, "A Nonlinear Feature Based Epileptic Seizure Detection using Least Square Support Vector Machine Classifier" IEEE TENCON, 2015.
34. 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.
35. 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

36. 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

37. 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.
38. 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

39. 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

40. M. H. Kolekar, K. Palaniappan, “*A Hierarchical Framework for Semantic Scene Classification in Soccer Sports Video*”, IEEE Int Conf. TENCON, India, 2008.
41. 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

42. M. H. Kolekar, S. Sengupta, “*A Hierarchical Framework for Generic Sports Video Classification*”, Asian Conf on Computer Vision (ACCV), Hyderabad, India, 2006.
43. M. H. Kolekar, S. Sengupta, “*Event-importance based customized and automatic cricket highlight generation*”, IEEE Int. Conf. on Multimedia and Expo (ICME), 2006.
- 2005
44. 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 Adel Hafiane, “Generative AI for Video Surveillance Applications”, IET International Book Series on Multimedia Information Processing and Security, 2025 (in progress)

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. M. Rai, R. K. Yadav, N. Goel, M. H. Kolekar, “*Harnessing the Power of IoT-enabled Machine Learning in Healthcare Applications*”, Medical Procedures, Testing and Technology, 2025.
2. A. C. Yadav, M. H. Kolekar, D. B. Pati, M. K. Zope, “*Image informatics for clinical and preclinical biomedical analysis*”, Mining biomedical text, images and visual features for information retrieval, 2025.
3. D P Dash, M H Kolekar, E Mishra, “*A Comparative Study of Different Machine Learning Techniques for Skin Disease Detection*”, Machine Learning for Disease Detection, Prediction, and Diagnosis. Springer, Singapore, 2025.

4. N. Sharma, M. H. Kolekar, "*Dementia diagnosis with EEG using machine learning*", Artificial Intelligence for Neurological Disorders, Academic Press, pp 107-129, 2023.
5. 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.
6. A Ray, M H Kolekar, "*Image Segmentation and Classification Using Deep Learning*", Machine Learning Algorithms for Signal and Image Processing, Wiley, 2022
7. N Sharma, M H Kolekar, "*Dementia Diagnosis with EEG using Machine Learning*", Artificial Intelligence for Neurological Disorders, Elsevier publication, 2022.
8. C.K. Jha, M.H. Kolekar, "*Arrhythmia ECG beats classification using wavelet-based features and support vector machine classifier*", IGI Global Publisher, 2019
9. 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
10. 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
11. 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
12. 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
13. 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.
14. 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. K Gharat, H Jogi, K Gode, K Talele, S Kulkarni and M 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)

2. S. Hallur, S. Jain, M. H. Kolekar, S. Kulkarni, K. Talele, “A bank safe deposit box security system with biometric authentication and sensor monitoring”, Federal Republic of Germany, (IPC: G07C 9/37). (Granted)

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, 2024 and 2025
- IETE Dr. K. D. Pavate Memorial Award 2025 for my contributions to generative AI in the healthcare and video surveillance sectors.
- **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