

Dr. Mitul Kumar Ahirwal**Associate Professor** (Computer Science and Engineering)

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Brief Intro:

Dr. Mitul Kumar Ahirwal is currently working as Associate Professor in the Department of Computer Science and Engineering, Maulana Azad National Institute of Technology, Bhopal. He also worked with NIT Raipur and NIT Delhi. He has completed his Ph.D. from IIITDM Jabalpur in 2014. He has more than 10 years of experience in teaching and research. His area of specialization includes Brain-Computer Interface, Artificial Intelligence, Soft Computing, Evolutionary Intelligence, Biomedical Signal & Image Processing. He has published more than 80 research papers in SCOPUS/SCI indexed journals/ International Conferences. He has published 03 books, Computational Intelligence and Biomedical Signal, Processing (Springer), Artificial Intelligence Applications for Healthcare (Taylor & Francis) and Basics of UNIX Environment and System Calls (Edupublication). He has completed 03 research projects, funded by Science and Engineering Research Board (SERB), Cognitive Science Research Initiative (CSRI), and SEED Grant by MANIT Bhopal on the topics related to Brain-Computer Interface. He also developed state-of-the art Brain-Computer Interface Lab at MANIT Bhopal. He has organized more than 10 STTPs/ workshops, 02 International Conference and chaired sessions in many International Conferences. He is a senior member of IEEE, International Association of Engineers (IAENG), Indian Academy of Neuroscience (IAN), and Soft computing Research society (SCRS) professional bodies. He has also been awarded Early Career Research Award /Grant (ECRA) by SERB in 2017. Also selected as Young Scientist in domain of Artificial Intelligence in 2nd SCO-YSC (Shanghai Cooperation Organization - Young Scientist Conclave) 2022 organized by DST, held on 06 - 10 Feb 2023 at JNCASR Bangalore, India. He is also an active reviewer of many Elsevier, IEEE and Springer journals/conferences. In 2025, selected as Young Science & Technology Leader to participate in Emerging Science, Technology and Innovation Conclave (ESTIC-2025), organized by DST, New Delhi in Nov-2025. He is also an active reviewer of many Elsevier, IEEE and Springer journals/conferences.

He is also served various administrative posts like departmental Exam-Coordinator, departmental undergraduate program committee (DUPC) coordinator, and Assistant Proctor. He teaches subjects like Operating Systems, Data Communication, Brain Computer Interface to UG and PG students.

Qualification:

Degree	Institution conferring	Field (s)	Year
B.E	SATI Vidisha- Govt. Engg. College (M.P.), India	Computer Science and Engineering	2009
M.Tech	NIT Raipur (C.G.), India	Computer Technology	2011
Ph.D.	PDPM-IIITDM Jabalpur (M.P.), India	Computer Science and Engineering	2014

Professional Experience:

S.No	Post	Institute	Duration
1	Assistant Professor	National Institute of Technology, Delhi, India	05 Aug 2014 to 01 June 2015
2	Assistant Professor (Grade-II)	National Institute of Technology, Raipur, India	04 June 2015 to 04 Feb 2019
3	Assistant Professor (Grade-I)	Maulana Azad National Institute of Technology, Bhopal, India	05 Feb 2019 to 23 Dec 2024
4.	Associate Professor	Maulana Azad National Institute of Technology, Bhopal, India	24 Dec 2024 to Till date

Professional Membership:

- IEEE Senior Member
- Indian Academy of Neurosciences (IAN), Life Member
- Soft Computing Research Society (SCRS) of India, Life Member
- International Association of Engineers (IAENG), Life Member
- IAENG Society of Artificial Intelligence, Life Member
- IAENG Society of Computer Science, Life Member
- Fellow (FSIESRP) The Society of Innovative Educationalist & Scientific Research Professional- Chennai (Accredited with - Innovative Scientific Research Professional Malaysia Kuala Lumpur, Malaysia)

Awards/ Achievements :

- **Selected as Young Science & Technology Leader to participate in Emerging Science, Technology and Innovation Conclave (ESTIC-2025), organized by DST, New Delhi in Nov-2025**
- **Selected to participate in 2nd SCO-YSC as Young Scientist (Shanghai Cooperation Organisation - Young Scientist Conclave) 2022, 06 - 10 Feb 2023 at JNCASR Bangalore, India (<https://scoysc.jncasr.ac.in/>, <http://eng.sectsco.org/>, <https://dst.gov.in/growth-sco-depends-collaboration-among-youth-science-technology-innovation-sector-dr-singh>)**
- **Gold Medal:** Secured by my M.Tech. Scholar Mr. Chandan Singh at MANIT Bhopal, Convocation held in Nov, 2025.
- **Best Track Paper Award** in 4th International Conference on Machine Intelligence and Signal Processing (MISP 2022) at NIT Raipur, India
- **First Prize** (of Track-1: Engineering) Secured by my PhD Scholar Mr.Narendra Kumar Rout in **Research Conclave** at NIT Mizoram, 22-23 March, 2021.
- **Second Prize** (of Track-1: Engineering) Secured by my PhD Scholar Mrs.Nimisha Gupta in **Research Conclave** at NIT Mizoram, 22-23 March, 2021.
- **Innovative Technological Researcher Award** (2020), by The society of Innovative Educationalist & Scientific Research Professional Chennai, India.
- **Early Career Research Award** (2017), Research Grant by SERB New Delhi, India.

Books Published:

1. **Artificial Intelligence Applications for Health Care, (2022), CRC press, Taylor & Francis Group, New York, London.**
2. **Computational Intelligence and Biomedical Signal Processing: An Interdisciplinary, Easy and Practical Approach, (2021), Springer International Publishing, USA.**
3. **Basics of UNIX Environment and System Calls, (2019), EDUCREATION, New Delhi, India.**
4. **Basics of UNIX Environment and System Calls – Hindi Version, (2021), EDUCREATION, New Delhi, India.**

Patents:

1. **Indian Provisional Patent filed, Title: A System and Method for Cognitive Load Analysis for Advancement of Cyber Physical Systems (Ref. No.: 202021038424) (05/09/2020)**

2. **Germen Patent Granted**, Title: An improved content-based image retrieval system based on continuous learning quantitative analytical hierarchical process (Ref. No.: 202022101030.7) (14/04/2022)
3. **Indian Design Patent Filed**: Portable Mental State Observation Device (Ref: 429889-001) (10/09/2024)
4. **Indian Design Patent Filed**: Smart Back Support Belt (Ref. No.: 461694-001) (10-06-2025)

R&D Projects:

Project Title	Role	Duration	Funding Agency	Total Cost	Status
Development of an Efficient Devanagari Script input based P300 Speller System for Brain-Computer Interface	Co-PI	3 Years (2016-2019)	CSRI, DST, India	27 lakhs	Completed
Development of Computational Model for Decision Making based on Emotion Recognition through EEG signal	PI	2 Years (2017-2019)	SERB, DST, India	11.5 lakhs	Completed
Cognitive Load Analysis during Mental Work	PI	2 Years (2019-2021)	SEED Grant, MANIT Bhopal, India	3.7 lakhs	Completed

Consultancy Projects:

Project Title	Role	Duration	Funding Agency	Total Cost	Status
Farm Digitization, Crop Classification and Yield Prediction using Artificial Intelligence / Machine Learning	Co-PI	06 Months	P2L IMPACT Learning Empowers Pvt. Ltd. C-34, Ground Floor, Mahendru Enclave, New Delhi-110033	1,18,000/-	Completed

State-of-the-art Lab: Brain Computer Interface Lab at MANIT Bhopal

Brain-computer interface (BCI) is a non-muscular communication and control system that does not depend on the normal pathways of peripheral nerves and muscles. As a valuable augmentative communication system, BCI has recently gained considerable research interest, especially in research involving disabled persons, and many useful applications have been discovered. This lab is devoted to the research and development of Brain-Computer Interface (BCI) to raise awareness of mental health and other emerging field of BCI technology.

Google Scholar: Citations: 1068, H-index: 17

Please visit: Google Scholar Link: <https://scholar.google.co.in/citations?user=fWgOgcIAAAAJ&hl=en>

List of Published Paper: (Total Journals: 50, As First Author: 17, Corresponding Author: 16, Co-author: 17)

International Journals: (SCI/ Scopus Indexed)

(SCI /SCIE= 30, Scopus = 17, Referred = 02)

[32 are in Q1/Q2]

1. Sushil Chaturvedi, **Mitul Kumar Ahirwal**, Investigation of Various Validation and Testing Schemes for Classification of Cross-Session Mental Workload to Match Real-Life Expectations of BCI: A Transfer Learning and XAI Approach, **Biomedical Signal Processing and Control**, 2026.
2. Khushboo Singh, **Mitul Kumar Ahirwal**, Manish Pandey, Selected Channel based Multiclass Emotion Classification from Wearable Human Brain EEG Signal, **Measurement: Sensors**, 101874, March 2025.
3. Vipul Sharma and **Mitul Kumar Ahirwal**, An End-to-End Brain Computer Interface System for Mental Workload Estimation through Hybrid Deep Learning Model, **Human-Centric Intelligent Systems**, Oct 2024.
4. Lalit Kumar, Manish Pandey, **Mitul Kumar Ahirwal**, "A Survey on Parallel Nature Inspired Algorithms", **Wireless Personal Communications**, Sep 2024.
5. Rout, N.K., **Mitul Kumar Ahirwal**, Atulkar, M., "An Optimized Pair-Wise Comparison Approach for Automated Feature Weight Assignment in Content-Based Image Retrieval System", **Multimedia Tools and Applications** (Aug 2024).
6. Lalit Kumar, Manish Pandey, **Mitul Kumar Ahirwal**, Implementation and testing of parallel PSO to attain speedup on general purpose computer systems, **Multimedia Tools and Applications** (June 2024).

7. Mangesh Ramaji Kose, **Mitul Kumar Ahirwal**, Mithilesh Atulkar, A Divide and Conquer approach for In-Depth Analysis of Brain Connectivity Network using Ordinal Sequence based Characterizer, **Multimedia Tools and Applications** (May 2024).
8. Manju Lata Sahu, Mithilesh Atulkar, **Mitul Kumar Ahirwal**, Afsar Ahamad, Internet-of-Things based Machine Learning enabled Medical Decision Support System for Prediction of Health Issues, *Health and Technology* (Oct 2023)
9. Khushboo Singh, **Mitul Kumar Ahirwal**, Manish Pandey, Mental Health Monitoring Using Deep Learning Technique for Early Stage Depression Detection, *SN Computer Science* (July 2023)
10. Khushboo Singh, Mitul Kumar Ahirwal, Manish Pandey, Subject wise data augmentation based on balancing factor for quaternary emotion recognition through hybrid deep learning model, *Biomedical Signal Processing and Control* (May 2023)
11. Mangesh Ramaji Kose, **Mitul Kumar Ahirwal**, Mithilesh Atulkar, Weighted Ordinal Connection based Functional Network Classification for Schizophrenia Disease Detection using EEG signal, **Physical and Engineering Sciences in Medicine** (May 2023).
12. Mangesh Ramaji Kose, **Mitul Kumar Ahirwal**, Mithilesh Atulkar, EEG based variable node functional network comparison for multiclass brain disease detection using stacked ensemble model, **Int. J. of Biomedical Engineering and Technology** (May 2023).
13. Lalit Kumar, Manish Pandey, **Mitul Kumar Ahirwal**, Parallel Global Best-Worst Particle Swarm Optimization Algorithm for Solving Optimization Problems, **Applied Soft Computing Journal** (April 2023), In Press
14. **Mitul Kumar Ahirwal**, Prabhat Kumar, Educational institutions selection using Analytic Hierarchy Process based on National Institutional Ranking Framework (NIRF) criteria, **Interchange** (April 2023), In press
15. Mangesh Ramaji Kose, **Mitul Kumar Ahirwal**, Mithilesh Atulkar, Dynamic characterization of functional brain connectivity network for mental workload condition using an effective network identifier, **International Journal of Information Technology** (Jan 2023), <https://doi.org/10.1007/s41870-022-01151-0>
16. Khushboo Singh, Mitul Kumar Ahirwal, Manish Pandey, Quaternary Classification of Emotions based on Electroencephalogram Signals Using Hybrid Deep Learning Model, **Journal of Ambient Intelligence and Humanized Computing** (Nov 2022), In press.
17. Rout, N.K., **Mitul Kumar Ahirwal**, Atulkar, M., Improved Content-Based Medical Image Retrieval System for Effective Skin Melanoma Diagnosis based on Proposed Optimized Pair-Wise Comparison (OPWC) Approach, **Journal of Digital Imaging** (Accepted in Sep 2022) <https://doi.org/10.1007/s10278-022-00710-y>
18. Nimisha Gupta, **Mitul Kumar Ahirwal**, Mithilesh Atulkar, Simulation and modeling of human decision-making process through reinforcement learning based computational model involving past experiences, **Decision Science Letters**, (Accepted in Aug 2022) vol. 11(4), pp. 366-378
19. Nimisha Gupta, **Mitul Kumar Ahirwal**, Mithilesh Atulkar, Development of Human Decision Making Model with Consideration of Human Factors through Reinforcement Learning and Prospect Utility Theory, **Journal of Experimental & Theoretical Artificial Intelligence** (Accepted in Aug 2022) <https://doi.org/10.1080/0952813X.2022.2117422>.
20. Manju Lata Sahu, Mithilesh Atulkar, **Mitul Kumar Ahirwal**, Afsar Ahamad, Internet-of-Things-Enabled Early Warning Score System for Patient Monitoring, **IETE Journal of Research** (Accepted in July 2022) <https://doi.org/10.1080/03772063.2022.2110528>.
21. Rout, N.K., Atulkar, M., **Mitul Kumar Ahirwal**, Assimilation of Pair-Wise Comparison Method to Decide Weights of Features Based on the content of Image. **International Journal of Information Technology & Decision Making** (Accepted in July 2022) <https://doi.org/10.1142/S0219622022500407>.
22. Saroj Kumar Pandey, Rekh Ram Janghel, Pankaj Kumar Mishra, **Mitul Kumar Ahirwal**, Automated Epilepsy Seizure Detection from EEG Signal based on Hybrid CNN and LSTM model. **Signal Image and Video Processing** (Accepted in July 2022) <https://doi.org/10.1007/s11760-022-02318-9>.
23. Hardev Singh Pal, A.Kumar, Amit Vishwakarma, **Mitul Kumar Ahirwal**, Electrocardiogram signal compression using tunable-Q wavelet transform and meta-heuristic optimization techniques, **Biomedical Signal Processing and Control** (Accepted in June 2022), Volume 78, September 2022, 103932.
24. Saurabh Pawar, **Mitul Kumar Ahirwal**, A new fission fusion behavior-based Rao algorithm (FFBBRA) for solving optimization problems. **Evolutionary Intelligence** (May 2022)
25. Manju Lata Sahu, Mithilesh Atulkar, **Mitul Kumar Ahirwal**, Afsar Ahamad, Cloud-Based Remote Patient Monitoring System with Abnormality Detection and Alert Notification. **Mobile Networks and Applications** (2021).
26. Kose, M.R., **Mitul Kumar Ahirwal**, Kumar, A. A new approach for emotions recognition through EOG and EMG signals. **Signal Image and Video processing** (2021). <https://doi.org/10.1007/s11760-021-01942-1>
27. Rout, N.K., **Mitul Kumar Ahirwal**, & Atulkar, M. Analytic hierarchy process-based automatic feature weight assignment method for content-based satellite image retrieval system. **Soft Computing** (2021). <https://doi.org/10.1007/s00500-021-05937-5>
28. Sahu, M.L., Atulkar, M., **Mitul Kumar Ahirwal**, et al. Vital Sign Monitoring System for Healthcare Through IoT Based Personal Service Application. **Wireless Personal Communications** (2021). <https://doi.org/10.1007/s11277-021-08892-4>
29. Manju Lata Sahu, Mithilesh Atulkar, **Mitul Kumar Ahirwal** & Afsar Ahamad (2021) IoT-enabled cloud-based real-time remote ECG monitoring system, **Journal of Medical Engineering & Technology**, 45:6, 473-485, DOI: [10.1080/03091902.2021.1921870](https://doi.org/10.1080/03091902.2021.1921870)
30. Sahu, Manju Lata, Mithilesh Atulkar, and **Mitul Kumar Ahirwal**. "IoT-Based Smart Healthcare System: A Review on Constituent Technologies." **Journal of Circuits, Systems and Computers** (2021): 2130008.

31. Nimisha Gupta, **Mitul Kumar Ahirwal**, Mithilesh Atulkar, Human Decision Making Modelling for Gambling Task under Uncertainty and Risk, **International Journal of Information and Decision Sciences** (2020) [In press]
32. **Mitul Kumar Ahirwal** and M.R. Kose. "Audio-visual stimulation based emotion classification by correlated EEG channels", **Health and Technology** (Springer), Vol. 10 (1), 2020, pp.7-23.
33. **Mitul Kumar Ahirwal**, Anil Kumar, and Girish Kumar Singh. "A concept of sub-bands event related potentials to increase classes of brain computer interface system", **International Journal of Bioinformatics Research and Applications**, Vol. 16 (3), 2020, pp. 257-268.
34. Kose, Mangesh Ramaji, **Mitul Kumar Ahirwal**, and Rekh Ram Janghel. "Descendant adaptive filter to remove different noises from ECG signals." **International Journal of Biomedical Engineering and Technology**, 33, no. 3 (2020): 258-273.
35. Mangesh Ramaji Kose, **Mitul Kumar Ahirwal** and R. R. Janghel, "Principal and independent component-based analysis to enhance adaptive noise canceller for electrocardiogram signals", **International Journal of Biomedical Engineering and Technology**, (In Press), 2020.
36. **Mitul Kumar Ahirwal**, A. Kumar, G. K. Singh and N.D. Londhe, "Performance Prediction of Adaptive filters for EEG signal", **IET Science, Measurement & Technology**, Vol. 11 (5), 27 July 2017, pp. 525-531.
37. S. Jain, **Mitul Kumar Ahirwal**, A. Kumar, V. Bajaj and G.K. Singh, "QRS detection using adaptive filters: A comparative study", **ISA Transactions** (Elsevier), Vol. 66, 10 Oct 2016, pp. 362-375. [ISSN: 0019-0578, IF: 4.30]
38. **Mitul Kumar Ahirwal**, A. Kumar, and G. K. Singh, "Study of ABC and PSO algorithms as optimized adaptive noise canceller for EEG/ERP", **International Journal of Bio-Inspired Computation**, Vol. 8, No. 3, 2016, pp. 170-183. [ISSN: 1758-0374, IF: 1.91]
39. **Mitul Kumar Ahirwal**, Anil Kumar, Girish K. Singh, and Jasjit S. Suri. "Sub-band classification of decomposed single event-related potential co-variants for multi-class brain-computer interface: a qualitative and quantitative approach." **IET Science, Measurement & Technology**, 10, no. 4 (2016): 355-363. [ISSN: 1751-8822, IF: 1.97]
40. **Mitul Kumar Ahirwal**, A. Kumar, G. K. Singh, N.D. Londhe and J.S. Suri, "Scaled Correlation Analysis of EEG: A New Measure of Signal Influence", **IET Science, Measurement & Technology**, Vol. 10 (6) 29 Aug 2016, pp. 585-596. [ISSN: 1751-8822, IF: 1.97]
41. **Mitul Kumar Ahirwal**, Anil Kumar, and Girish Kumar Singh. "Sub-band adaptive filtering method for electroencephalography/event related potential signal using nature inspired optimisation techniques." **IET Science, Measurement & Technology**, 9, no. 8 (2015): 987-997. [ISSN: 1751-8822, IF: 1.97]
42. **Mitul Kumar Ahirwal**, A. Kumar, and G. K. Singh, "Improved Range Selection method for Evolutionary Algorithm based Adaptive Filtering of EEG/ ERP signals", **Neurocomputing**, (Elsevier), Vol. 144, 2014, pp. 282-294. [ISSN: 0925-2312, IF: 4.43]
43. **Mitul Kumar Ahirwal**, A. Kumar, and G. K. Singh, "Adaptive filtering of EEG/ERP through Bounded Range Artificial Bee Colony (BR-ABC) algorithm", **Digital Signal Processing**, (Elsevier), Vol. 25, 2014, pp. 164-172. [ISSN: 1051-2004, IF: 2.87]
44. **Mitul Kumar Ahirwal**, A. Kumar, and G. K. Singh, "EEG/ERP Adaptive Noise Canceller Design with Controlled Search Space (CSS) Approach in Cuckoo and other Optimization Algorithms", **IEEE/ACM Transaction on Computational Biology and Bioinformatics**, Vol. 10, No. 6, 2013, pp. 1491- 1504. [ISSN: 1545-5963, IF: 3.01]
45. **Mitul Kumar Ahirwal**, A. Kumar, and G. K. Singh, "Adaptive Filtering of EEG/ERP through Noise Cancellers using an Improved PSO Algorithm", **Swarm and Evolutionary Computation**, (Elsevier), Vol. 14, 2014, pp. 76-91. [ISSN: 2210-6502, IF: 6.91]
46. **Mitul Kumar Ahirwal**, A. Kumar, and G. K. Singh, "A New Approach for Utilization of Single ERP to Control Multiple Commands in BCI", **International Journal of Electronics Letters**, (Taylor & Francis), Vol. 2, No. 2, 2014, pp. 166-171. [ISSN: 2168-1732]
47. **Mitul Kumar Ahirwal**, A. Kumar, and G. K. Singh, "Descendent Adaptive Noise Cancellers to improve SNR of contaminated EEG with Gradient based and Evolutionary approach", **International Journal of Biomedical Engineering and Technology**, Vol.13, No.1, 2013, pp. 49-68. [ISSN: 1752-6426]
48. **Mitul Kumar Ahirwal**, A. Kumar, and G. K. Singh, "Analysis and testing of PSO variants through application in EEG/ERP adaptive filtering approach", **Biomedical Engineering Letters**, (Springer), Vol. 2, No. 3, 2012, pp. 186-197. [ISSN: 2093-985X]
49. **Mitul Kumar Ahirwal** and N.D. Londhe, "Classification of 2D Hand Movement with Power Spectrum Estimation", **International Journal of Biomedical Engineering and Technology**, Vol. 9, No. 3, pp. 277-286, 2012. [ISSN: 1752-6426]
50. **Mitul Kumar Ahirwal** and N.D. Londhe, "Power Spectrum Analysis of EEG Signals for Estimating Visual Attention", **International Journal of Computer Applications**, Vol.42, No.15, pp. 22-25, 2012. [ISSN: 0975 - 8887]

International Conference: (Total: 30, As First Author: 08)

1. Sushil Chaturvedi, **Mitul Kumar Ahirwal**, BCI-Based Cross-Dataset Mental Workload Assessment: Integrating Transfer Learning with XAI for EEG-Based Analysis, 17th IEEE International Conference on Computational Intelligence and Communication Networks 2025, NIT Goa, India, 20-21 Dec 2025.
2. Chandan Kumar Sah, **Mitul Kumar Ahirwal**, Deepak Singh Tomar, Deep Learning and EEG Signal Based Biometric System: An Application of Brain Computer Interface, IEEE International Students' Conference on Electrical, Electronics and Computer Science (SCEECS), MANIT Bhopal, India, 18-19 January 2025.
3. Mohit Baghel, Sushil Chaturvedi, and **Mitul Kumar Ahirwal**, Feature Extraction and Comparison of EEG-Based Brain Connectivity Networks Corresponding to Three Mental States (Focused, Unfocused, Drowsed) Using Graph

- Metrics, 4th International Conference on Machine Vision & Augmented Intelligence (MAI-2024), MANIT Bhopal, India, 20-22 Dec 2024.
4. Ashu Aman, Kuldeep Kumar Gautam, Mahendra Pratap Singh Kushwah, **Mitul Kumar Ahirwal**, Study of Effects on Accuracy and Size of Model Created Using TinyML, 4th International Conference on Machine Vision & Augmented Intelligence (MAI-2024), MANIT Bhopal, India, 20-22 Dec 2024.
 5. Dinesh Bansal, Mithilesh Atulkar, **Mitul Kumar Ahirwal**, Enhancing Financial Decision-Making through Cumulative Prospect Theory: Integration of Automation and Human Intelligence, International Conference on Innovations in Data Science 2024 (ICIDS - 2024), Manipal University Jaipur, 28-29 Nov, 2024.
 6. Rishabh Kholiya, **Mitul Kumar Ahirwal**, An End-to-End Brain Computer Interface for Mental Workload Classification based on EEGNet model and Data Augmentation, 2nd International Conference on Artificial Intelligence, Computing Technologies, Internet of Things (IoT) and Data Analytics, NIT Raipur, 15-17 November 2024.
 7. Dinesh Bansal, Mithilesh Atulkar, **Mitul Kumar Ahirwal**, Enhanced Human Decision-Making Model for Iowa Gambling Task, 3rd International Conference on the Paradigm Shifts in Communication, Embedded Systems, Machine Learning and Signal Processing 2024, VNIT Nagpur, 11-12 Nov 2024.
 8. Sushil Chaturvedi, **Mitul Kumar Ahirwal**, Classification of Mental Workload (MWL) Using 1D-CNN with Transfer Learning, International Conference on Pioneering Developments in Computer Science & Digital Technologies, NIT Delhi, 2nd - 4th Aug 2024
 9. Lalit Kumar, Manish Pandey, **Mitul Kumar Ahirwal**, Robustness Analysis of RS-GBWPSO Algorithm over Noisy Objective Functions, International Conference on Pioneering Developments in Computer Science & Digital Technologies, NIT Delhi, 2nd - 4th Aug 2024 (*This paper won the Best Paper Award*)
 10. Alekh Shrivastava, **Mitul Kumar Ahirwal**, Refining of Learning in Human Decision Making Models: A Simple Step towards Machine Unlearning, International Conference on Integrated Circuits, Communication, and Computing Systems (ICIC3S-2024) at Indian Institute of Information Technology Una, Himachal Pradesh, (8-9 June 2024)
 11. Shubham Pandey, **Mitul Kumar Ahirwal**, Optimization of Energy Efficiency in 5G Network through RAO-I Algorithm, 4th International Conference on Emerging Trends and Technologies on Intelligent Systems (ETTIS-2024), at CDAC Noida, UP, on 27th – 28th March, 2024
 12. Mrinal Kanti, **Mitul Kumar Ahirwal**, An Online Learning and Problem Solving (OLPS) EEG Database for Mental Workload Assessment and its Initial Benchmark Classification Performance, International Conference on Computational Intelligence (ICCI 2023) at Sardar Vallabhbhai National Institute of Technology, Surat, (Nov 2023)
 13. Utpal Singh and **Mitul Kumar Ahirwal**, Improved Classification of Mental Workload Using One Dimensional Convolutional Neural Network and SMOTE Technique, 7th International Conference on Graphics and Signal Processing at Fujisawa, Japan, June-2023. <https://dl.acm.org/doi/10.1145/3606283.3606291>
 14. Lalit Kumar, Manish Pandey, **Mitul Kumar Ahirwal**, Sparse based Particle Swarm Optimization, 2nd International Conference on Data Science and Intelligent Applications (ICDSIA-2023) at Gandhinagar Institute of Technology, Gandhinagar, Gujarat, (April 2023).
 15. **Mitul Kumar Ahirwal**, Sauhard Pareek, Samyak Mehta, Improved Concentrated Mental State Classification through EEG Signal Augmentation and One-Dimensional Convolutional Neural Network, International Conference on Sustainable Technology and Advanced Computing in Electrical Engineering at SVNIT Surat, Gujarat, (19-20 Jan 2023)
 16. Saurabh Mahadev Pawar, **Mitul Kumar Ahirwal**, Fission Fusion Behavior-Based Rao Algorithm (FFBBRA): Applications over Constrained Design problems in Engineering, 4th International Conference on Machine Intelligence and Signal Processing (MISP 2022) at NIT Raipur. (*This paper won the Best Paper Award*)
 17. Mangesh Kose, **Mitul Kumar Ahirwal**, Mithilesh Atulkar, Comparative Analysis of Node Dependent and Independent Graph Metrics for Brain Connectivity Network, 4th International Conference on Machine Intelligence and Signal Processing (MISP 2022) at NIT Raipur.
 18. Yedugani Shailender, **Mitul Kumar Ahirwal**, Analysis and Testing of Different Penalty Function Methods and Genetic Algorithm for Solving Beam-Slab Layout Design Problem, 2nd International Conference on Recent Advances in Computational Techniques (IC-RACT 2022) at Amity University Mumbai.
 19. Nimisha Gupta, **Mitul Kumar Ahirwal**, Mithilesh Atulkar, Modeling of Human Decision-Making Process and Effect of Human Factors – A Review, 2nd International Conference on Recent Advances in Computational Techniques (IC-RACT 2022) at Amity University Mumbai.
 20. Aman Anand Rai, **Mitul Kumar Ahirwal**, "Cognitive Load Classification during Arithmetic Task using Single Convolution Layer based 2D-CNN", 3rd International Conference on Machine Learning, Image Processing, Network Security and Data Sciences (MIND-2021) at NIT Raipur.
 21. Utpal Singh and **Mitul Kumar Ahirwal**, Mental Workload Classification for Multitasking Test using Electroencephalogram Signal, IEEE International Conference on Technology, Research, and Innovation for Betterment of Society (TRIBES – 2021) at IIIT Naya Raipur.
 22. Rout, N.K. and **Mitul Kumar Ahirwal**, M. Atulkar, Identification of Similar Gastrointestinal Images Through Content Based Image Retrieval System Based on Analytical Hierarchical Process, 2nd IEEE International Conference on Range Technology (ICORT Aug 2021) at DRDO Chandipur, Odisha, India.
 23. **Mitul Kumar Ahirwal**, Gautam Patidar, Neeraj, Sandeep Kumar, Amit, Regression-Based Model of Low Cost Air Quality Monitoring System, International e-Conference on Intelligent Systems and Signal Processing, College of Engineering & Technology, Gujarat, India, (28-30 Dec 2020) Processing in Springer.

24. **Mitul Kumar Ahirwal**, "Analysis and Identification of EEG Features for Mental Stress", Evolution in Computational Intelligence, Frontiers in Intelligent Computing: Theory and Applications (FICTA, Jan 2020 at NITK Surathkal).
25. **Mitul Kumar Ahirwal** and M. R. Kose, Development of Emotional Decision-Making Model Using EEG Signals, Evolution in Computational Intelligence, Frontiers in Intelligent Computing: Theory and Applications (FICTA, Jan 2020 at NITK Surathkal).
26. AmanAnandRai, **Mitul Kumar Ahirwal**, "EEG based Cognitive Load Classification during Mental Arithmetic Task", 26th International Conference on Advanced Computing and Communications (16-18 Dec 2020), National Institute of Technology Silchar (In Press).
27. **Mitul Kumar Ahirwal** and MangeshRamajiKose, "Emotion Recognition System based on EEG signal: A Comparative Study of Different Features and Classifiers", International Conference on Computing Methodologies and Communication (ICCMC 2018), Erode, India, 15-16 Feb 2018.
28. M. I. Sahu, M. Atulkar and **Mitul Kumar Ahirwal**, "Comprehensive Investigation on IoT based Smart HealthCare System," 2020 First International Conference on Power, Control and Computing Technologies (ICPC2T), Raipur, India, 2020, pp. 325-330, doi: 10.1109/ICPC2T48082.2020.9071442.
29. Gupta, Nimisha, **Mitul Kumar Ahirwal**, and MithileshAtulkar. "Computational model for human decision making: A study of prospect theory." In 2018 Conference on Information and Communication Technology (CICT), pp. 1-6. IEEE, 2018.
30. Rout, N.K. and **Mitul Kumar Ahirwal**, 2018, July. A Content Based Image Retrieval System: Analysis of Individual and Mixed Image Features. In 2018 International Conference on Recent Innovations in Electrical, Electronics & Communication Engineering (ICRIEECE) (pp. 2561-2566). IEEE.
31. **Mitul Kumar Ahirwal**, Kumar, A. and Singh, G.K., 2017, June. An Approach to Design Self Assisted CBIR System. In Proceedings of the International Conference on Graphics and Signal Processing (pp. 21-25).
32. Londhe, N.D., **Mitul Kumar Ahirwal** and Lodha, P., 2016, April. Machine learning paradigms for speech recognition of an Indian dialect. In 2016 international conference on communication and signal processing (ICCSP) (pp. 0780-0786). IEEE.
33. **Mitul Kumar Ahirwal**, A. Kumar, N.D. Londhe and H. Bikrol, "Scalp Connectivity Networks for Analysis of EEG Signal during Emotional Stimulation", 5th IEEE International Conference on Communication and Signal Processing (ICCSP), APEC, Melmaruvathur, India, pp. 462-466, 6-8 April, 2016.
34. **Mitul Kumar Ahirwal** and N. D. Londhe, "Offline Study of Brain Computer Interfacing for Hand Movement Using OpenVIBE," International Conference on Process Automation, Control and Computing, 2011, pp. 1-5, 20-22 July 2011.

International Conference Organized:

- 4th International Conference on Machine Learning, Image Processing, Network Security and Data Sciences MIND-2022 (Virtual mode) January 19th - 20th, 2023.
 - Conference Webpage: <https://conf.manit.ac.in/mind2022/>
 - Conference Proceedings (CCIS volume 1762 & 1663, RRCS Journal):
 - <https://link.springer.com/book/10.1007/978-3-031-24352-3>
 - <https://link.springer.com/book/10.1007/978-3-031-24367-7>
 - <https://ojs.wiserpub.com/index.php/RRCS/issue/view/rrcs.v2i32023>
- 4th International Conference on Machine vision and Augmented Intelligence conference, MAI-2024 (Hybrid Mode) December 20-22, 2024 <https://mvai.in/2024/>

PG/ Ph.D Guided:

- **Ph.D.:** 06 Completed, 06 Ongoing
- **M. Tech.:** 18 Completed, 04 ongoing

Administrative Work:

At MANIT Bhopal (from 2019 to till date)

- Departmental Under Graduate Programme Committee (DUPC) Coordinator (Jan 2024 – at present)
- Departmental Exam Co-coordinator (2020-2023)
- Faculty Coordinator T&P Cell (2019-2021)
- Assistant Proctor (2019-2021)
- Networking Co-coordinator (2020-2023)
- Core Committee Member of MANIT Tinkering Lab (2021)
- Discipline Committee Member in Maffick 2020
- Member of Networking and Degree Certificate Designing Committee in 17th convocation, 2020
- Member in Organizing Committee of Research Scholar Day 2021
- National Academic Depository (NAD) Coordinator (2022-at present)

At NIT Raipur (from 2015 to 2019)

- Faculty-Member in Semester Admission committee of MCA III and VI sem at NIT Raipur
- Member of Anti-Ragging Committee at NIT Raipur
- Member of Web Content Monitoring Committee at NIT Raipur
- Faculty Mentor of Leave Management Module in e-utilities development under e-Abhiyaan at NIT Raipur
- Departmental Faculty-In-Charge Public and Media Relations Cell at NIT Raipur
- Member in Refreshment Committee in 9th Convocation at NIT Raipur

STTP/ Workshop Organized:

- [1]. Self-Sponsored Workshop on “Medical Signal and Image Processing”, 22-27 Aug. 2016, NIT Raipur.
- [2]. TEQIP Sponsored “Biosensors and Signal Processing”, 22-23 Dec. 2016, NIT Raipur.
- [3]. Self-Sponsored Workshop on “Medical Signal and Image Processing-II”, 22-27 May 2017, NIT Raipur.
- [4]. Self-Sponsored Workshop on “Medical Signal and Image Processing-III”, 25-30 June 2018, NIT Raipur.
- [5]. ATAL Academy Sponsored FDP on “Robotics” (10-14 Dec 2019) at MANIT Bhopal.
- [6]. Self-Sponsored Workshop on “Artificial Intelligence and Machine Learning Applications” (16-20 Dec 2019) at MANIT Bhopal.
- [7]. ATAL Academy Sponsored FDP on “Artificial Intelligence” (11-15 May 2020) at MANIT Bhopal [Online Mode]
- [8]. ATAL Academy Sponsored FDP on “Robotics” (25-29 May 2020) at MANIT Bhopal [Online Mode]
- [9]. Information Security Education and Awareness (ISEA) Project Sponsored STTP on “Cyber Security & Digital Forensics” (23rd to 27th Nov 2020) at MANIT Bhopal [online mode]
- [10]. Information Security Education and Awareness (ISEA) Project Sponsored STTP on “Information Security- Current Trends and Future Perspectives” (15th to 19th March 2021) at MANIT Bhopal [online mode]
- [11]. Self-Sponsored STTP on “Artificial Intelligence and Deep Learning” (17 -21 May 2021) at MANIT Bhopal [online mode]
- [12]. ATAL Academy Sponsored FDP on “Optimization Techniques for Deep Learning” (03-07 Jan 2022) at MANIT Bhopal [Online Mode]
- [13]. Self-Sponsored STTP on “Artificial Intelligence and Deep Learning” (02 -06 Jan 2023) at MANIT Bhopal [online mode]
- [14]. Self-Sponsored workshop on “Artificial Intelligence and Deep Learning” (20 - 24 May 2024) at MANIT Bhopal [online mode]

Hackathon Organized:

1. TEQIP Sponsored Hackathon on Innovation in Toy Technology (29th & 30th Jan 2021) at MANIT Bhopal [online mode] in association with Ministry of Education (MoE), Innovation Cell, AICTE, New Delhi.
2. Kavach Cyber Security 2023 (April 2023) at MANIT Bhopal in association with Ministry of Education (MoE), Innovation Cell, AICTE along with Bureau of Police Research and Development (BPR&D)(MHA) and Indian Cybercrime Coordination Centre (I4C)(MHA).
3. Smart India Hackathon 2023 (Dec 2023) at MANIT Bhopal in association with Ministry of Education (MoE), Innovation Cell, AICTE, New Delhi.
4. Dark Patterns Buster Hackathon 2024 (Jan 2024) at MANIT Bhopal in association with IIT (BHU) Varanasi and Department of Consumer Affairs, Ministry of Consumer Affairs, Food and Public Distribution, Government of India.
5. Public Sector Banks (PSBs) Inter-NIT Hackathon on Cyber Security 2025 (July 2025) at MANIT Bhopal in association with Central Bank of India.
6. National CyberShield Hackathon (Sep 2025) at MANIT Bhopal in association with Madhya Pradesh Police.

Expert Lectures Delivered:

More than 30 lectures in other institutes on topics:

- Genetic Algorithm
- EEG Signal Processing
- Brain Computing Interface
- Neuro-Robotics
- Artificial Intelligence and Machine Learning
- Machine Learning/ CNN Model development in Python
- Basics of Python
- Cognitive Robotics / Human Decision Making
- Brain Computer Interface

Few Recent Expert Lectures:

On “Brain Computer Interface” at Medicaps University Indore (25-09-2024) [Online]

On “EEG and Adaptive Filters” at NIT Raipur (04-10-2024) [Online]

On “Logistic Regression and Naïve Bayes Classifiers” at NIT Raipur in CEC (05-06-2025) [Online]

International Conference Session Chair:

- Conference Session Chair (International Conference on Technology, Research, and Innovation for Betterment of Society (TRIBES– 2021), 17-19 Dec 2021, IIIT Naya Raipur, CG, India
- Conference Session Chair (International Conference on Control, Automation, Power and Signal Processing (CAPS 2021), 10-12 Dec 2021, IIITDM Jabalpur, MP, India
- Conference Session Chair (2nd International Conference on Power, Control and Computing Technologies, (ICPC²T – 2022), 01-03 March 2022, NIT Raipur, CG, India
- Conference Session Chair (4th International Conference on Data Science and Applications (ICDSA 2023), 14-15 July 2023, MNIT Jaipur, RJ, India.

Active Reviewer:

Dr. Mitul Kumar Ahirwal is active reviewer of many reputed journals like:

- IET signal processing
- IET Image processing
- IEEE Transaction on Emerging Trends in Computational Intelligence
- Biomedical Signal Processing (Elsevier)
- Journal on Bioinformatics and Systems Biology (Springer)
- IETE Technical Review (Taylor & Francis)
- Multimedia Tools and Applications (Springer)

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