



SMART ATTENDANCE SYSTEM USING FACE DETECTION WITH BIOMETRIC BACKUP

Diksha Shelake

*UG Student, Department of Electronics and Telecommunication Engineering
SKN Sinhgad College of Engineering, Pandharpur, India
dikshashelake@gmail.com*

Payal Tate

*UG Student, Department of Electronics and Telecommunication Engineering
SKN Sinhgad College of Engineering, Pandharpur, India
tatepayal2005@gmail.com*

Siddhi Shingare

*UG Student, Department of Electronics and Telecommunication Engineering
SKN Sinhgad College of Engineering, Pandharpur, India
siddhishingare2006@gmail.com*

Prof. S. R. Takale

*Assistant Professor, Department of Electronics and Telecommunication Engineering
SKN Sinhgad College of Engineering, Pandharpur, India
swapanil.takale@sknscoe.ac.in*

Abstract:

Traditional attendance systems based on manual roll calls and paper records require considerable time and may result in errors during attendance recording and record management. This project presents a Smart Attendance System Using Face Detection with Biometric Backup and Automated Excel Report Generation for efficient and reliable student attendance management. The system provides a user interface through which subjects can be selected, new students can be enrolled, and attendance sessions can be started or stopped. For an enrolled student, the laptop camera captures the student's face and the system performs face recognition to automatically mark attendance for the selected subject. If the face is not successfully recognized, the system activates fingerprint authentication as a backup method. The fingerprint sensor is interfaced with an ESP32 development board, while an OLED display provides system status information. For new students, the enrollment process includes capturing and storing facial information and registering the student's fingerprint. The hardware unit is powered using a rechargeable battery with a DC-DC buck converter. After the attendance session is completed, the system processes the recorded data and generates a subject-wise Excel attendance report. The proposed system reduces manual effort, provides an additional authentication method when face recognition fails, and simplifies attendance record management. Overall, the system combines computer vision, biometric authentication, embedded hardware, database management, and automated report generation to provide a practical attendance management solution.



Keywords: Smart Attendance System, Face Recognition, Fingerprint Authentication, ESP32, OpenCV, Biometric Attendance, Student Enrollment, MySQL, Excel Report Generation.

1. INTRODUCTION

Attendance management is an important activity in educational institutions, where maintaining accurate records for different students and subjects can be time-consuming. Traditional methods such as manual roll calls and paper-based attendance records require considerable effort and may lead to recording errors. An automated attendance system can reduce this manual work and provide organized digital records.

The proposed system uses face recognition through a laptop camera to identify enrolled students and automatically record attendance for the selected subject. Since face recognition may not always be successful because of lighting conditions, face position, or other factors, fingerprint authentication is provided as a backup method. The fingerprint sensor is connected to an ESP32-based hardware unit with an OLED display for status information.

New students can be registered through the user interface by completing both face enrollment and fingerprint enrollment. During an attendance session, the system first attempts face recognition and switches to fingerprint verification when the face is not recognized. The attendance data is then processed and a subject-wise Excel report is generated, reducing manual record keeping and improving attendance management.

2. LITERATURE SURVEY

T. Verma et al. (2020) [1]: Developed an automated attendance system using facial recognition and image processing techniques. The system identifies registered students and records their attendance digitally.

S. Mehta et al. (2020) [2]: Presented a biometric attendance system using fingerprint authentication. The system provides reliable student identification and reduces errors associated with traditional attendance methods.

L. Nair et al. (2021) [3]: Proposed a camera-based attendance system using face recognition. The system captures facial information and compares it with previously registered data to automatically identify.

A. Kulkarni et al. (2021) [4]: Developed a smart attendance system using facial recognition technology. The proposed approach reduces manual intervention and provides faster attendance recording in classroom environments.

S. Yadav et al. (2022) [5]: Introduced an automated attendance management system that digitally stores student attendance records. The system improves the organization and accessibility of attendance information.

M. Patil et al. (2022) [6]: Proposed a biometric attendance system combining face recognition with



digital attendance management. The system improves efficiency by automating the identification and attendance recording.

N. Tiwari et al. (2022) [7]: Developed a computer vision-based attendance system for automatic student identification. The system processes facial images and records attendance when a registered student is successfully recognized.

K. Deshmukh et al. (2023) [8]: Presented an image-processing-based attendance system using facial recognition. The system identifies enrolled students through captured facial images and maintains digital attendance records.

H. Ahmed et al. (2023) [9]: Proposed a fingerprint-based attendance system for secure student authentication. The system uses biometric verification to improve the reliability of attendance recording.

R. Patel et al. (2023) [10]: Developed an automated attendance system using a camera and face recognition. The system recognizes registered students and records their attendance without requiring manual.

V. Gupta et al. (2023) [11]: Conducted a study on biometric attendance systems and highlighted the advantages of using automated identification techniques for reducing manual attendance errors

T. Begum et al. (2024) [12]: Proposed an automated student attendance system using facial image processing. The system stores registered facial information and uses it for identifying students during attendance sessions.

M. Iqbal et al. (2025) [13]: Developed a biometric attendance management system with digital data storage. The system maintains student information and attendance records in an organized manner.

L. Zhang et al. (2025) [14]: Proposed a smart attendance framework using automated biometric identification. The system focuses on improving the speed, reliability, and efficiency of attendance recording.

A. Singh et al. (2025) [15]: Developed a face recognition-based classroom attendance system. The system automatically identifies enrolled students and records attendance, reducing the need for manual attendance marking.

K. Jain et al. (2026) [16]: Presented a review of biometric-based smart attendance systems. The study highlighted the benefits of combining face recognition and fingerprint authentication to improve identification reliability and reduce manual attendance work.

3. PROPOSED METHODOLOGY

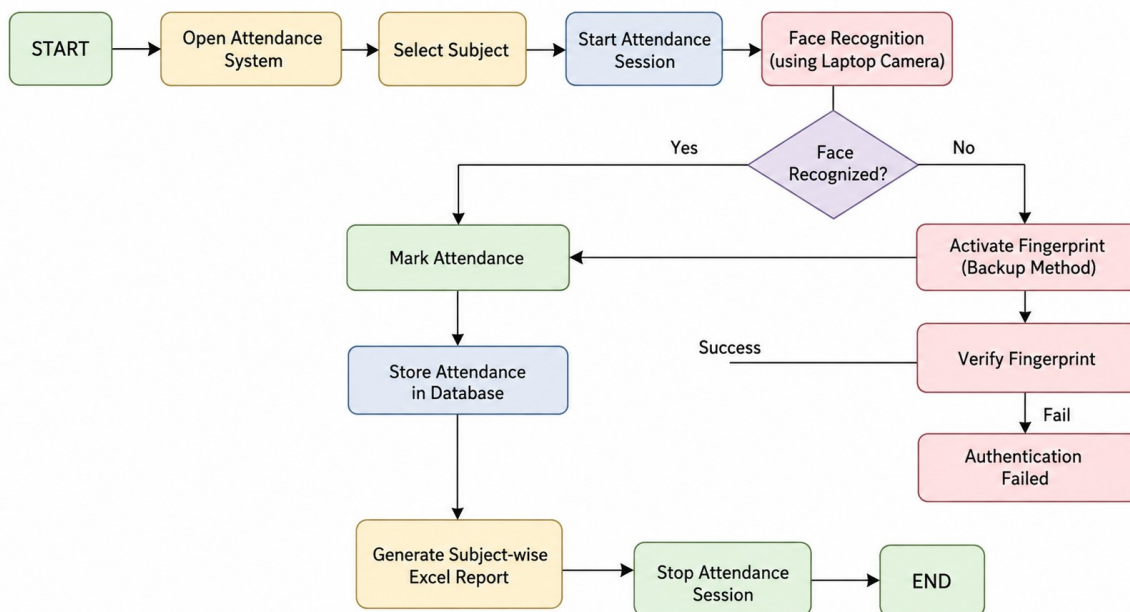


Figure 1 Block Diagram of Proposed System

The proposed Smart Attendance System is developed to automate student attendance by integrating face recognition, biometric fingerprint authentication, embedded hardware, database management, and automated Excel report generation. The system operates through a sequence of processes that include student enrollment, subject selection, face recognition, fingerprint-based backup authentication, attendance recording, data storage, and report generation.

The process begins with the student enrollment stage. When a new student is added through the user interface, the system captures the student's facial information using the laptop camera. The captured facial data is processed and stored so that it can be used for identification during future attendance sessions. Along with face enrollment, the student registers a fingerprint using the fingerprint sensor connected to the ESP32 development board. The fingerprint information provides a backup authentication method if face recognition is unsuccessful.

After the enrollment process is completed, the user can select the required subject through the system interface. The attendance session is then started for the selected subject. Once the session begins, the laptop camera becomes active and continuously captures the faces of students present in the classroom. The face recognition module processes the captured images and compares the detected facial features with the previously enrolled student data.

If a student's face matches the stored facial information, the student's identity is verified and attendance is automatically marked for the selected subject. The system can therefore record attendance without requiring manual calling of student names. The attendance information is



associated with the appropriate student, subject, and attendance session.

In cases where the student's face cannot be successfully recognized, the system activates the fingerprint authentication mode as a backup mechanism. The student places the registered finger on the fingerprint sensor connected to the ESP32 development board. The fingerprint module verifies the received fingerprint against the enrolled fingerprint data. If a valid match is obtained, the student's identity is confirmed and attendance is recorded. The OLED display connected to the hardware provides status information during the fingerprint authentication process.

The ESP32 development board acts as the controller for the fingerprint authentication hardware and communicates with the fingerprint sensor and display. The embedded hardware unit is powered using a rechargeable battery and a DC-DC buck converter. The PCB/breadboard and connecting wires provide the required electrical connections between the hardware components. After successful authentication through either face recognition or fingerprint verification, the attendance record is stored in the database. The database maintains the required student and attendance information in an organized manner. The system ensures that the attendance is associated with the subject selected for the current attendance session.

Once the attendance session is completed, the user selects the Stop Session Attendance option through the interface. The system processes the recorded attendance data and automatically generates a subject-wise Excel attendance report. This report provides an organized digital record that can be used for attendance management and future reference.

Thus, the proposed methodology combines laptop-based computer vision with ESP32-based fingerprint authentication to provide a dual-mode attendance system. Face recognition acts as the primary authentication method, while fingerprint verification provides a backup when facial recognition is unsuccessful. The integration of automated attendance recording, database storage, and Excel report generation reduces manual effort and provides an efficient and organized solution for student attendance management.

4. CONCLUSION

The proposed Smart Attendance System Using Face Recognition with Biometric Backup and Automated Excel Report Generation provides an efficient and reliable solution for student attendance management. The system uses a laptop camera for face recognition as the primary authentication method and an ESP32-based fingerprint sensor as a backup when the student's face is not successfully recognized.

The system provides a complete student enrollment process in which facial information and fingerprints are registered before attendance can be recorded. During an attendance session, the selected subject is monitored through the user interface, and attendance is automatically marked after successful authentication. The ESP32 development board, fingerprint sensor, OLED display, rechargeable battery, and DC-DC buck converter support the biometric backup mechanism.



The recorded attendance data is stored digitally and a subject-wise Excel report is generated after the attendance session. This reduces manual effort, minimizes errors in attendance recording, and makes attendance records easier to manage and maintain.

REFERENCES

1. Badage, R. N., & Karande, K. J. (2016). Use of Information and Communication Technologies (ICT) in career planning of rural youth of India. Proc. the Annual International Conference on Intelligent Computing, Computer.
2. Bhushan, S., & Karande, K. J. (2021). Advancing Social Media Analytics: A Robust Multi-Criteria Decision-Making Model-Based Framework. Webology 18 (6), 9339-9343.
3. Bhushan, S., & Karande, K. J. (2023). ENHANCING RESEARCH IN SOCIAL MEDIA ANALYTICS WITH AN ADVANCED ROBUST MULTI-CRITERIA DECISION MAKING MODEL. Webology.
4. Bokefode, J. D., Swapnaja A, U., Subhash V, P., Kailash J, K., & Sulabha S, A. (2015). Developing secure cloud storage system by applying AES and RSA cryptography algorithms with role based access control model. International Journal of Computer Applications 118 (12), 46-52.
5. Burje, P. R., Karande, K. J., & Jagadale, A. B. (2014). Embedded on-board diagnostics system using CAN network. 2014 IEEE Global Conference on Wireless Computing & Networking (GCWCN), 31-35.
6. Burje, P. R., Karande, K. J., & Jagadale, A. B. (2014). Embedded on-board diagnostics system using CAN protocol. 2014 International Conference on Communication and Signal Processing, 734-737.
7. Daithankar, M. V., & Karande, K. J. (2014). Analysis and integration of skin color models used for human face detection. 2014 IEEE Global Conference on Wireless Computing & Networking (GCWCN), 70-74.
8. Deepika, S., & Karande, K. J. (2021). Distance Log Mar Visual Acuity Comparison With Severity Of Diabetic Retinopathy. Webology (ISSN: 1735-188X) 18 (6).
9. Deshmukh, S. G., Karande, K. J., Ogura, K., Kheraj, V., & Deshmukh, R. S. (2022). Post-Annealing Influence on Structural, Surface and Optical Properties of Cu₃BiS₃ Thin Films for Photovoltaic Solar Cells. Artificial Intelligence, Internet of Things (IoT) and Smart Materials for.
10. Deshmukh, S. G., Kheraj, V., Karande, K. J., & Kulkarni, S. G. (2024). Thin Film Nanomaterials: Synthesis, Properties and Innovative Energy Applications. Bentham science publishers.
11. Deshmukh, S. G., Kheraj, V., Karande, K. J., Panchal, A. K., & Deshmukh, R. S. (2019). Hierarchical flower-like Cu₃BiS₃ thin film synthesis with non-vacuum chemical bath



- deposition technique. *Materials Research Express* 6 (8), 084013.
12. Deshpande, H. S., & Karande, K. J. (2016). A planar microstrip RF energy harvester 3D cube antenna for multiple frequencies reception. 2016 Conference on Advances in Signal Processing (CASP), 327-331.
 13. Deshpande, H., & Karande, K. (2016). Integrated CMOS 3D Microstrip Patch Antenna Prototype for Wireless Energy Harvesting. International Conference on Communication and Signal Processing 2016 (ICCASP).
 14. Deshpande, H., & Karande, K. J. (2018). Energy Optimal Radio Harvester for Multi Sensory System. 2018 IEEE Global Conference on Wireless Computing and Networking (GCWCN), 44-48.
 15. Deshpande, H., Karande, K. J., & Deshmukh, S. G. (2022). RF energy harvesting multi-frequency receptor model for micropower applications. *AIP Conference Proceedings* 2494 (1), 060002.
 16. Dhotre, V., & Karande, K. (2014). Refinement of data streams using Minimum Variance principle. 2014 International Conference on Contemporary Computing and Informatics.
 17. Gade, A. A., Karande, K. J., & Jagadale, A. B. (2015). Space vector modulation based feed control using three phase induction motor. *International Journal of Modern Trends in Engineering and Research* 2 (7), 44-46.
 18. Gaikwad, D. S., & Karande, K. J. (2016). Image processing approach for grading and identification of diseases on pomegranate fruit: An overview. *International Journal of Computer Science and Information Technologies* 7 (2).
 19. Gaikwad, D., Karande, K., & Deshpande, H. (2016). Pomegranate fruit diseases identification and grading. International Conference on Communication and Signal Processing 2016 (ICCASP).
 20. Gidde, N. D., Karande, K. A., Jadhav, S. S., Mistry, R., Mhetre, P., & Joshi, S. (2021). Microsponge: An Overview. *Journal of University of Shanghai for Science and Technology* 23, 671-682.
 21. Hofree, G., Ruvolo, P., Reinert, C., Bartlett, M. S., & Winkielman, P. (2012). Why are you smiling? In a strategic context, people's affective responses reflect the meaning of android's facial expressions. 2012 IEEE International Conference on Development and Learning and.
 22. Ingole, A. L., & Karande, K. J. (2018). Automatic age estimation from face images using facial features. 2018 IEEE Global Conference on Wireless Computing and Networking (GCWCN).
 23. Iyer, B., Nalbalwar, S. L., & Pathak, N. P. (2019). Computing, Communication and Signal Processing: Proceedings of ICCASP 2018. Springer.
 24. Jadhav, G. R., & Karande, K. J. (2014). Automatic vehicle number plate recognition for vehicle parking management system. *Computer Engineering and Intelligent Systems*, ISSN,



2222-1719.

25. Jadhav, G. R., & Karande, K. J. (2015). Extraction of Vehicle Number Plate. International Journal of Innovations in Engineering and Techonology 6 (2).
26. Joshi, A., & Karande, K. (2023). Comprehensive survey on analysis and modelling of femur bone fracture for an operative planning. Computer Methods in Biomechanics and Biomedical Engineering: Imaging.
27. Joshi, A., & Karande, K. (2023). Comprehensive Way for Modeling of Femur Bone Fracture from CT Images. International Conference on Emerging Trends in Artificial Intelligence, Data.
28. Joshi, A., Karande, K., & Gunaki, R. (2025). FEA-based Virtual Operation and Stress Distribution Analysis of DHS Screws in Proximal Femoral Bone Fractures: A Strategic Guide for Orthopedic Surgeons in Operational Planning. Journal of Pharmacology and Pharmacotherapeutics 16 (2), 202-213.
29. Kailash J Karande, N. V. I. (2021). Multimodal Image Fusion Technique for Automated Correlation Identification in Medical Images. AU Patent 2,021,105,871.
30. Kailash J, K. (2012). Modified Modular Independent Component Analysis (ICA) Approach for Face Recognition. INTERNATIONAL CONFERENCE ON INFORMATION TECHNOLOGY, ELECTRONICS AND.
31. Kailash, K., Raza, A., Mahalingham, S., & Talwalkar, S. (2012). Outcome of universal-2 total wrist arthroplasty for rheumatoid arthritis: our experience at Wrightington. Orthopaedic Proceedings 94 (SUPP_XXXIX), 143-143.
32. Kale, K. V. (2008). Advances in computer vision and information technology. IK International Publishing House.
33. Karande, J. K., Talbar, N. S., & Inamdar, S. S. (2012). Face recognition using Oriented Laplacian of Gaussian (OLOG) and Independent Component Analysis (ICA). Digital Information and Communication Technology and it's Applications.
34. Karande, K. J. (2012). Multiscale wavelet based edge detection and Independent Component Analysis (ICA) for Face Recognition. 2012 International Conference on Communication, Information & Computing.
35. Karande, K. J. (2013). Localized spatiotemporal modular ICA for face recognition. 2013 IEEE Symposium on Computational Intelligence in Biometrics and Identity.
36. Karande, K. J. (2020). Preface. IOP Conf.series.materail science and engg 814, 011001.
37. Karande, K. J. (2022). Feed Dispense Monitoring Machine for Accurate Feeding of Hens in Poultry House. IN Patent 202,221,010,527 A.
38. Karande, K. J., & Badage, R. N. (2016). Facial feature extraction using independent component analysis. Proceedings of the Annual International Conference on Intelligent



Computing.

39. Karande, K. J., & Prasad, P. S. (2020). Model Driven Methodology for JAVA. Unpublished.
40. Karande, K. J., & Talbar, S. N. (2007). Simplified and modified approach for face recognition using PCA. 2007 IET-UK International Conference on Information and Communication.
41. Karande, K. J., & Talbar, S. N. (2008). Face recognition under variation of pose and illumination using independent component analysis. ICGST-GVIP, ISSN.
42. Karande, K. J., & Talbar, S. N. (2009). Independent component analysis of edge information for face recognition. International Journal of Image Processing IJIP 3 (3), 120-130.
43. Karande, K. J., Katti, V. S., Sambhoji, S. S., Patil, K., Killedar, S., & Chavan, S. (2026). Secure Image Steganography: Comparing LSB, AES-LSB, and Steghide. 2026 IEEE International Conference on Industry 4.0, Artificial Intelligence.
44. Kasture, A. M., Karande, K. J., & Nawale, S. D. (2024). Optimization of Harmonic Generation in Frequency Multiplying Circuit for Wireless Application. 2024 3rd Edition of IEEE Delhi Section Flagship Conference (DELCON), 1-5.
45. Kasture, A., Karande, K., & Nawale, S. (2024). Performance Analysis of Various Nonlinear Elements in Frequency Multiplying Circuits for Wireless Applications. INTERNATIONAL JOURNAL 12 (4), 1332-1336.
46. Katti, V. S., & Karande, K. J. (2025). Emerging Trends and Innovations in Sentiment Analysis: A Comprehensive Review. International Conference on ICT for Sustainable Development, 158-166.
47. Katti, V., & Karande, K. J. (2025). Personalized depression management system using llms and reinforcement learning: A survey. International Conference on Recent Trends in Machine Learning, IOT, Smart.
48. Kawathekar, P. P., & Karande, K. J. (2014). 2014 International Conference on Signal propagation and computer technology (ICSPCT 2014). IEEE.
49. Kawathekar, P. P., & Karande, K. J. (2014). Severity analysis of Osteoarthritis of knee joint from X-ray images: A Literature review. 2014 International Conference on Signal propagation and computer technology.
50. Kawathekar, P. P., & Karande, K. J. (2015). Use of textural and statistical features for analyzing severity of radio-graphic osteoarthritis of knee joint. 2015 International Conference on Information Processing (ICIP), 1-4.
51. Kendule, J. A., & Karande, K. (2024). A Survey of Internet of Things Frameworks for Crowd Management System. Modern Approaches in Machine Learning and Cognitive Science: A Walkthrough.
52. Kendule, J. A., & Karande, K. J. (2023). Variable Synergic Squeeze Convolutional Equilibrium Network Enabled Crowd Management in IoT. International Journal of Image, Graphics and



Signal Processing 15 (4), 69.

53. Lale, D. P., & Karande, K. J. (2016). Gender classification using facial features. *Int. J. Adv. Res. Electron. Commun. Eng.(IJARECE)* 5 (9), 2227-2231.
54. Mahajan, A. S. B., & Karande, K. J. (2015). PCA and DWT based multimodal biometric recognition system. *2015 International Conference on Pervasive Computing (ICPC)*, 1-4.
55. Mahesh, K. K., Kishore, P., & Kailash, J. K. (2017). Survey on iris image analysis. *Indian J. Sci. Technol* 10 (9), 1-15.
56. Mulay, A. V., & Karande, K. J. (2016). Water quality monitoring system based on wireless sensor network. *International Journal of Innovations in Engineering Research and Technology*, 1-4.
57. Mulik, S., Dhobale, N., Pujari, K., & Karande, K. (2022). The Use of Artificial Intelligence-Based Models for Biomedical. *Artificial Intelligence, Internet of Things (IoT) and Smart Materials for*.
58. Nagaswarupa, H. P., Sillanpää, M. E. T., Murthy, H. C. A., & Naik, R. (2024). *Multifunctional inorganic nanomaterials for energy applications*. CRC Press.
59. Nandgaonkar, V. N., & Karande, K. J. (2021). Significance Of Artificial Intelligence and Machine Learning Algorithms in Brain Tumor Diagnosis. *Solid State Technology* 64 (2), 7125-7131.
60. Patil, P. G., & Karande, K. J. (2016). Brain tumor detection techniques: a survey. *Int Res J Eng Technol (IRJET)* 3 (10).
61. Patil, P. G., Karande, K. J., & Surwase, S. V. (2022). Detection of brain tumor using optimized fuzzy C-means and SVM classifier. *AIP Conference Proceedings* 2494 (1), 020007.
62. Shaikh, K. M., Karande, K. J., & Surwase, S. V. (2018). Nested slot suspended patch antenna using CST microwave studio. *2018 International Conference on Information, Communication, Engineering and*.
63. Surwase, S. V., & Karande, K. J. (2014). Technical aspects in development of Marathi calculator using text to speech synthesizer. *2014 IEEE Global Conference on Wireless Computing & Networking (GCWCN)*, 92-96.
64. Unnikrishnan, S., Surve, S., & Bhoir, D. (2011). *Advances in Computing, Communication and Control: International Conference, ICAC3 2011, Mumbai, India, January 28-29, 2011. Proceedings*. Springer Science & Business Media.
65. Unnikrishnan, S., Surve, S., & Bhoir, D. (2013). *Advances in Computing, Communication, and Control: Third International Conference, ICAC3 2013, Mumbai, India, January 18-19, 2013, Proceedings*. Springer.
66. Aasawari Boxey, D. A. O. M., Jadhav, A., Gade, P., & Ghanti, P. (2022). Face Recognition using Raspberry Pi. *Journal of Image Processing and Intelligent Remote Sensing* 2 (4), 15-23.



67. ABHANGRAO, M. R., JADHAV, M. S., GHODKE, M. P., & Mulani, A. (2017). Design And Implementation Of 8-bit Vedic Multiplier. International Journal of Research Publications in Engineering and Technology.
68. Aiwale, S., Kolte, M. T., Harpale, V., Bendre, V., Khurge, D., & Bhandari, S., et al. (2024). Non-invasive anemia detection and prediagnosis. Journal of Pharmacology and Pharmacotherapeutics 15 (4), 408-416.
69. Altaf O. Mulani, M. S., & Jadhav, M. M. (2022). Painless Machine Learning approach to estimate blood glucose level of non-invasive device. Artificial Intelligence, Internet of Things (IoT) and Smart Materials for.
70. Altaf O. Mulani, P. G. F., Sardey, M. P., Kinage, K., & Sadanand, S., et al. (2024). ML-powered Internet of Medical Things (MLIoMT) Structure for Heart Disease Prediction. Journal of Pharmacology and Pharmacotherapeutics 16 (1), 1-8.
71. Anil, D., & A. O., M. (2024). Smart farming using IOT based Agri BOT. Naturalista Campano 28 (1), 723-729.
72. AnnaSaheb S Dandage, A. O. M., Rupnar, V. R., & Pise, T. A. (2025). IoT-Powered Weather Monitoring and Irrigation Automation: Transforming Modern Farming Practices. International Journal of Telecommunications & Emerging Technologies 11 (1).
73. Aryan Ganesh Nagtilak, A. O. M., Ulegaddi, S. N., & Mane, M. (2023). Automatic Solar Powered Pesticide Sprayer for Farming. International Journal of Microwave Engineering and Technology 9 (2).
74. Babaladi, S. S., & Mulani, A. O. (2026). An Overview on Timely Detection of Plant Leaf Disorder Using Deep Learning and Machine Learning Models. 2026 Contemporary Computing Innovations Conference (CCIC), 1-6.
75. Basawaraj Birajadar, G., Osman Mulani, A., Ibrahim Khalaf, O., & Farhah, N., et al. (2024). Epilepsy identification using hybrid CoPro-DCNN classifier. University of Bahrain.
76. Bhanvase, T. M., Mulani, A. O., & Pise, A. C. (2025). Guava Disease Detection Using Deep Convolutional Neural Networks. 2025 IEEE 7th International Conference on Cybernetics, Cognition and Machine.
77. Chaudhari, K. R., Mulani, A. O., Gajare, M. P., Jadhav, V., Yawle, P., & Bang, A. V. (2026). Bit error rate analysis of various error correction codes with concatenated RS-convolutional codes. Journal of Discrete Mathematical Sciences and Cryptography 29 (1), 199-214.
78. Deshmukh, A. B., Deshmukh, M. T., Chincholkar, Y. D., Patil, A. S., & Mulani, A. O. (2026). Predictive modeling of drug release kinetics using supervised machine learning algorithms. Int. J. Drug Deliv. Technol 16, 978-986.
79. Gadade, B., & Mulani, A. (2022). Automatic system for car health monitoring. International Journal of Innovations in Engineering Research and Technology.



80. Gadade, B., Mulani, A. O., & Harale, A. D. (2024). Iot based smart school bus and student monitoring system. *Naturalista Campano* 28 (1), 730-737.
81. Gadade, B., Mulani, A. O., & Harale, A. D. (2024). IoT Based Smart School Bus and Student Tracking System. *IoT Based Smart School Bus and Student Tracking System*.
82. Ghodake, R. G., & Mulani, A. O. (2016). Microcontroller based automatic drip irrigation system. *Techno-societal 2016, international conference on advanced technologies for*.
83. Ghodke, R. G., Birajdar, G. B., Mulani, A. O., Shinde, G. N., & Pawar, R. B. (2024). Design and Development of an Efficient and Cost-Effective surveillance Quadcopter using Arduino. *Sanshodhak*.
84. Ghodke, R. G., Birajdar, G. B., Mulani, A. O., Shinde, G. N., & Pawar, R. B. (2024). Design and Development of Wireless Controlled ROBOT using Bluetooth Technology. *Sanshodhak*.
85. Jadhav, D. V. S., Salunke, G. D., Chaudhari, K. R., Mulani, D. A. O., & Thigale, D. S. P., et al. (2024). Deep Learning-Based Face Mask Recognition in Real-Time Photos and Videos, *Afr. J. Biomed. Res* 27.
86. Jadhav, D. V. S., Salunkhe, D. S. S., Salunkhe, D. G., Yawle, P. R., & Pol, D. R. S., et al. (2024). Iot Based Health Monitoring System for Human, *Afr. J. Biomed. Res* 27.
87. Jadhav, H. M., Mulani, A., & Jadhav, M. M. (2022). Design and development of chatbot based on reinforcement learning. *Machine learning algorithms for signal and image processing*, 219-229.
88. Jadhav, K. P., Pawar, A., Shinde, A., Salunkhe, R., Sarade, V., & Mulani, A. O. (2024). IOT Based Industrial Power Loss Reducer Using Power Compensation. *International Conference on Data Science, Machine Learning and Applications*.
89. Jadhav, V. S., Salunkhe, S. S., Salunkhe, G., Yawle, P. R., Pol, R. S., & Mulani, A. O., et al. (2024). IOT based health monitoring system for Human. *African Journal of Biomedical Research*, 1309-1315.
90. Kalyankar, P. A., Mulani, A. O., Thigale, S. P., Chavhan, P. G., & Jadhav, M. M. (2022). Scalable face image retrieval using AESC technique. *Journal Of Algebraic Statistics* 13 (3), 173.
91. Kambale, K. S., Sawant, N. M., Mulani, A. O., More, V. P., & Zambare, S. A. (2024). RNN-LSTM Based Model for Automatic Heart Disease Prediction Using the UCI Heart Disease Dataset. *International Conference on Data Science, Machine Learning and Applications*.
92. Kamble, A., & Mulani, A. O. (2022). Google assistant-based device control. *Int. J. of Aquatic Science* 13 (1), 550-555.
93. Kapase, P., Shrikhande, P., & Lokhande, S. (2022). IOT based plant monitoring system.
94. Karche, S. N., & Mulani, A. O. (2023). AESC Technique for Scalable Face Image Retrieval. *International Journal of Innovative Research in Computer and Communication ...* 52*



- Electric vehicle parameters estimation using Web portal AO Mulani Recent Trends in Electronics and Communication Systems 10 (3).
95. Kedar, M. S., & Mulani, A. (2021). IoT based soil, water and air quality monitoring system for pomegranate farming. Journal of Electronics, Computer Networking and Applied Mathematics (JECNAM).
 96. Kolekar, S. D., Walekar, V. B., Patil, P. S., Mulani, A. O., & Harale, A. D. (2022). Password Based Door Lock System. Int. J. of Aquatic Science 13 (1), 494-501.
 97. Kolhe, V. A., Pawar, S. Y., Gohery, S., Mulani, A. O., Sundari, M. S., & Kiradoo, G., et al. (2024). Computational and experimental analyses of pressure drop in curved tube structural sections of Coriolis mass flow metre for laminar flow region. Ships and Offshore Structures 19 (11), 1974-1983.
 98. Kulkarni, P. R., Mulani, A. O., & Mane, P. B. (2016). Robust invisible watermarking for image authentication. Emerging Trends in Electrical, Communications and Information Technologies.
 99. Kulkarni, T. M., Mulani, A. O., & Madan, T. (2024). Deep Learning Based Face-Mask Detection: An Approach to Reduce Pandemic Spreads in Human Healthcare. African Journal of Biological Sciences 6 (6).
 100. Kutubuddin Sayyad Liyakat, K., O Mulani, A., Ibrahim Khalaf, O., & Algburi, S., et al. (2024). IoT Devices for Monitoring Health Status and Vital Signs in Patients with Cancer. International Journal of Computing and Digital Systems 16 (1), 1-12.
 101. Liyakat, K. K. S., Warhade, N. S., Pol, R. S., Jadhav, H. M., & Mulani, A. O. (2022). Yarn quality detection for textile industries using image processing. Journal Of Algebraic Statistics 13 (3), 3465-3472.
 102. M., C. J. M. (2021). Machine Learning based Autonomous Fire Combat Turret. Turkish Journal of Computer and Mathematics Education (TURCOMAT) 12 (2).
 103. Mandwale, A. J., & Mulani, A. O. (2015). Different Approaches For Implementation of Viterbi decoder on reconfigurable platform. 2015 International Conference on Pervasive Computing (ICPC), 1-4.
 104. Mandwale, A. J., & Mulani, A. O. (2016). Implementation of High Speed Viterbi Decoder using FPGA. International Journal of Engineering Research & Technology (IJERT) 5 (2).
 105. Mandwale, A., & Mulani, A. O. (2014). Implementation of convolutional encoder & different approaches for viterbi decoder. IEEE International Conference on Communications, Signal Processing Computing.
 106. Mane, A. (2015). Area Efficient Technique for implementation of Discrete Wavelet Transform on FPGA. IEEE Conference on Engineering & Technology (ICETECH).



107. Mane, A. (2017). An Efficient implementation of DWT for image compression on reconfigurable platform. *International Journal of Control Theory and Applications* 10 (15), 7.
108. Mane, A. (2018). High-Speed Area-Efficient Implementation of AES Algorithm on Reconfigurable Platform. *Computer and Network Security*.
109. Modi, S., Misal, V., Kulkarni, S., & Mulani, A. O. (2025). Plant Health AI Analyzer Using Supervised Learning. *Plant Health* 5 (4).
110. More, S. S., & Mulani, A. O. (2024). Deep Learning Assisted Analysis of Ocular Multi Diseases-A Review. *International Conference on Data Science, Machine Learning and Applications*.
111. More, S. S., & Mulani¹, A. O. (2026). Deep Learning Assisted Analysis of Ocular. *Proceedings of the 6th International Conference on Data Science, Machine*.
112. Mulani, A. O. (2016). *Optical Communication*. Electrotech Publications, Satara.
113. Mulani, A. O. (2025). A Robust Image Watermarking Framework Integrated with AES Encryption for Secure Digital Media Protection. *Journal of Advancement in Electronics Signal Processing* 2 (3), 47-56.
114. Mulani, A. O. (2025). Electric Vehicle Parameters Estimation Using Web Portal, *Recent Trends in Electronics & Communication Systems*, Volume 10, Issue 3, 2023. *International Open-Access, Double-Blind Multidisciplinary Online* 5 (4).
115. Mulani, A. O., & Kulkarni, T. M. (2023). Face mask detection system using deep learning: a comprehensive survey. *International Conference on Emerging Trends in Artificial Intelligence, Data*.
116. Mulani, A. O., & Mane, P. (2018). Secure and area efficient implementation of digital image watermarking on reconfigurable platform. *International Journal of Innovative Technology and Exploring Engineering* 8.
117. Mulani, A. O., & Mane, P. B. (2014). Area optimization of cryptographic algorithm on less dense reconfigurable platform. *2014 International Conference on Smart Structures and Systems (ICSSS)*, 86-89.
118. Mulani, A. O., & Mane, P. B. (2016). Area efficient high speed FPGA based invisible watermarking for image authentication. *Indian journal of Science and Technology* 9 (39), 1-6.
119. Mulani, A. O., & Mane, P. B. (2017). Fast and Efficient VLSI implementation of DWT for image compression. *International Journal for Research in Applied Science and Engineering*.
120. Mulani, A. O., & Shinde, G. N. (2021). An approach for robust digital image watermarking using DWT-PCA. *Journal of Science and Technology* 6 (1).
121. Mulani, A. O., Bang, A. V., Birajadar, G. B., Deshmukh, A. B., & Jadhav, H. M., et



- al. (2024). IoT based air, water and soil monitoring system for pomegranate farming.
122. Mulani, A. O., Birajadar, G., Ivković, N., Salah, B., & Darlis, A. R. (2023). Deep learning based detection of dermatological diseases using convolutional neural networks and decision trees. *Traitement du Signal* 40 (6), 2819.
 123. Mulani, A. O., Deshmukh, M., Jadhav, V., Chaudhari, K., & Mathew, A. A., et al. (2025). Transforming drug therapy with deep learning: the future of personalized medicine. *Drug Research* 75 (08), 326-333.
 124. Mulani, A. O., Jadhav, M. M., & Seth, M. (2022). Painless Non-invasive blood glucose concentration level estimation using PCA and machine learning. The CRC Book entitled Artificial intelligence, Internet of Things (IoT) and.
 125. Mulani, A. O., Liyakat, K. K. S., Warade, N. S., Patil, A., Kolte, M. T., Kinage, K., & Rana, M., et al. (2026). Iot sensors in a wireless environment for healthcare monitoring: A framework for fault detection. *Journal of Pharmacology and Pharmacotherapeutics* 17 (1), 94-100.
 126. Mulani, A. O., Modi, S. P., Misal, V. M., & Kulkarni, S. R. (2026). Development of an Eco-Efficient Pesticide Spraying Rover for Sustainable Farming. 2026 IEEE International Conference on Emerging Computing and Intelligent.
 127. Mulani, A. O., Patil, R. M., & Liyakat, K. K. S. (2023). DISCRIMINATIVE APPEARANCE MODEL FOR ROBUST ONLINE MULTIPLE TARGET TRACKING.
 128. Mulani, A. O., Patil, R. M., & Liyakat, K. K. S. (2023). Modelo de apariencia discriminatorio para un sólido seguimiento en línea de múltiples objetivos. *Télématique: Revista Electrónica de Estudios Telemáticos* 22 (1), 24-43.
 129. Mulani, A. O., Warade, N. S., Khalaf, O. I., Bsoul, Q., Waghole, D., & Jadhav, M., et al. (2025). Resource management optimisation of OFDM-IDMA system for 5G multi-tier backhaul networks. *Egyptian Informatics Journal* 31, 100756.
 130. Mulani, A., & Mane, P. B. (2016). DWT based robust invisible watermarking. Scholars' Press.
 131. Mulani, D. (2016). Design of Computer/Laptop independent data transfer system from one USB flash drive to another using ARM 11 processor. *International Journal of Science, Engineering and Technology Research* 5 (12).
 132. Mulani, D. A. (2025). Design and Implementation of 256-bit Vedic Multiplier on Reconfigurable Platform. *Journal of Materials & Metallurgical Engineering* 15 (3).
 133. Mulani, D. A. O. (2019). Effect of rotation and projection on real time hand gesture recognition system for human computer interaction. *Journal of The Gujrat Research Society* 21 (16), 3710-3718.
 134. Mulani, D. A. O. (2024). A comprehensive survey on semi-automatic solar-powered



pesticide sprayers for farming. Journal of Energy Engineering and Thermodynamics (JEET) ISSN, 2815-0945.

135. Mulani, P. (2018). High Speed Area Efficient FPGA Implementation of AES Algorithm. Institute of Advanced Engineering and Science 7 (3), 157-165.
136. Mulani, P. (2019). High throughput and area efficient FPGA Implementation of AES algorithm. International Journal of Engineering and Advanced Technology 8 (4), 519-523.
137. Mulani, P. K. (2015). Application of MATLAB for Second Level Discrete Wavelet Transform through Filter Bank. International Conference on Engineering and Technology (ICETECH), 4.
138. Mulani, P. K. (2015). Robust invisible Watermarking for image authentication. ICECIT 2015, 4.
139. Mulani, P. R. K. (2015). Robust Invisible Digital Image Watermarking using Discrete Wavelet Transform. International Journal of Engineering Research & Technology (IJERT) 4 (01), 3.
140. Mulani, R. (2015). Analysis of Biomedical image using wavelet transformation. International Journal of Innovations in Engineering Research and Technology.
141. Mulani, R. A. O., Ganjewar, S. P., Kadu, P. S., & Khadke, R., et al. (2020). Smart Ration Automated Teller Machine For Pandemic Situations. IN Patent App. 202,021,048,830.
142. Mulani, R. G. A. O. (2016). Sensor based Automatic Drip Irrigation System. Journal for Research 2 (2), 53-56.
143. Mulani, R. K. A. O. (2017). Raspberry pi based voice operated Robot. International Journal of Recent Engineering Research and Development 2 (12).
144. Mulani, T. (2024). Face Mask Detection on Real Time Images and Videos using Deep Learning. International Journal of Electrical Machine Analysis and Design (IJEMAD) 2.
145. Nagane, U. P., & Mulani, A. O. (2021). Moving Object Detection and Tracking Using Matlab. Journal of Science and Technology 6 (Special Issue 1).
146. Nagrale, M., Pol, R. S., Birajadar, G. B., Mulani, A. O., Kutubuddin, K., & Liyakat, S. (2024). Internet of robotic things in cardiac surgery: an innovative approach. Afr J Biol Sci 6 (6), 709-725.
147. Nagtilak, M. A. G., Ulegaddi, M. S. N., Adat, M. A. S., & Mulani, A. O. (2021). Breast Cancer Prediction using Machine Learning. International Journal of Research in Science and Engineering 1 (2).
148. Pathan, A. N., Shejal, S. A., Salgar, S. A., Harale, A. D., & Mulani, A. O. (2022). Hand gesture controlled robotic system. Int. J. of Aquatic Science 13 (1), 487-493.
149. Pol, D. R. S., Deshmukh, A. B., Jadhav, M. M., Liyakat, K. K. S., & Mulani, A. O. (2022). I



Button Based Physical Access Grid Based Realistic Optimal Path Planning. Journal of Algebraic Statistics, 11987-12002.

150. Pol, R. S., Bhalerao, M. V., & Mulani, A. O. (2022). A real time IoT based System Prediction and Monitoring of Landslides. International Journal of Food and Nutritional Sciences 11 (7).

151. Rahul, G. G., & Mulani, A. O. (2025). Microcontroller Based Drip Irrigation System. International Open-Access, Double-Blind, Peer-Reviewed, Refereed. Multidisciplinary Online 5 (4).

152. S.Pol, D. D. R. (2021). Cloud Based Memory Efficient Biometric Attendance System Using Face Recognition. Stochastic Modeling & Applications 25 (2), 403-416.

153. Sawant, N. M., Mulani, A. O., Kondooru, S., Linge, S. G., Gawande, P. G., & Koli, M. S. (2024). AgriRent: Renting the Farm Equipment. International Conference on Data Science, Machine Learning and Applications.

154. Shinde, G., & Mulani, A. (2019). A ROBUST DIGITAL IMAGE WATERMARKING USING DWT -PCA. International Journal of Innovations in Engineering Research and Technology.

155. Shinde, M., & Mulani, A. (2021). Effects Of Foot Reflexology On Lactation In Postnatal Mothers At A Tertiary Care Hospital In Karad. International Journal Of Current Research And Review 13 (16), 225-229.

156. Shinde, R., & Mulani, A. O. (2015). Analysis of Biomedical Imagell. International Journal on Recent & Innovative trend in technology (IJRITT).

157. Shinde, R., & Mulani, A. O. (2015). Biomedical Image fusion using Wavelet transform. International Conference On Current Advances in Electronics, Electrical and.

158. Singh, S., Arya, K. V., Rodriguez, C. R., & Mulani, A. O. (2025). Emerging Trends in Artificial Intelligence, Data Science and Signal Processing.

159. Swami, S. S., & Mulani, A. O. (2017). An efficient FPGA implementation of discrete wavelet transform for image compression. 2017 International Conference on Energy, Communication, Data Analytics and.

160. Takale, D. A. M. S. (2023). A video watermarking technique with video and image as watermark using DWT and PCA. Journal of Northeastern University 25.

161. Takale, S., & Mulani, A. (2022). DWT-PCA based video watermarking. Journal of Electronics, Computer Networking and Applied Mathematics (JECNAM).

162. Takale, S., & Mulani, A. (2022). Video Watermarking System. International Journal for Research in Applied Science and Engineering.

163. Thigale, S. P., Jadhav, H. M., Mulani, A. O., Birajadar, G. B., Nagrale, M., & Sardey, M. P. (2024). Internet of things and robotics in transforming healthcare services. Afr J Biol Sci (S Afr) 6



(6), 1567-1575.

164. Ughade, U. R., Gikwad, S. M., Yeole, A. N., & Mulani, D. A. O. (2023). Automatic attendance system using face recognition. *Journal of Image Processing and Intelligent Remote Sensing* 3 (4), 11-18.
165. Anjali Pise, K. K. (2025). A Genetic Algorithm-Driven Energy-Efficient Routing Strategy for Optimizing Performance in VANETs. *Engineering, Technology & Applied Science Research* 15 (No. 5, 2025), 27273-27278.
166. Pise, A. C., & Karande, D. K. J. (2021). An exploratory study of cluster based routing protocol in VANET: a review. *International Journal of Advanced Research in Engineering and Technology*.
167. Pise, A. C., & Karande, K. J. (2023). Energy-Efficient Optimal Routing Protocols in VANETs. 66th Annual IETE Convention, AIC-2023 September 16-17.
168. Pise, A. C., & Karande, K. J. (2024). Investigating Energy-Efficient Optimal Routing Protocols for VANETs: A Comprehensive Study. *International Conference on Information and Communication Technology for*.
169. Pise, A. C., & Karande, K. J. (2024). K-mean energy efficient optimal cluster based routing protocol in vehicular ad-hoc networks. *Modern Approaches in Machine Learning and Cognitive Science: A Walkthrough*.
170. Pise, A. C., & Karande, K. J. (2025). Architecture, Characteristics, Applications and Challenges in Vehicular Ad Hoc Networks. 27th IEEE International Symposium on Wireless Personal Multimedia.
171. Pise, A. C., & Karande, K. J. (2025). Cluster head selection based on ACO in vehicular ad-hoc networks. *Machine Learning for Environmental Monitoring in Wireless Sensor Networks*.
172. Pise, A., & Karande, K. (2025). Hybrid Remora Optimization Algorithm for Energy Efficient Optimal Routing Scheme in VANETs. *International Journal of Intelligent Engineering & Systems* 18 (9), 584.
173. Shejwal, V., Karande, K. J., & Pise, A. C. (2025). Automated Pomegranate Disease Detection and Classification Using Vision Transformer. *International Conference on Recent Trends in Machine Learning, IOT, Smart*.
174. Dhanawadel, A., Mulani, A. O., & Pise, A. C. (2024). IOT based Smart farming using Agri BOT. *Sanshodhak*.
175. Maske, Y., Jagadale, A. B., Mulani, A. O., & Pise, A. C. (2023). Development of BIOBOT system to assist COVID patient and caretakers. *European Journal of Molecular & Clinical Medicine* 10 (01), 2023.
176. Nale, D., Pise, A. (2025). Web Based – Application for Result Analysis. In: Singh, S.,



Arya, K.V., Rodriguez, C.R., Mulani, A.O. (eds) Emerging Trends in Artificial Intelligence, Data Science and Signal Processing. AIDSP 2023. Communications in Computer and Information Science, vol 2439. Springer, Cham. https://doi.org/10.1007/978-3-031-88759-8_1D.

177. D. Nale and A. C. Pise, Smart Result Analysis-pdf Extractor, 2024 IEEE International Students' Conference on Electrical, Electronics and Computer Science (SCEECS), Bhopal, India, 2024, pp. 1-6, doi: 10.1109/SCEECS61402.2024.10482279.

178. C. Pise, Jadhav P., Detection of Cast Iron Composition by Cooling Curve Analysis using Thermocouple Temperature Sensor, 2nd International Conference on Engineering Technology, Science and Management Innovation (ICETSMI – 2018), 2nd September 2018.

179. C. Pise, Facial Expression Recognition Using Facial Features, IEEE International Conference on Communication and Electronics Systems (ICCES 2018), October 2018.

180. C. Pise, Jadhav P, Estimating Parameters of Cast Iron Composition using Cooling Curve Analysis, IEEE International Conference on Communication and Electronics Systems (ICCES 2018), Coimbatore, October 2018.

181. Pise, A. C. (2016, December). Android based Portable Health Support System. In International Conference on Innovations in Engineering and Technology (CIET 2016), SKN Sinhgad College of Engineering (pp. 30-31).

182. A Pise, A. C. (2016, December). Baysian Classifier & FCM Segmentation for Lung Cancer Detection in early stage. In International Conference on Innovations in Engineering and Technology (CIET 2016), SKN Sinhgad College of Engineering (pp. 30-31).

183. Pise, A. C. (2016, December). Cast Iron Composition Measurement by Coding Curve Analysis. In International Conference on Innovations in Engineering and Technology (CIET 2016), SKN Sinhgad College of Engineering (pp. 30-31).

184. Pise, A. C. (2016, December). War field Intelligence Defence Flaging Vehicle. In International Conference on Innovations in Engineering and Technology (CIET 2016), SKN Sinhgad College of Engineering (pp. 30-31).

185. C. Pise, [Segmentation of Optic](#) Disk and Optic Cup from retinal Images, ICEECMPE – Chennai, June 2015

186. Pise, A. C. (2015, April). Diseases Detection of Pomegranate Plant. In IEEE sponsored International Conference on Computation of Power, Energy, Information and Communication (pp. 22-23).

187. P. V. Bankar and A. C. Pise, Face recognition by using Gabor and LBP, 2015 International Conference on Communications and Signal Processing (ICCSP), Melmaruvathur, India, 2015, pp. 0045-0048, doi: 10.1109/ICCSP.2015.7322425.

188. Lole, A. C. Pise and S. V. Surwase, Efficient implementation of UTAMF Algorithm for edge preservation on FPGA, 2015 International Conference on Green Computing and Internet of



Things (ICGCIoT), Greater Noida, India, 2015, pp. 667-670, doi: 10.1109/ICGCIoT.2015.7380547.

189. Pise, A. C. (2014). Single Chip Solution For Multimode Robotic Control. Ist IEEE International Conference on Computing Communication and Automation, 26-27.

190. S. A. Thite, A. C. Pise and A. B. Jagadale, Single Chip Solution for Multimode Robotic Control, 2015 International Conference on Computing Communication Control and Automation, Pune, India, 2015, pp. 555-557, doi: 10.1109/ICCUBE.2015.114.

191. Lole Bhagyashri A., Pise A.C and Surwase S. V., Area optimized implementation of unsymmetric trimmed adaptive Median Filter for edge preservation on FPGA, 2015 International Conference on Green Computing and Internet of Things (ICGCIoT), Greater Noida, India, 2015, pp. 86-89, doi: 10.1109/ICGCIoT.2015.7380434.

192. Pise, A. C., & Katti, V. S. (2014), Efficient Design for Monitoring of Greenhouse Parameters using Zigbee Wireless Sensor Network. In fifth SARC international conference IRF, IEEE forum ISBN (pp. 978-93).

193. Pise, A. C., & Bankar, P. (2014, April). Face Recognition using Color Local Texture Features. In International Conference on Electronics and Telecommunication, Electrical and Computer Engineering.

194. Pise, A. C. (2014, April). Monitoring parameters of Greenhouse using Zigbee Wireless Sensor Network. In 1st International Conference on Electronics and Telecommunication, Electrical and Computer Engineering (pp. 5-6).

195. Pise, A., & Deshmukh, A. (2010, April). Compensation schemes and performance Analysis of IQ Imbalances in Direct Conversion Receivers. In Proceedings of the 2009 International Conference on Signals, Systems and Automation (ICSSA 2009). Universal-Publishers.

196. Pise A., Nale D. Web Based – Application for Result Analysis, Communications in Computer and Information Science 2439 CCIS 2025, Scopus Indexed

197. Prof. A. C. Pise, Namrata Dabade, Sumitra Deshmane, Puja Gavade, AI Maze Escape Game Using Minmax Algorithm, International Journal of Advanced Research in Science, Communication and Technology, Volume 5, Issue 4, October 2025, ISSN: 2581-9429. [10.48175/IJARSCT-29506](https://doi.org/10.48175/IJARSCT-29506)

198. Prof. Anjali Pise, Mr. Omkar Kumbhar, Mr. Sujal Mane, Mr. Ruturaj Patil, AI ChatBot Using Python, International Journal of Advanced Research in Science, Communication and Technology, Volume 5, Issue 4, October 2025, ISSN: 2581-9429. [10.48175/IJARSCT-29509](https://doi.org/10.48175/IJARSCT-29509)

199. Prof. Anjali Pise, Mr. Omkar Kumbhar, Mr. Sujal Mane, Mr. Ruturaj Patil, AI ChatBot Using Python – A Systematic Review, International Journal of Advanced Research in Science, Communication and Technology, Volume 5, Issue 4, October 2025, ISSN: 2581-9429.

200. Niharika Bodake, Akshata Gaurkar, Vaishnavi Chavan, Vaishnavi Bhosale, Prof. A. C.



Pise, A Review on IoT Based Solid Waste Management System, International Journal of Advanced Research in Science, Communication and Technology, Volume 5, Issue 4, October 2025, ISSN: 2581-9429. [10.48175/IJARSCT-29434](https://doi.org/10.48175/IJARSCT-29434).

201. Prof. A. C. Pise, Namrata Dabade, Sumitra Deshmane, Puja Gavade, Smart Wheelchair, International Journal of Advanced Research in Science, Communication and Technology, Volume 5, Issue 4, October 2025, ISSN: 2581-9429. [10.48175/IJARSCT-29437](https://doi.org/10.48175/IJARSCT-29437).

202. Sanket Badave, Prajwal Bhujbal, Aaditya Aradhya, Vishant Bagewadikar, A. C. Pise (2025), “Drowsiness Detection System”, International Journal of Advanced Research in Science, Communication and Technology, Volume 5, Issue 4, October 2025, ISSN: 2581-9429. [10.48175/IJARSCT-29405](https://doi.org/10.48175/IJARSCT-29405)

203. Prof. A. C. Pise, Namrata Dabade, Sumitra Deshmane, Puja Gavade, AI Maze Escape Game Using Minmax Algorithm, International Journal of Advanced Research in Science, Communication and Technology, Volume 5, Issue 4, October 2025, ISSN: 2581-9429. [10.48175/IJARSCT-29505](https://doi.org/10.48175/IJARSCT-29505)

204. Niharika Bodake, Akshata Gaurkar, Vaishnavi Chavan, Vaishnavi Bhosale, Prof. A. C. Pise, IoT Based Solid Waste Management System, International Journal of Advanced Research in Science, Communication and Technology, Volume 5, Issue 4, October 2025, ISSN: 2581-9429. [10.48175/IJARSCT-29415](https://doi.org/10.48175/IJARSCT-29415)

205. Prof. A. C. Pise, Namrata Dabade, Sumitra Deshmane, Puja Gavade, Smart Wheelchair with Automated Breaking and GPS, International Journal of Advanced Research in Science, Communication and Technology, Volume 5, Issue 4, October 2025, ISSN: 2581-9429. [10.48175/IJARSCT-29435](https://doi.org/10.48175/IJARSCT-29435)

206. Sanket Badave, Prajwal Bhujbal, Aaditya Aradhya, Vishant Bagewadikar, A. C. Pise (2025), A Review on Driver Drowsiness Detection Systems Using Image Processing and AI Techniques, International Journal of Advanced Research in Science, Communication and Technology, Volume 5, Issue 4, October 2025, ISSN: 2581-9429. [10.48175/IJARSCT-29403](https://doi.org/10.48175/IJARSCT-29403).

207. A. C. Pise, Raut S., Smart Vehicle: A Systematic Review, International Journal of Research Publication and Reviews, ISSN 2582-7421, Vol 4, no 10, pp 2728-2731 October 2023.

208. Sonali P. Raut, & A. C. Pise. (2023). Smart Vehicle. Journal of Electronics, Computer Networking and Applied Mathematics, 4(01), 38–47. <https://doi.org/10.55529/jecnam.41.38.47>

209. Pise, A. C. IoT Based Landmine Detection Robot. International Journal of Research in Science & Engineering ISSN: 2394-8299 Vol: 03, No. 04, June-July 2023.

210. Jayshri Prakash Patale, A. B. Jagadale, A. O. Mulani, & Anjali Pise (2022). A Systematic survey on Estimation of Electrical Vehicle. Journal of Electronics, Computer Networking and Applied Mathematics, (JECNAM) ISSN, 2799-1156. 3(01), 1–6. <https://doi.org/10.55529/jecnam.31.1.6>



211. Pise, A. C. (2022). An IoT Based Real Time Monitoring of Agricultural and Micro irrigation system. International journal of scientific research in Engineering and management (IJSREM), VOLUME: 06 ISSUE: 04 | APRIL – 2022, ISSN: 2582-3930, 6(04).
212. Harale, A. D., & Karande, K. J. (2026). Gabor-Augmented Two-Stream Framework With GoogLeNet-Based Temporal Attention for Semantic Dynamic Hand Gesture Recognition. Computer Animation and Virtual Worlds 37 (3), e70118.
213. Gadade, B., Mulani, A. O., & Harale, A. D. (2024). Iot based smart school bus and student monitoring system. Naturalista Campano 28 (1), 730-737.
214. Gadade, B., Mulani, A. O., & Harale, A. D. (2024). IoT Based Smart School Bus and Student Tracking System. IoT Based Smart School Bus and Student Tracking System.
215. Kolekar, S. D., Walekar, V. B., Patil, P. S., Mulani, A. O., & Harale, A. D. (2022). Password Based Door Lock System. Int. J. of Aquatic Science 13 (1), 494-501.
216. Avinash D. Harale and Kailash J. Karande , “Literature review on Dynamic Hand Gesture Recognition”,AIP Conference Proceeding ,31st Oct 2022, <https://doi.org/10.1063/5.0107577>
217. A. D. Harale and K. J. Karande, “Gabor-Augmented Two-Stream Framework With GoogLeNet-Based Temporal Attention for Semantic Dynamic Hand Gesture Recognition,” Computer Animation and Virtual Worlds 37, no. 3 (2026): e70118, <https://doi.org/10.1002/cav.70118>.
218. A. D. Harale , Amruta S. Bankar and K. J. Karande, “Gestures Controlled Home Automation using Deep Learning: A Review”, International Journal of Current Engineering and Technology, Vol.11, No.6.page no-617-621, Dec 2021
219. D. Harale, Ms. Asma Hakim, Dr.K.J.Karande, “Hand gesture identification system for hearing and speech impairment”, TELEMATIQUE, Volume 23 Issue 1, 2024 page n- 497–501, April 2024
220. A.D. Harale, Atik N. Pathan and A. O. Mulani, “Hand Gesture Controlled Robotic System” International Journal of Aquatic Science, ISSN: 2008-8019 Vol 13, Issue 01, Jan 2022
221. D. Harale, K. J. Karande, Sagar S. Bhumkar, “Wireless Hand Geture Control Robot with Object Detection”, Journal of Image Processing and Intelligent Remote Sensing, ISSN 2815-0953, Vol. 3 No. 04 (2023), July 2023.
222. A.D.Harale, Ms.Asma Hakim, Altaf Mulani, K.J.Karande, “Implementation of Human Gesture Recognition Using CNN”, June 2024 ,Journal of STM.
223. Dheeraj Muttin and Avinash Harale, “IoT Based Personal Medical Assistant System”, “International Journal of Innovative Research in Technology (IJIRT)”, Volume 8 Issue 5 | ISSN: 2349-6002, October 2021.
224. Vijay Waghmode and Avinash Harale, “Development of Alphanumeric Digital Fuel Gauge for Automotive Applications”, “International Conference on Communication and Signal



Processing”, IEEE, April 4-6, 2019.

225. Gorakhnath U. Waghmode and Avinash D. Harale, “A Cloud Computing Based WSNs for Agriculture Management”, Springer International Publishing, Conference: Techno-Societal DOI 10.1007/978-3-319-53556-2_107 December 2018.

226. Sanaha S. Path and Avinash D. Harale, “Silkworm Eggs Counting System Using Image Processing Algorithm”, Springer International Publishing, Conference: Techno-Societal DOI:10.1007/978-3-319-53556-2_32_ December 2018.

227. S. S. Kulkarni and A.D.Harale, “Image Processing for Driver’s Safety and Vehicle Control using Raspberry Pi and Webcam”, “IEEE International Conference on Power, Control, Signals and Instrumentation Engineering (ICPCSI)-IEEE, 2017.

228. Supriya A Salunke and Avinash D Harale, “Vehicle Tracking System for School Bus by Arduino”, International Research Journal of Engineering and Technology (IRJET), ISSN: 2395-0072, Volume: 04 Issue: 03, Mar -2017.

229. Bhakti B.Bhaganagare Avinash.D.Harale, “Iris as Biometrics for Security System”, 2nd International Conference on Electrical, Computer and Communication Technologies, IEEE, 2017.

230. Supriya A Salunke and Avinash D Harale, “Vehicle Tracking System Using GPRS For School Bus”, International Journal of Engineering Research in Electrical and Electronic Engineering (IJEREEE), ISSN-2395-2717, Vol 3, Issue 1, January 2017.

231. Sanaha S. Pathan and Avinash D. Harale, “Automated silkworm eggs count”, IEEE International Conference on Advances in Electronics, Communication and Computer Technology (ICAECCT)”, Rajarshi Shahu College of Engineering, Pune India. Dec 2-3, 2016.

232. Sanaha S. Pathan and Avinash D. Harale, “Silkworm Egg Counting System Using Image Processing Algorithm -A Review”, International Research Journal of Engineering and Technology (IRJET) Volume: 03 Issue: 06, ISSN: 2395-0072, June-2016.

233. Gorakhnath U.Waghmode and Avinash D.Harale , “A survey on: Cloud Enabled Agricultural Management”, International Journal of Research (IJR), e-ISSN: 2348-6848, p- ISSN: 2348-795X Volume 2, Issue 09, September 2015.

234. Mrunmayee V. Daithankar, Kailash J. Karande and Avinash D. Harale, “Analysis of Skin Color Models for Face Detection”, International Conference on Communication and Signal Processing, IEEE April 3-5, 2014.

235. Apurva Sutar, K. J. Karande and A. D. Harale, “Deep Learning based Automated Billing Cart”, International Journal of Advanced Research in Science, Communication and Technology (IJARSCT), ISSN (Online) 2581-9429, Volume 3, Issue 4, April 2023.

236. Apurva Sutar, K. J. Karande and A. D. Harale , “Deep Learning Based Smart Billing Cart Using RFID and Yolo”, Purakala, ISSN: 0971-2143, Vol 32 Issue 1, 2023.

237. Yogesh Jadhav, Kakade Vishal, Virendra Metkari, Siddheshwar S. Gangonda, “IOT Based



Greenhouse Monitoring and Controlling System”, IJSRD - International Journal for Scientific Research & Development| Vol. 12, Issue 3, 2024 | ISSN (online): 2321-0613.

238. Akash Lawande, Kishor Mane, Kunal Davad, Siddheshwar S. Gangonda, “Pipeline Survey Robot”, IJSRD - International Journal for Scientific Research & Development| Vol. 12, Issue 3, 2024 | ISSN (online): 2321-0613.

239. Siddheshwar S. Gangonda, Prashant P. Patavardhan, Kailash J. Karande, “VGHN: variations aware geometric moments and histogram features normalization for robust uncontrolled face recognition”, International Journal of Information Technology, <https://doi.org/10.1007/s41870-021-00703-0>.

240. Siddheshwar Gangonda and Prachi Mukherji, “Speech Processing for Marathi Numeral Recognition using MFCC & DTW Features”, International Journal of Engineering Research and Applications (IJERA) pp. 118-122, ISSN: 2248- 9622.

241. Siddheshwar S. Gangonda, Prashant P. Patavardhan, Kailash J. Karande, “Recognition of Marathi Numerals using MFCC and DTW Features”, 2nd International Conference on Recent Trends in Image Processing and Pattern Recognition (RTIP2R 2018), 21th -22th Dec., 2018, organized by Solapur University, Solapur in collaboration with University of South Dakota (USA) and Universidade de Evora (Portugal), India.

242. Siddheshwar S. Gangonda, Prashant P. Patavardhan, Kailash J. Karande, “A Comprehensive Survey of Face Databases for Constrained and Unconstrained Environments”, 2nd IEEE Global Conference on Wireless Computing & Networking (GCWCN-2018), 23th-24th Nov. 2018, organized by STES's Sinhgad Institute of Technology, Lonavala, India.

243. Siddheshwar Gangonda and Prachi Mukherji, “Speech Processing for Marathi Numeral Recognition”, ePGCON 2011, 26th April 2011 organized by MAEER's MIT, Kothrud, Pune-38.

244. Siddheshwar Gangonda, “Medical Image Processing”, Aavishkar-2K7, 17th and 18th March 2007 organized by Department of Electronics and Telecommunication Engineering, SVERI's COE, Pandharpur.

245. Bhaganagare, S., Chavan, S., Gavali, S., & Godase, V. (2025). The vocal cortex of the smart home: A review of esp32-based control and automation architectures. International Journal of Advanced Research in Science, Communication and Technology, 1071-1094.

246. Bhaganagare, S., Chavan, S., Gavali, S., & Godase, V. V. (2025). Voice-controlled home automation with esp32: A systematic review of IoT-based solutions. Journal of Microprocessor and Microcontroller Research, 2(3), 1-13.

247. Dange, R., Attar, E., Ghodake, P., & Godase, V. (2023). Smart agriculture automation using ESP8266 NodeMCU. J. Electron. Comput. Netw. Appl. Math,(35), 1-9.

248. Dhope, V., Chavan, A., Hadmode, N., & Godase, V. (2024). Smart plant monitoring system. International Journal of Creative Research Thoughts (IJCRT). <https://www.ijcrt.org>.



249. Ghadage, I., Ghadge, P., Kamble, R., Mhamane, R., & Godase, V. V. (2025). Development of a cloud-connected industrial temperature and humidity monitoring system. *Development*, 5(4).
250. Ghadage, I., Ghadge, P., Kamble, R., Mhamane, R., & Godase, V. V. (n.d.). Industrial environment monitoring using IoT: A comprehensive review on temperature and humidity control
251. Godase, V., & Jagadale, A. (2019). Three element control using PLC, PID & SCADA interface. *International Journal for Scientific Research and Development*, 7(2), 1105-1109.
252. Godase, V. (2023). Smart agriculture automation using ESP8266 node MCU. *Journal of Electronics, Computer Networking and Applied Mathematics (JECNAM)* ISSN, 2799(1156), 1.
253. Godase, V., Mulani, A., Ghodak, R., Birajadar, G., Takale, S., & Kolte, M. (2024). A MapReduce and kalman filter based secure IIoT environment in hadoop. *Sanshodhak*, 25, 38-47.
254. Godase, V., Pawar, P., Nagane, S., & Kumbhar, S. (2024). Automatic railway horn system using node MCU. *Journal of Control & Instrumentation*, 15(1).
255. Godase, V., & Godase, J. (2024). Diet prediction and feature importance of gut microbiome using machine learning. *Evolution in Electrical and Electronic Engineering*, 5(2), 214-219.
256. Godase, V., Jadhav, Y., & Kakade, V. (2024). IOT based greenhouse monitoring and controlling system. *International Journal for Scientific Research & Development*, 12(3), 138-140.
257. Godase, V. (2025). A comprehensive review on PIR sensor-based light automation systems. *International Journal of Image Processing and Smart Sensors*, 1(1), 22-29.
258. Godase, V. (2025). A comprehensive review on scalable Arduino radar platform for real-time object detection and mapping. *Journal of Microprocessor and Microcontroller Research e-ISSN*, 3048-6637.
259. Godase, V. (2025). A comprehensive study of revolutionizing EV charging with solar-powered wireless solutions. *Advance Research in Power Electronics and Devices e-ISSN*, 3048-7145.
260. Godase, V., Khiste, R., & Palimkar, V. (2025). Ai-optimized reconfigurable antennas for 6G communication systems. *Journal of RF and Microwave Communication Technologies*, 2(3), 1-12.
261. Godase, V. V. (2025). Artificial intelligence and human society: A double-edged sword. *Impact of Artificial intelligence On Society*.
262. Godase, V. (2025). Automated water distribution management and leakage mitigation using PLC systems. *Journal of Control and Instrumentation Engineering*.
263. Godase, V., Altaf Mulani, S. T., Ghodake, R., & Birajadar, G. (2025). Blockchain for transparent irrigation water allocation and management. *Int. Water Irrig*, 44, 518-521.
264. Godase, V. (2025). Case study: Combating adversarial attacks in AI systems. *Artificial Intelligence Education And Innovation*.



265. Godase, V. (2025). Comparative study of ladder logic and structured text programming for PLC. Available at SSRN.
266. Godase, V. (2025). Comprehensive review on explainable ai to addresses the black box challenge and its role in trustworthy systems. Sinhgad College of Engineering, Artificial Intelligence Education and Innovation, 127-132.
267. Godase, V. (2025). Cross-domain comparative analysis of microwave imaging systems for medical diagnostics and industrial testing. Journal of Microwave Engineering & Technologies, 12(2), 39-48.
268. Godase, V. (2025). Design and optimization of reconfigurable microwave filters using AI techniques. Journal of RF and Microwave Communication Technologies, 2(2), 26-41.
269. Godase, V. V. (2025). Digital governance and the right to information in india: Pathways to transparency. Available at SSRN 5817082.
270. Godase, V. (2025). Edge AI for smart surveillance: Real-time human activity recognition on low-power devices. International Journal of AI and Machine Learning Innovations in Electronics and Communication Technology, 1(1), 29-46.
271. Godase, V. V. (2025). Education as empowerment: The key to women's socio-economic development. Available at SSRN 5536520.
272. Godase, V. V. (2025). Fra-polar net: A novel image processing framework for transformer condition monitoring. Recent Trends in Semiconductor and Sensor Technology, 2(3), 11-24.
273. Godase, V. (2025). Graphene-based nano-antennas for terahertz communication (source details not available on Scholar profile).
274. Godase, V. (2025). IoT-MCU integrated framework for field pond surveillance and water resource optimization. International Journal of Emerging IoT Technologies in Smart Electronics and Communication.
275. Godase, V. (2025). LoRaEdge-ESP32 synergy: Revolutionizing farm weather data collection with low-power, long-range IoT. Advance Research in Analog and Digital Communications.
276. Godase, V. (2025). Navigating the digital battlefield: An in-depth analysis of cyber-attacks and cybercrime. International Journal of Data Science, Bioinformatics and Cyber Security, 1(1), 16-27.
277. Godase, V. (2025). Optimized algorithm for face recognition using deep face and multi-task cascaded convolutional network (MTCNN). Optimum Science Journal, 66-74.
278. Godase, V., Khiste, R., & Palimkar, V. (2025). Programmable smart surfaces and intelligent reflecting surfaces for enhanced wireless propagation in indoor and outdoor environments. International Journal of Satellite-Based Communication and Wireless Networks System, 1(2), 29-41.



279. Godase, V., Modi, S., Misal, V., & Kulkarni, S. (2025). Real-time object detection for autonomous drone navigation using yolov8. *Advance Research in Communication Engineering and its Innovations*, 2(2), 17-27.
280. Godase, V. (2025). Smart energy management in manufacturing plants using PLC and SCADA. *Advance Research in Power Electronics and Devices*, 2(2), 14-24.
281. Godase, V. V. (2025). Vlsi-integrated energy harvesting architectures for battery-free IoT edge systems. *Journal of Electronics Design and Technology*, 2(3), 1-12.
282. Godase, V. (2025). Voice controlled home automation using ESP32 and IoT-Based cloud integration. *International Journal of Advanced Research in Science, Communication and Technology*.
283. Godase, V., Pandhare, A., & Pandhare, S. (2026). Mechanical and thermal characterization of natural fiber-reinforced epoxy composites for structural applications. *International Journal of Composite Materials and Matrices*, 12(1), 37-48p.
284. Hipparkar, J., Mulani, A., Godase, V., Takale, S., & Ghodake, R. (2026). Real-time vision-based disease detection using edge-optimized deep learning models. In *2026 IEEE International Conference on Emerging Computing and Intelligent Technologies (ICoECIT)* (pp. 1-5). IEEE.
285. Jamadade, V. K., Ghodke, M. G., Katakdhond, S. S., & Godase, V. (2025). A review on real-time substation feeder power line monitoring and auditing systems,”. *International Journal of Emerging IoT Technologies in Smart Electronics and Communication*, 1(2), 1-16.
286. Jamadade, V., Ghodake, M., Katakdhond, S., & Godase, V. (n.d.). A comprehensive review of real-time feeder monitoring and auditing systems: Architectures, technologies, and analytics for the smart grid (source details not available on Scholar profile).
287. Jamadade, V., Ghodake, M., Katakdhond, S., & Godase, V. (n.d.). A review on ai-powered image generation system using AI
288. Kumbhar, B., Kokelar, S., Rohidas, K., & Jadhav, S. (n.d.). An overview of real-time bus tracking in smart bus stop system (source details not available on Scholar profile).
289. Nagane, S. K., Pawar, P. S., & Godase, V. V. (2022). Cinematica sentiment analysis. *Journal of Image Processing and Intelligent Remote Sensing*, 2(3), 27-32.
290. Vaibhav, V. G. (2025). A neuromorphic-inspired, low-power VLSI architecture for edge AI in IoT sensor nodes. *Journal of Microelectronics and Solid-State Devices*, 12(2), 41-47.
291. Godase, M. V., Mulani, A., Ghodak, M. R., Birajadar, M. G., Takale, M. S., & Kolte, M. (2024). A MapReduce and Kalman filter based secure IIoT environment in Hadoop. *Sanshodhak*, 25, 38–47.
292. A.H.Shinde, V. V. Sardar, S. M. Ubale, and S. M. Moholkar, “IoT-Based Prepaid Energy Meter with Stealing Alert,” in *Proceedings of the 6th International Conference on Recent Trends in ...*, vol. 1737, 2026, DOI: 10.1007/978-981-95-5082-1_12.



293. K. G. Landage, V. B. Manepatil, R. R. Mokashi, and A. H. Shinde, "IoT Based Smart Electricity Energy Meter," *International Journal of Progressive Research in Engineering Management and Science (IJPREMS)*, vol. 05, no. 03, pp. 1298–1302, Mar. 2025.
294. V. Dhage, A. Nagane, R. Menkudale, and A. H. Shinde, "The Evolution of Student Monitoring Systems in School Buses: A Detailed Review," *International Journal of Electrical Machine Analysis and Design (IJEMAD)*, vol. 2, no. 1, Jan.–Jun. 2024, DOI: 10.37591/IJEMAD.
295. S. Pandhare, S. Mali, K. Sahani, and A. H. Shinde, "Sentiment Analysis Based on Movie Review," *International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)*, vol. 5, no. 4, Oct. 2025, DOI: 10.48175/IJARSCT-29496.
296. S. Pandhare, S. Mali, K. Sahani, and A. H. Shinde, "A Systematic Review – Sentiment Analysis Based on Movie Review," *International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)*, vol. 5, no. 4, Oct. 2025, DOI: 10.48175/IJARSCT-29495.
297. P. Devram, A. Pise, G. Tanwade, and A. H. Shinde, "A Review on Voice Assistant," *International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)*, vol. 5, no. 4, Oct. 2025, DOI: 10.48175/IJARSCT-29487.
298. P. Devram, A. Pise, G. Tanwade, and A. H. Shinde, "Voice Assistant," *International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)*, vol. 5, no. 4, Oct. 2025, DOI: 10.48175/IJARSCT-29488.
299. P. Devram, A. Pise, G. Tanwade, and A. H. Shinde, "Literature Review on Smart Door Lock Using Keypad & GSM," *International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)*, vol. 5, no. 4, Oct. 2025, DOI: 10.48175/IJARSCT-29452.
300. P. Devram, A. Pise, G. Tanwade, and A. H. Shinde, "Smart Door Lock Using Keypad & GSM," *International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)*, vol. 5, no. 4, Oct. 2025, DOI: 10.48175/IJARSCT-29438.
301. Shubham Salunkhe, Pruthviraj Zambare, Sakshi Shinde, S. K. Godase. (2024). API Development for Cloud Parameter Curation International. *Journal of Electrical and Communication Engineering Technology*, 2(1). <https://doi.org/10.37591/ijecet>
302. Badave, A., Pawale, A., Andhale, T., Godase, S. K., & STM JOURNALS. (2024). Smart home safety using fire and gas detection system. *Recent Trends in Fluid Mechanics*, 1, 35–43. <https://journals.stmjournals.com/rtfm>
303. Asabe, H., Asabe, R., Lengare, O., & Godase, S. (2025). IOT- BASED STORAGE SYSTEM FOR MANAGING VOLATILE MEDICAL RESOURCES IN HEALTHCARE FACILITIES. *INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN*



ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS), 05(03), 2427–2433.
<https://www.ijprems.com>

304. Karche, S. N., Mulani, A. O., Department of Electronics, SKN Sinhgad College of Engineering, Korti, & University of Solapur, Maharashtra, India. (2018). AESC Technique for Scalable Face Image Retrieval. International Journal of Innovative Research in Computer and Communication Engineering, 6(4), 3404–3405.
<https://doi.org/10.15680/IJIRCCE.2018.0604036>
305. Obstacle avoidance and Bluetooth control car. (2025). In International Journal of Advanced Research in Science, Communication and Technology (Vol. 5, Issue 4) [Journal-article]. <https://www.ijarsct.co.in>
306. Ultrasonic and arduino based radar system. (2025). In International Journal of Advanced Research in Science, Communication and Technology (Vol. 5, Issue 4) [Journal-article]. <https://www.ijarsct.co.in>
307. Shitole, M., Thokale, S., Patil, N., Shingare, S., & Godase, S. K. (2025). Review on Ultrasonic Sensor-Based RADAR Systems for object detection and distance Measurement. International Journal of Advanced Research in Science Communication and Technology, 392–408. <https://doi.org/10.48175/ijarsct-29424>
308. Chavan, R., Chavan, S., Gaikwad, O., Gaikwad, K., & Godase, S. K. (2025). Review of smart robotic car systems for obstacle detection and Bluetooth Control. International Journal of Advanced Research in Science Communication and Technology, 521–536. <https://doi.org/10.48175/ijarsct-29432>
309. Patil, S., Navale, P., Suryawanshi, V., & Godase, S. K. (2025). Advance solar tracking and automatic sprinkler irrigation system. In SKN Sinhgad College of Engineering, International Journal of Advanced Research in Science, Communication and Technology (Vol. 5, Issue 4) [Journal-article]. <https://www.ijarsct.co.in>
310. Navale, P., Patil, S., Suryawanshi, V., & Prof. S. K. Godase. (2025). Smart Solar-Irrigo System. In International Journal of Advanced Research in Science, Communication and Technology (Vol. 5, Issue 4) [Journal-article]. <https://www.ijarsct.co.in>
311. A Systematic Review- Sugarcane disease prediction. (2025). In International Journal of Advanced Research in Science, Communication and Technology (Vol. 5, Issue 4) [Journal-article]. <https://www.ijarsct.co.in>
312. Zade, M. M., & Mukane, D. S. (2013). Enhancement of image with the help of switching median filter. In National Conference on Emerging Trends in Electronics & Telecommunication.
313. Zade, M. M., Rupanar, B. B., Shilawant, V. S., & Pawar, A. R. (2025). IOT flood monitoring & alerting system using Raspberry Pi-Pico. International Journal of Research Publication & Reviews, 6(3).



314. Zade, M. M. (2019). Performance analysis of PSNR vs. impulse noise for the enhancement of image using SMF. In National Conference on Mathematical Modeling and Computational Intelligence.
315. Zade, M. M. (2019). Dynamic clustering of wireless sensor network using modified AODV. In National Conference on Mathematical Modeling and Computational Intelligence.
316. Zade, M. M. (2019). Classification of power quality disturbances using SVM & their efficiency comparison. In National Conference on Mathematical Modeling and Computational Intelligence.
317. Zade, M. M. (2016). Performance analysis of median filter for enhancement of highly corrupted images. In National Conference on Advanced Trends in Engineering.
318. Zade, M. M. (2016). Implementation of Reed Solomon encoder & decoder using FPGA. In National Conference on Advanced Trends in Engineering.
319. Zade, M. M. (2016). Performance of switching median filter for enhancement of image. In National Conference on Mechatronics at Sinhgad Institute of Technology.
320. Zade, M. M., Kambale, S. D., Mane, S. A., & Jadhav, P. M. (2025). IOT based early fire detection in jungles. RIGJA&AR, 2(1).
321. Zade, M. R. (2017). Finite element analysis and fatigue analysis of crane hook with different materials. International Research Journal of Engineering and Technology, 4(01).
322. Bansude, V. U., Togrikar, P. S., Karve, S. M., & Zade, M. M. (n.d.). A hybrid model for early PCSO detection using VGG16 CNN and XGBoost on multimodal data. Journal of Technical Education, 342.
323. Mahadev, M., Rahulkumar, D. R., & Shirkande, D. (n.d.). Efficient routing and data fusion in IoT-WSNs for resilient forest fire monitoring.
324. Mr. Zade Mahesh Mahadev published a paper in International Journal of Artificial Intelligence and Machine Learning on “An Iot-Enabled Resilient Wireless Sensor Network Framework For Early Forest Fire Detection And Monitoring” June 2026(SCOPUS)
325. Mr. Zade Mahesh Mahadev published a paper in International Journal of Artificial Intelligence and Machine Learning on “A Reliable, Energy-Efficient And Secure Data Aggregation Framework For Resource Constrained Wireless Sensor Networks” June 2026(SCOPUS)
326. Mr. Zade Mahesh Mahadev published a paper in Shodhkosh-Journal of Visual & Performing Arts on “Visualizing Forest Fire Risks: An Efficient and Resilient IoT-Enabled Wireless Sensor Network Approach” March 2026
327. Mr. Zade Mahesh Mahadev published a paper in Shodhkosh-Journal of Visual & Performing Arts on “The Aesthetics of Data Flow: Enhancing Reliability and Efficiency in Resource-Constrained Wireless Sensor Networks” March 2026



328. Mr. Zade Mahesh Mahadev published a paper in Anveshana's International Journal of Research in Engineering and Applied Sciences on "EFFICIENT ROUTING AND DATA FUSION IN IOT-WSNS FOR RESILIENT FOREST FIRE MONITORING" AIJREAS VOLUME 10, ISSUE 9 (2025, SEP) (ISSN-2455-6300) ONLINE
329. Mr.M.M.Zade Presented the Paper on "Touchless Fingerprint Recognition System" (Paper-ID 907) in International Conference on "Advanced Technologies for Societal Applications: Techno-Societal 2022 organized by Shri Vithal Education & Research Institute(SVERI), Pandharpur from 9th December 2022 to 10th December 2022.
330. Mr. Mahesh M Zade, "Performance analysis of PSNR Vs. Impulse Noise for the enhancement of Image using SMF", Journal of Applied Science & Computations (JASC UGC Approved), Volume VI, Issue II, Feb.2019
331. Mr. Mahesh M Zade, "Classification of Power Quality Disturbances Using SVM & their Efficiency Comparison", Journal of Applied Science & Computations (JASC UGC Approved), Volume VI, Issue II, Feb.2019
332. Mr. Mahesh M Zade, "Dynamic Clustering of Wireless Sensor Network Using Modified AODV", Journal of Applied Science & Computations (JASC UGC Approved), Volume VI, Issue II, Feb.2019
333. Mr. Mahesh M Zade, "Performance analysis of PSNR Vs. Impulse Noise for the enhancement of Image using SMF", National Conference on Mathematical Modeling and Computational Intelligence 2K19 (MMCI-2k19), in association with JASC, at S. B. Patil College of Engineering, Indapur, Feb.2019
334. Mr. Mahesh M Zade, "Classification of Power Quality Disturbances Using SVM & their Efficiency Comparison", National Conference on Mathematical Modeling and Computational Intelligence 2K19 (MMCI-2k19), in association with JASC, at S. B. Patil College of Engineering, Indapur Feb.2019
335. Mr. Mahesh M Zade, "Dynamic Clustering of Wireless Sensor Network Using Modified AODV", National Conference on Mathematical Modeling and Computational Intelligence 2K19 (MMCI-2k19), in association with JASC, at S. B. Patil College of Engineering, Indapur Feb.2019
336. Mr.Mahesh M Zade & Dr.S.M.Mukane,"Enhancement of Image with the help of Switching Median Filter", International Journal of Computer Application (IJCA) SVERI's College of Engineering, Pandharpur, Dec.2013.
337. Ghadage, A., Gholave, C., Devkar, A., & Naiknavare, M. V. (2025). Email spam detection with machine learning. *International Journal of Advanced Research in Science, Communication and Technology*.
338. Naiknavare, M. V. (2024). Innovative approaches in greenhouse technology: A critical analysis of spectral data for enhanced plant growth monitoring. *International Journal*



- of *Creative Research Thoughts*, 12(5).
339. Rao, P. V. K. J., Madhava, M., Sreedevi, P., Kiranmayi, K., & Lakshmi, M. B. (2023). Optimisation of process parameters for centrifugal clarification of sugarcane juice for quality jaggery. *Journal of Agricultural Engineering (India)*, 60(3), 261–271.
340. Ghadage, A., Gholave, C., Devkar, A., & Naiknavare, M. V. (n.d.). Smart poultry farming with ESP8266: A comprehensive review of monitoring and automation approaches.
341. Khedekar, S., Jadhav, R., Pawar, S., & Naiknavare, M. V. (n.d.). Simplifying travel planning with AI-powered chatbot assistance.
342. Advancements in Real-Time Crack Detection Techniques for Structural Health Monitoring International Journal of Advanced Research in Science, Communication and Technology, International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal, Volume 5, Issue 4, October 2025
343. Intelligent Monitoring of Civil Infrastructure Health Tushar Ghadage, Amit Pandhare, Aaditya Metkari, Prof. V. B. Utpat International Journal of Advanced Research in Science, Communication and Technology International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal Volume 5, Issue 4, October 2025
344. A Comprehensive Review on IoT-Based Smart Energy Meter with Real-Time Monitoring and Automated Billing System Shubham Tathe¹, Abhishek Savalgi², Amit Thombare³, Ganesh Sarak⁴, Ms. V. B. Utpat⁵, Dr. S. V. Pingale⁶ International Journal of Advanced Research in Science, Communication and Technology International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal Volume 5, Issue 4, October 2025
345. Digital Timetable Automation System Anurag Pawar¹, Prathamesh Aradhya², Akash katte³, Prof. Utpat V. B. International Journal of Advanced Research in Science, Communication and Technology International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
346. Automatic Waste Segregation Mayank Kulkarni¹, Sudesh Godase², Digvijay Khilare³, Prof. V. B. Utpat Advanced Research in Science, Communication and Technology International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal