

Digital Timetable Automation System

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Abstract: Any educational institution must have an effective schedule management system to guarantee that staff and students can easily obtain the most recent information about classes. Static notice boards and traditional paper-based timetables are frequently rigid, prone to update delays, and require manual intervention, all of which might cause misunderstandings or miscommunications.

In order to visualise class schedules in real time, this project presents a Digital Timetable System that is driven by an Arduino microcontroller and a TFT display. Authorised staff members can easily amend timetable entries in the central database by using the web-based interface that the system incorporates. The Arduino displays the matching schedule on the TFT screen after receiving the current lecture details from the database via a Python software that runs with the system clock.

This configuration offers a dependable, automatic, and dynamic method of managing schedules.

Improving timeline dissemination's accuracy, efficiency, and accessibility is the main goal of this project.

The technology minimises human labour while guaranteeing that students always have access to the most recent information by automating the updating process and doing away with the necessity for manual display adjustments. The solution is a workable substitute for conventional techniques since it is affordable, easy to use, and flexible enough to accommodate various institutional needs.

Keywords: Digital timetable, Arduino, TFT display, Web interface, Automated scheduling

I. INTRODUCTION

Time management and efficient schedule communication are essential components of academic institutions, ensuring that both students and faculty can organize their activities without confusion. A timetable serves as the backbone of academic planning, guiding classroom utilization, subject allocation, and faculty responsibilities. Traditionally, institutions depend on printed charts, static notice boards, or verbally conveyed updates to display class schedules. While these approaches are straightforward, they are often inconvenient and lack flexibility. Any sudden rescheduling of lectures, substitutions due to faculty unavailability, or adjustments for special events require manual updates, which are time-consuming and sometimes fail to reach all students in a timely manner. This delay can lead to miscommunication, wasted time, and reduced efficiency in the academic environment.

With the increasing digitalization of education, there is a growing expectation for smarter solutions that can deliver real-time updates in a more accessible and automated manner. Although certain digital notice boards and commercial timetable management platforms exist, they typically rely on expensive infrastructures, cloud subscriptions, or advanced IoT-based systems, which may not always be affordable or practical for small and medium-scale institutions. Furthermore, many existing solutions still require repeated manual intervention and technical expertise, limiting their adoption in resource-constrained environments. These limitations highlight the need for a more cost-effective, scalable, and user-friendly system that combines embedded hardware with simple digital interfaces to provide dynamic scheduling updates.

To address these challenges, this project proposes a Digital Timetable System that leverages Arduino microcontroller technology integrated with a TFT display to present current class schedules dynamically. The system introduces a web-based interface through which authorized staff members can conveniently alter timetable data stored in a central database. A Python program, synchronized with the system clock, retrieves the current lecture details from the database at regular



intervals and communicates them to the Arduino. The Arduino processes this input and displays the relevant information on the TFT screen, ensuring that the timetable remains up-to-date at all times without the need for manual replacement of physical charts. This workflow establishes an automated and reliable bridge between staff inputs and student-facing displays.

The proposed system offers several advantages. It eliminates the dependence on static paperbased timetables, reduces the human effort required for continuous updates, and enhances accessibility by ensuring that students are always presented with the most recent schedule. Its design emphasizes affordability and ease of use, making it practical for institutions of varying scales. Moreover, the system provides a foundation for future improvements, such as wireless data transmission, integration with multiple display units across different classrooms, or the addition of notifications sent directly to students' mobile devices.

By automating timetable management, the project significantly improves communication within educational institutions and supports smoother academic operations. The rest of this paper is organized as follows: the next section reviews related work and existing timetable solutions, followed by details of the methodology and system design. The subsequent section presents experimental results and system evaluation, and finally, the conclusion summarizes the project's contributions and outlines possible directions for future development.

II. LITERATURE SURVEY

Park.s et al. [1] (2025) introduced an Arduino-based digital notice board using GSM technology, enabling institutions to send updates via SMS directly to an LCD display.

Kumar et al. [2] (2025) developed a Wi-Fi-enabled electronic notice board system using ESP8266, focusing on wireless updates and reducing manual intervention. Sharma et al. [3] (2025) designed a smart timetable management application that integrates web-based scheduling with IoT-based displays, highlighting real-time dissemination of lecture schedules. Singh et al. [4] (2025) implemented a low-cost embedded display system for classrooms, emphasizing the use of TFT and OLED modules for dynamic information sharing.

Helen et al. [2] (2024) proposed an IoT-driven school timetable management system with cloud integration, supporting centralized control of multiple displays across campuses. Borkar et al. [6] (2024) explored the design of microcontroller-based electronic bulletin boards for rural schools, focusing on affordability and scalability. Chakraborty et al. [7] (2024) presented a smart class scheduling system with automated updates, integrating database-driven timetables with microcontroller-controlled displays. Deshmukh et al. [8] (2024) demonstrated the application of Python scripts for real-time classroom updates using embedded hardware, bridging software automation with hardware display.

Siddiqui et al. [3] (2023) introduced a GSM-based electronic notice display system with security features, highlighting reliability in information broadcasting. Prasad et al. [10] (2023) designed a wireless timetable system using Wi-Fi and Arduino, which allowed staff members to make quick changes in class schedules without manual replacement of boards. Joshi et al. [11] (2023) developed a smart classroom management system integrating sensors, displays, and automated scheduling, showcasing multi-parameter automation.

zeng et al. [7] (2022) proposed an e-classroom system where teachers could update class schedules via a mobile app, which synced with microcontroller-based displays. Verma et al. [13] (2022) implemented a real-time electronic notice board using Bluetooth and Arduino, focusing on short-range, low-cost solutions. Thakur et al. [14] (2022) designed a Raspberry Pi-based digital board with database connectivity, enabling more complex scheduling and multimedia display.

huana et al. [5] (2021) presented an ESP32-based smart timetable display with wireless connectivity, emphasizing energy efficiency and multi-classroom coverage. Jadhav et al. [16]

(2021) introduced a database-driven embedded system for displaying academic timetables dynamically, addressing the issue of frequent schedule changes. Nair et al. [17] (2021) designed a Python-integrated digital scheduling system to automate the communication between serverside data and embedded display units.

Gusev et al. [6] (2020) reviewed various IoT-based notice board systems and highlighted challenges such as scalability, power efficiency, and user-friendly interfaces. Banerjee et al. [19] (2020) implemented a Wi-Fi-based smart digital board system for educational institutions, providing a baseline for low-cost, automated displays. Gupta et al. [20] (2019)



designed an Arduino-controlled electronic information board as part of smart campus initiatives, demonstrating the potential of microcontroller-based systems in education.

These studies collectively demonstrate the growing importance of integrating embedded systems, wireless communication, and software automation in timetable and notice board management. They provide the foundation for the proposed Digital Timetable project, which combines Arduino with TFT display, Python automation, and a web interface to create a lowcost, real-time, and scalable solution for academic institutions

Paper / Project	System Architecture	Cost	Ease of Implementation	Performance	User Experience	Limitations
park et al. [1]	Arduino + GSM digital notice board	Low–Moderate (<\$50)	Moderate (GSM integration required)	Real-time SMS updates	Simple and functional	Dependent on mobile network
helen et al. [2]	ESP8266 Wi-Fi based notice board	Moderate (~\$60)	Easy (Wi-Fi setup)	Reliable wireless data updates	Userfriendly, flexible	Needs stable WiFi
Siddiqui et al. [3]	Web + IoT timetable management system	Moderate–High (~\$80)	Complex (IoT + DB integration)	Efficient schedule dissemination	Supports real-time updates	Requires IoT backend and cloud integration
huana et al. [4]	Arduino + TFT/OLED embedded display	Low (<\$40)	Easy (basic microcontroller + display)	Dynamic and lowpower display	Affordable, simple	Limited scalability to multiclass setups
gusev et al. [5]	IoT + Cloud-based timetable system	High (>\$100)	Complex (cloud setup + database handling)	Centralized control for multiple displays	Multicampus scalability	Costly and internetdependent
Proposed Project (2025)	Web + Database + Python + Arduino + TFT integration	Low–Moderate (~\$50–\$60)	Moderate (software + hardware integration)	Real-time, automated timetable updates	Intuitive for staff and students	Limited to single display (expandable)

Table 1: Comparative review of digital timetable and notice board systems.

III. PROPOSED METHODOLOGY

A disciplined process was used in the design and implementation of the Digital Timetable system, which combines web technologies, embedded hardware, and real-time data transfer to offer a practical and effective solution for managing classroom schedules. In order to provide staff and students with accurate and timely information, the proposed system would replace traditional static notice boards with a dynamic digital display that can be updated remotely.

Figure 1 shows block diagram of proposed methodology



Hierarchical Block Diagram — Output & Display divided into 3 blocks

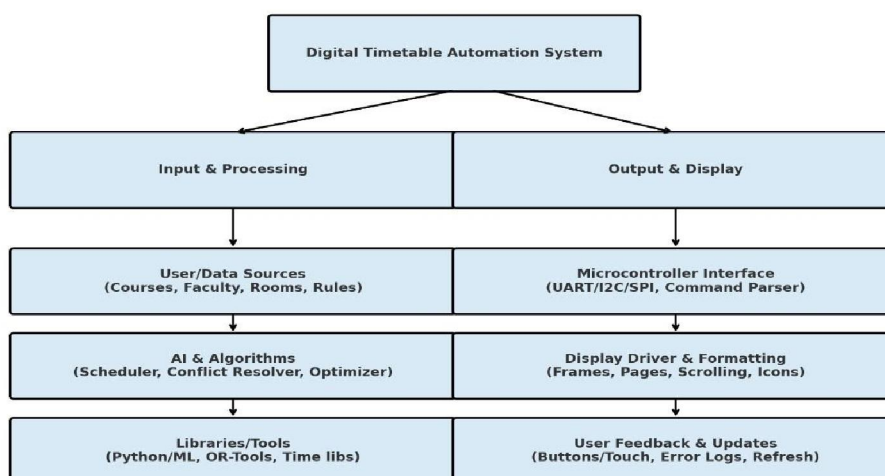


Figure1: Block Diagram of Proposed System

The central processing unit of the system is an Arduino microcontroller, which interfaces with a TFT display to show the current schedule graphically. Students always see the correct class and lecture details since the microcontroller receives schedule information in real-time and updates the display accordingly. The TFT screen improves readability and accessibility by producing high-resolution, clear output that is appropriate for classroom settings. Staff members can easily update schedules from any internet-connected device thanks to the web-based interface that manages the timetable data. A centralised database houses all web interface modifications, guaranteeing dependability and consistency. By doing away with the necessity for manual upgrades on physical boards, this approach lowers errors and saves a substantial amount of administrative work.

The database and Arduino communicate via a Python script that runs on a laptop that is connected. The script examines the timetable data, runs periodic database queries, and uses serial communication to provide the pertinent lecture data to the microcontroller. The Python module provides real-time updates in line with the academic timetable by utilising time-based routines.

The system is powered by a regulated DC supply, which protects sensitive electronics like the Arduino and TFT screen from potential power fluctuations and guarantees a constant voltage for all components. Because of its modular design, the system can easily be expanded to include more screens for additional classrooms or staff and student notifications. The Digital Timetable system offers a smooth, automated solution for academic scheduling by fusing web-based administration, embedded technology, and real-time data handling. It is a major step towards the digital revolution of classroom management since it improves operational efficiency, lessens administrative workload, and guarantees that students have immediate access to accurate scheduling information.



IV. RESULT AND DISCUSSION



FIG: FINAL RESULT(HARDWARE)

The process of creating timetables in educational institutions was effectively streamlined and automated with the development of the Digital Timetable Automation System. Through the analysis of numerous factors, including subject requirements, faculty availability, room capacity, and time constraints, the system efficiently generated precise and conflict-free schedules. It made sure that no two events overlapped and that all resources were distributed effectively by using a clever algorithm. When compared to conventional manual scheduling techniques, the system's performance showed a notable improvement in speed and accuracy. It reduced human error, such as double booking of classrooms or overlapping faculty schedules, which frequently happens during manual timetable preparation.

The Digital Timetable Automation System's deployment demonstrated the value of automation in academic administration during the discussion. By cutting down on the time needed to produce timetables and streamlining intricate scheduling processes, it improved overall efficiency. Additionally, the system showed adaptability in handling last-minute modifications, like changing classes or rooms, without interfering with the overall plan. Furthermore, the system's scalability enabled it to manage expanding institutional data and more courses or departments with reliable performance. The results showed that implementing such an automated system not only increases productivity but also encourages precision and openness in scheduling. However, the current version of the system only allows for scheduling in the classroom; it lacks more sophisticated capabilities like automated alerting systems and interaction with online learning platforms.



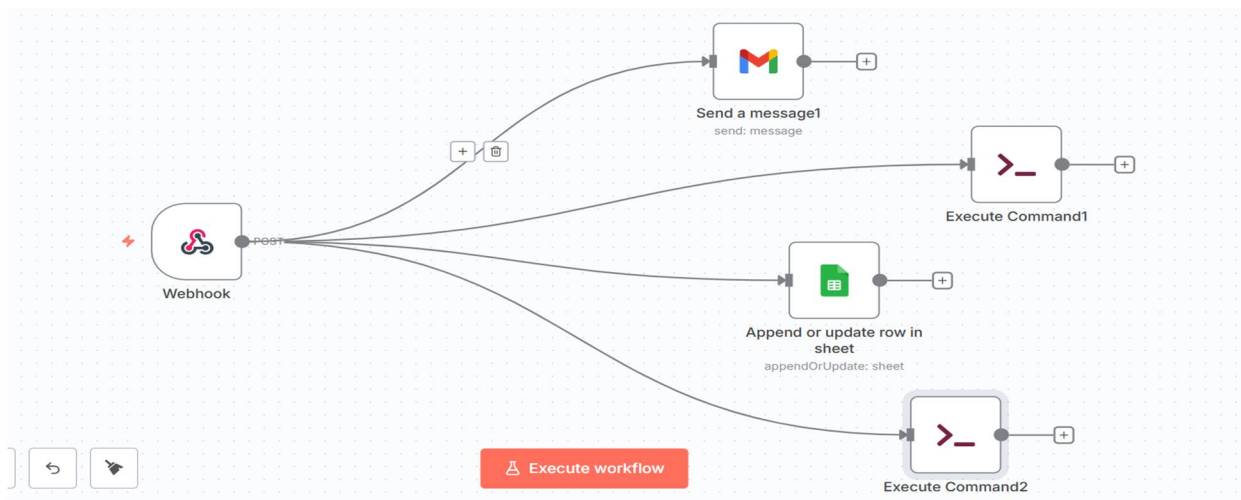


FIG. FINAL RESULTS (SOFTWARE)

These areas could be the focus of future developments to improve its usability and adaptability even more. All things considered, the findings show that the Digital Timetable Automation System offers a dependable, precise, and time-saving academic scheduling solution. Its effective deployment shows how automation technology can enhance resource management and institutional operations

V. CONCLUSION

The Digital Timetable system, which combines web technologies, embedded hardware, and real-time data exchange into a unified and effective solution, is a major step towards modernising classroom administration. Conventional approaches, such as printed schedules and static notice boards, frequently result in missed lectures, out-of-date information, and administrative inefficiencies. By automating timetable changes and presenting dynamic schedules on a TFT screen managed by an Arduino microcontroller, this solution overcomes those difficulties.

Staff members may readily update schedules without the delays of manual processes thanks to a Python script that synchronises the timetable with a central database via a web interface, while the hardware guarantees visibility and dependability. Stability is guaranteed by the addition of a regulated power supply, and the system's modular design allows it to be expanded to.

Beyond its technical features, the Digital Timetable system supports educational institutions' larger digital transformation. It helps students manage their time effectively, decreases confusion, and increases timeliness by giving them real-time access to precise schedule information. An adaptable and user-friendly management system that minimises mistakes, lessens workload, and guarantees regular communication with students is advantageous to staff members. Integration of mobile apps can improve the system even more.

In the end, the Digital Timetable makes learning smarter and more effective. It is particularly helpful for schools with busy schedules or big student bodies, and it is a significant step towards completely digital academic administration.

REFERENCES

1. Park, S., Lee, C., Jeong, S., Lee, J., Kim, D., Jang, Y., Seol, W., Kim, H., & Ahn, S. (2024). Digital Twin and Deep Reinforcement Learning-Driven Robotic Automation System for Confined Workspaces: A Nozzle Dam Replacement Case Study in Nuclear Power Plants. *International Journal of Precision Engineering and Manufacturing-Green Technology*.
2. B, A., Jk, A., Praveena, M.D., Asha, P., Helen, L.S., & Nandini, D.U. (2025). TimeTable Automation System: An Efficient Solution for Academic Schedule Handling. *2025 7th International Conference on Intelligent Sustainable Systems (ICISS)*, 1322-1327.



3. Siddiqui, M., Kahandawa, G., & Hewawasam, H.S. (2023). Artificial Intelligence Enabled Digital Twin For Predictive Maintenance in Industrial Automation System: A Novel Framework and Case Study. *2023 IEEE International Conference on Mechatronics (ICM)*, 1-6.
4. Park, Y., Kim, S., Jang, B., Kim, N., Kim, W., & Lee, N.H. (2022). Development of the Testing Automation System for verifying interoperability of Digital Substation. *2022 6th International Conference on Electric Power Equipment - Switching Technology (ICEPEST)*, 363-366.
5. Huang, H., Yang, L., Wang, Y., Xu, X., & Lu, Y. (2021). Digital Twin-driven online anomaly detection for an automation system based on edge intelligence. *Journal of Manufacturing Systems*, 59, 138-150.
6. Gusev, Y.P., Trofimov, A.V., & Trofimov, V.A. (2020). Design Database of Cad System as the Basis of the Digital Twin of the Automation System of Power Plants and Substations. *Power Technology and Engineering*, 54, 418 - 423.
7. Zeng, R., Cao, Y., Li, Y., Hu, S., Shao, X., Xie, L., Hou, L., Zhao, L., & Shahidehpour, M. (2024). A General Real-Time Cyberattack Risk Assessment Method for Distribution Network Involving the Influence of Feeder Automation System. *IEEE Transactions on Smart Grid*, 15, 2102-2115.
8. Egeubayeva, Z., Alzhanov, A., Akhmetova, G., & Serikkazy, A. (2024). Optimization of the book management and automation system in school libraries in Kazakhstan. *ELearning and Digital Media*.
9. Egeubayeva, Z., Alzhanov, A., Akhmetova, G., & Serikkazy, A. (2024). Optimization of the book management and automation system in school libraries in Kazakhstan. *ELearning and Digital Media*.
10. Maryasin, O.Y. (2019). Home Automation System Ontology for Digital Building Twin. *2019 XXI International Conference Complex Systems: Control and Modeling Problems (CSCMP)*, 70-74.
11. Madahian, A., Ardakani, P.A., Abouei, J., Mirvakili, A., Mohammadi, A., & Koomson, V.J. (2023). A Hybrid VLC/RF Parking Automation System. *IEEE Access*, 11, 6696066978.
12. Chipriyanova, G., & Krasteva-Hristova, R. (2023). TECHNOLOGICAL ASPECTS OF ACCOUNTING AUTOMATION SYSTEM AS A DECISION SUPPORT SYSTEM. *ENVIRONMENT. TECHNOLOGIES. RESOURCES. Proceedings of the International Scientific and Practical Conference*.
13. Agrawal, S.A., Rastogi, S., & Trivedi, S.K. (2023). Cloud Based Hostel Facility Automation System. *2023 International Conference on Computational Intelligence, Communication Technology and Networking (CICTN)*, 228-234.
14. Simhadri, S.K., Patnala, M.K., & Simhadri, P.K. (2018). A REAL TIME IMPLEMENTATION OF SMART AUTOMATION SYSTEM & DIGITAL CIRCULAR BOARD USING ANDROID, GSM, ARM-7 BASED TECHNOLOGIES. *Journal of Engineering and Technology*, 5, 34-37.
15. Huang, W., Liao, S., Huang, H., Su, Y., Jerng, J., Lu, C., Ho, W., & Xu, J. (2024). A case study of lean digital transformation through robotic process automation in healthcare. *Scientific Reports*, 14.
16. Mohammed, M.A., Mohammed, M.A., & Mohammed, V.A. (2022). Impact of Artificial Intelligence on the Automation of Digital Health System. *International Journal of Software Engineering & Applications*.
17. Qamsane, Y., Phillips, J.R., Savaglio, C., Warner, D., James, S.C., & Barton, K. (2022). Open Process Automation- and Digital Twin-Based Performance Monitoring of a Process Manufacturing System. *IEEE Access*, 10, 60823-60835.
18. Qamsane, Y., Phillips, J.R., Savaglio, C., Warner, D., James, S.C., & Barton, K. (2022). Open Process Automation- and Digital Twin-Based Performance Monitoring of a Process Manufacturing System. *IEEE Access*, 10, 60823-60835.
19. Martinez, E.M., Ponce, P., Macias, I., & Molina, A. (2021). Automation Pyramid as Constructor for a Complete Digital Twin, Case Study: A Didactic Manufacturing System. *Sensors (Basel, Switzerland)*, 21.
20. Zulfahmi, A.A., Sadikin, R., & Hermaliani, E.H. (2022). Hybrid Between PIECES Framework and Technology Acceptance Model (TAM) in Quality Testing Of Mobile Application Office Automation System (eKEMENKEU). *Journal of Applied Engineering and Technological Science (JAETS)*.
21. Gehrmann, C., & Gunnarsson, M. (2020). A Digital Twin Based Industrial Automation and Control System Security Architecture. *IEEE Transactions on Industrial Informatics*, 16, 669-680.



22. Bhavani, M. Lalitha et al. "Online Voice based Smart Security and Automation System for Real Time Application using Artificial Intelligence." *2022 International Conference on Automation, Computing and Renewable Systems (ICACRS)* (2022): 756-761.
23. Ashraf, Suleman et al. "Denial-of-Service Attack on IEC 61850-Based Substation Automation System: A Crucial Cyber Threat towards Smart Substation Pathways." *Sensors (Basel, Switzerland)* 21 (2021): n. pag.
24. Hong, Junho et al. "Implementation of Secure Sampled Value (SeSV) Messages in Substation Automation System." *IEEE Transactions on Power Delivery* 37 (2021): 405414.
25. Kumar, Shantanu et al. "Toward a Substation Automation System Based on IEC 61850." *Electronics* (2021): n. pag.
26. Hammar, Kim and Rolf Stadler. "Digital Twins for Security Automation." *NOMS 2023/2023 IEEE/IFIP Network Operations and Management Symposium* (2023): 1-6.
27. Mustafa, Bilal et al. "IOT Based Low-Cost Smart Home Automation System." *2021 3rd International Congress on Human-Computer Interaction, Optimization and Robotic Applications (HORA)* (2021): 1-6.
28. Başçiftçi, Fatih and Lencho Miesso Bokiye. "IoT Based Library Management Automation System Using RFID." *2021 IEEE 21st International Symposium on Computational Intelligence and Informatics (CINTI)* (2021): 000021-000024.
29. Galkin, Nikolai et al. "Automatic Generation of Data Centre Digital Twins for Virtual Commissioning of Their Automation Systems." *IEEE Access* 11 (2023): 4633-4644.
30. Jian, Qingzhi et al. "Application Of AI Technology On Power Dispatching Automation System." *2021 Power System and Green Energy Conference (PSGEC)* (2021): 726-731.
31. Godase, M. V., Mulani, A., Ghodak, M. R., Birajadar, M. G., Takale, M. S., & Kolte, M. A MapReduce and Kalman Filter based Secure IIoT Environment in Hadoop. *Sanshodhak*, Volume 19, June 2024.
32. Mulani, A. O., & Mane, P. B. (2017). Watermarking and cryptography based image authentication on reconfigurable platform. *Bulletin of Electrical Engineering and Informatics*, 6(2), 181-187.
33. Gadade, B., Mulani, A. O., & Harale, A. D. IoT Based Smart School Bus and Student Tracking System. *Sanshodhak*, Volume 19, June 2024.
34. Dhanawadel, A., Mulani, A. O., & Pise, A. C. IOT based Smart farming using Agri BOT. *Sanshodhak*, Volume 20, June 2024.
35. Mulani, A., & Mane, P. B. (2016). DWT based robust invisible watermarking. *Scholars' Press*.
36. R. G. Ghodke, G. B. Birajdar, A.O. Mulani, G.N. Shinde, R.B. Pawar, Design and Development of an Efficient and Cost-Effective surveillance Quadcopter using Arduino, *Sanshodhak*, Volume 20, June 2024.
37. R. G. Ghodke, G. B. Birajdar, A.O. Mulani, G.N. Shinde, R.B. Pawar, Design and Development of Wireless Controlled ROBOT using Bluetooth Technology, *Sanshodhak*, Volume 20, June 2024.
38. Swami, S. S., & Mulani, A. O. (2017, August). An efficient FPGA implementation of discrete wavelet transform for image compression. In *2017 International Conference on Energy, Communication, Data Analytics and Soft Computing (ICECDS)* (pp. 3385-3389). IEEE.
39. Mane, P. B., & Mulani, A. O. (2018). High speed area efficient FPGA implementation of AES algorithm. *International Journal of Reconfigurable and Embedded Systems*, 7(3), 157-165.
40. 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.
41. Kashid, M. M., Karande, K. J., & Mulani, A. O. (2022, November). IoT-based environmental parameter monitoring using machine learning approach. In *Proceedings of the International Conference on Cognitive and Intelligent Computing: ICCIC 2021*, Volume 1 (pp. 43-51). Singapore: Springer Nature Singapore.
42. Nagane, U. P., & Mulani, A. O. (2021). Moving object detection and tracking using Matlab. *Journal of Science and Technology*, 6(1), 2456-5660.



43. Kulkarni, P. R., Mulani, A. O., & Mane, P. B. (2016). Robust invisible watermarking for image authentication. In *Emerging Trends in Electrical, Communications and Information Technologies: Proceedings of ICECIT-2015* (pp. 193-200). Singapore: Springer Singapore.
44. Ghodake, M. R. G., & Mulani, M. A. (2016). Sensor based automatic drip irrigation system. *Journal for Research*, 2(02).
45. Mandwale, A. J., & Mulani, A. O. (2015, January). Different Approaches For Implementation of Viterbi decoder on reconfigurable platform. In *2015 International Conference on Pervasive Computing (ICPC)* (pp. 1-4). IEEE.
46. Jadhav, M. M., Chavan, G. H., & Mulani, A. O. (2021). Machine learning based autonomous fire combat turret. *Turkish Journal of Computer and Mathematics Education*, 12(2), 2372-2381.
47. Shinde, G., & Mulani, A. (2019). A robust digital image watermarking using DWT-PCA. *International Journal of Innovations in Engineering Research and Technology*, 6(4), 1-7.
48. Mane, D. P., & Mulani, A. O. (2019). High throughput and area efficient FPGA implementation of AES algorithm. *International Journal of Engineering and Advanced Technology*, 8(4).
49. Mulani, A. O., & Mane, D. P. (2017). An Efficient implementation of DWT for image compression on reconfigurable platform. *International Journal of Control Theory and Applications*, 10(15), 1-7.
50. Deshpande, H. S., Karande, K. J., & Mulani, A. O. (2015, April). Area optimized implementation of AES algorithm on FPGA. In *2015 International Conference on Communications and Signal Processing (ICCSP)* (pp. 0010-0014). IEEE.
51. Deshpande, H. S., Karande, K. J., & Mulani, A. O. (2014, April). Efficient implementation of AES algorithm on FPGA. In *2014 International Conference on Communication and Signal Processing* (pp. 1895-1899). IEEE.
52. Kulkarni, P., & Mulani, A. O. (2015). Robust invisible digital image watermarking using discrete wavelet transform. *International Journal of Engineering Research & Technology (IJERT)*, 4(01), 139-141.
53. 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 Smart Materials for Energy Applications.
54. Mulani, A. O., & Shinde, G. N. (2021). An approach for robust digital image watermarking using DWT-PCA. *Journal of Science and Technology*, 6(1).
55. Mulani, A. O., & Mane, P. B. (2014, October). Area optimization of cryptographic algorithm on less dense reconfigurable platform. In *2014 International Conference on Smart Structures and Systems (ICSSS)* (pp. 86-89). IEEE.
56. 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.
57. 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(2), 56-61.
58. 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), 173-176.
59. Takale, S., & Mulani, A. (2022). DWT-PCA based video watermarking. *Journal of Electronics, Computer Networking and Applied Mathematics (JECNAM)* ISSN, 2799-1156.
60. Kamble, A., & Mulani, A. O. (2022). Google assistant based device control. *Int. J. of Aquatic Science*, 13(1), 550-555.
61. Kondekar, R. P., & Mulani, A. O. (2017). Raspberry Pi based voice operated Robot. *International Journal of Recent Engineering Research and Development*, 2(12), 69-76.
62. Ghodake, R. G., & Mulani, A. O. (2018). Microcontroller based automatic drip irrigation system. In *Techno-Societal 2016: Proceedings of the International Conference on Advanced Technologies for Societal Applications* (pp. 109-115). Springer International Publishing.



63. 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.
64. Boxey, A., Jadhav, A., Gade, P., Ghanti, P., & Mulani, A. O. (2022). Face Recognition using Raspberry Pi. *Journal of Image Processing and Intelligent Remote Sensing (JIPIRS)* ISSN, 2815-0953.
65. Patale, J. P., Jagadale, A. B., Mulani, A. O., & Pise, A. (2023). A Systematic survey on Estimation of Electrical Vehicle. *Journal of Electronics, Computer Networking and Applied Mathematics (JECNAM)* ISSN, 2799-1156.
66. Gadade, B., & Mulani, A. (2022). Automatic System for Car Health Monitoring. *International Journal of Innovations in Engineering Research and Technology*, 57-62.
67. Shinde, M. R. S., & Mulani, A. O. (2015). Analysis of Biomedical Image Using Wavelet Transform. *International Journal of Innovations in Engineering Research and Technology*, 2(7), 1-7.
68. Mandwale, A., & Mulani, A. O. (2014, December). Implementation of convolutional encoder & different approaches for viterbi decoder. In *IEEE International Conference on Communications, Signal Processing Computing and Information technologies*.
69. Mulani, A. O., Jadhav, M. M., & Seth, M. (2022). Painless machine learning approach to estimate blood glucose level with non-invasive devices. In *Artificial intelligence, internet of things (IoT) and smart materials for energy applications* (pp. 83-100). CRC Press.
70. 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.
71. Utpat, V. B., Karande, D. K., & Mulani, D. A. Grading of Pomegranate Using Quality Analysis. *International Journal for Research in Applied Science & Engineering Technology (IJRASET)*, 10.
72. Takale, S., & Mulani, D. A. (2022). Video Watermarking System. *International Journal for Research in Applied Science & Engineering Technology (IJRASET)*, 10.
73. Mandwale, A., & Mulani, A. O. (2015, January). Different approaches for implementation of Viterbi decoder. In *IEEE international conference on pervasive computing (ICPC)*.
74. Maske, Y., Jagadale, M. A., Mulani, A. O., & Pise, A. (2021). Implementation of BIOBOT System for COVID Patient and Caretakers Assistant Using IOT. *International Journal of Information Technology and*, 30-43.
75. Mulani, A. O., & Mane, D. P. (2016). Fast and Efficient VLSI Implementation of DWT for Image Compression. *International Journal for Research in Applied Science & Engineering Technology*, 5, 1397-1402.
76. Kambale, A. (2023). Home automation using google assistant. *UGC care approved journal*, 32(1), 1071-1077.
77. 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.
78. Korake, D. M., & Mulani, A. O. (2016). Design of Computer/Laptop Independent Data transfer system from one USB flash drive to another using ARM11 processor. *International Journal of Science, Engineering and Technology Research*.
79. Mandwale, A., & Mulani, A. O. (2016). Implementation of High Speed Viterbi Decoder using FPGA. *International Journal of Engineering Research & Technology, IJERT*.
80. 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.
81. Shinde, R., & Mulani, A. O. (2015). Analysis of Biomedical Image. *International Journal on Recent & Innovative trend in technology (IJRITT)*.
82. Sawant, R. A., & Mulani, A. O. (2022). Automatic PCB Track Design Machine. *International Journal of Innovative Science and Research Technology*, 7(9).
83. 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* (ISSN No: 2454-7875).
84. Gadade, B., Mulani, A. O., & Harale, A. D. (2024). Iot based smart school bus and student monitoring system. *Naturalista Campano*, 28(1), 730-737.



85. 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.
86. Salunkhe, D. S. S., & Mulani, D. A. O. (2024). Solar Mount Design Using High-Density Polyethylene. *NATURALISTA CAMPANO*, 28(1).
87. Seth, 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 Energy Applications*.
88. Kolhe, V. A., Pawar, S. Y., Gohery, S., Mulani, A. O., Sundari, M. S., Kiradoo, G., ... & Sunil, J. (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.
89. Basawaraj Birajadar, G., Osman Mulani, A., Ibrahim Khalaf, O., Farhah, N., G Gawande, P., Kinage, K., & Abdullah Hamad, A. (2024). Epilepsy identification using hybrid CoPro-DCNN classifier. *International Journal of Computing and Digital Systems*, 16(1), 783-796.
90. 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)* ISSN, 2799-1156.
91. Godse, A. P. A.O. Mulani (2009). *Embedded Systems (First Edition)*.
92. Pol, R. S., Bhalerao, M. V., & Mulani, A. O. A real time IoT based System Prediction and Monitoring of Landslides. *International Journal of Food and Nutritional Sciences*, Volume 11, Issue 7, 2022.
93. Mulani, A. O., Sardey, M. P., Kinage, K., Salunkhe, S. S., Fegade, T., & Fegade, P. G. (2025). ML-powered Internet of Medical Things (MLIOMT) structure for heart disease prediction. *Journal of Pharmacology and Pharmacotherapeutics*, 16(1), 38-45.
94. Aiwale, S., Kolte, M. T., Harpale, V., Bendre, V., Khurge, D., Bhandari, S., ... & Mulani, A. O. (2024). Non-invasive Anemia Detection and Prediagnosis. *Journal of Pharmacology and Pharmacotherapeutics*, 15(4), 408-416.
95. Mulani, A. O., Bang, A. V., Birajadar, G. B., Deshmukh, A. B., Jadhav, H. M., & Liyakat, K. K. S. (2024). IoT Based Air, Water, and Soil Monitoring System for Pomegranate Farming. *Annals of Agri-Bio Research*, 29(2), 71-86.
96. Kulkarni, T. M., & Mulani, A. O. (2024). Face Mask Detection on Real Time Images and Videos using Deep Learning. *International Journal of Electrical Machine Analysis and Design (IJEMAD)*, 2(1).
97. 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.
98. Pol, D. R. S. (2021). Cloud Based Memory Efficient Biometric Attendance System Using Face Recognition. *Stochastic Modeling & Applications*, 25(2).
99. Nagtilak, M. A. G., Ulegaddi, M. S. N., Adat, M. A. S., & Mulani, A. O. (2021). Breast Cancer Prediction using Machine Learning.
100. Rahul, G. G., & Mulani, A. O. (2016). *Microcontroller Based Drip Irrigation System*.
101. Kulkarni, T. M., & Mulani, A. O. Deep Learning Based Face-Mask Detection: An Approach to Reduce Pandemic Spreads in Human Healthcare. *African Journal of Biological Sciences*, 6(6), 2024.
102. Mulani, A., & Mane, P. B. (2016). *DWT based robust invisible watermarking*. Scholars' Press.
103. Dr. Vaishali Satish Jadhav, Dr. Shweta Sadanand Salunkhe, Dr. Geeta Salunkhe, Pranali Rajesh Yawle, Dr. Rahul S. Pol, Dr. Altaf Osman Mulani, Dr. Manish Rana, Iot Based Health Monitoring System for Human, *Afr. J. Biomed. Res. Vol. 27 (September 2024)*.
104. Dr. Vaishali Satish Jadhav, Geeta D. Salunke, Kalyani Ramesh Chaudhari, Dr. Altaf Osman Mulani, Dr. Sampada Padmakar Thigale, Dr. Rahul S. Pol, Dr. Manish Rana, Deep Learning-Based Face Mask Recognition in Real-Time Photos and Videos, *Afr. J. Biomed. Res. Vol. 27 (September 2024)*.
105. Altaf Osman Mulani, Electric Vehicle Parameters Estimation Using Web Portal, *Recent Trends in Electronics & Communication Systems*, Volume 10, Issue 3, 2023.



106. Aryan Ganesh Nagtilak, Sneha Nitin Ulegaddi, Mahesh Mane, Altaf O. Mulani, Automatic Solar Powered Pesticide Sprayer for Farming, International Journal of Microwave Engineering and Technology, Volume 9 No. 2, 2023.
107. Annasaheb S. Dandage, Vitthal R. Rupnar, Tejas A Pise, and A. O. Mulani, Real-Time Language Translation Application Using Tkinter. International Journal of Digital Communication and Analog Signals. 2025; 11(01): -p.
108. AnnaSaheb S Dandage, Vitthal R. Rupnar, Tejas A Pise, and A. O. Mulani, IoT-Powered Weather Monitoring and Irrigation Automation: Transforming Modern Farming Practices. . 2025; 11(01): -p.
109. Mulani, A.O., Kulkarni, T.M. (2025). Face Mask Detection System Using Deep Learning: A Comprehensive Survey. 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_3.
110. Karve, S., Gangonda, S., Birajadar, G., Godase, V., Ghodake, R., Mulani, A.O. (2025). Optimized Neural Network for Prediction of Neurological Disorders. 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 2440. Springer, Cham. https://doi.org/10.1007/978-3-031-88762-8_18.
111. Saurabh Singh, Karm Veer Arya, Ciro Rodriguez Rodriguez, and Altaf Osman Mulani, Emerging Trends in Artificial Intelligence, Data Science and Signal Processing, Communications in Computer and Information Science (CCIS), volume 2440.
112. Saurabh Singh, Karm Veer Arya, Ciro Rodriguez Rodriguez, and Altaf Osman Mulani, Emerging Trends in Artificial Intelligence, Data Science and Signal Processing, Communications in Computer and Information Science (CCIS), volume 2439.
113. Godase, V., Mulani, A., Pawar, A., & Sahani, K. (2025). A Comprehensive Review on PIR Sensor-Based Light Automation Systems. International Journal of Image Processing and Smart Sensors, 1(1), 22-29.
114. Godase, V., Mulani, A., Takale, S., & Ghodake, R. (2025). Comprehensive Review on Automated Field Irrigation using Soil Image Analysis and IoT. Journal of Advance Electrical Engineering and Devices, 3(1), 46-55.
115. Altaf Osman Mulani, Deshmukh M., Jadhav V., Chaudhari K., Mathew A.A., Shweta Salunkhe. Transforming Drug Therapy with Deep Learning: The Future of Personalized Medicine. Drug Research. 2025 Aug 29.
116. Altaf O. Mulani, Vaibhav V. Godase, Swapnil R. Takale, Rahul G. Ghodake (2025), Image Authentication Using Cryptography and Watermarking, International Journal of Image Processing and Smart Sensors, Vol. 1, Issue 2, pp 27-34.
117. Altaf O. Mulani, Vaibhav V. Godase, Swapnil R. Takale, Rahul G. Ghodake (2025), Advancements in Artificial Intelligence: Transforming Industries and Society, International Journal of Artificial Intelligence of Things (AIoT) in Communication Industry, Vol. 1, Issue 2, pp 1-5.
118. Altaf O. Mulani, Vaibhav V. Godase, Swapnil R. Takale, Rahul G. Ghodake (2025), AI-Powered Predictive Analytics in Healthcare: Revolutionizing Disease Diagnosis and Treatment, Journal of Advance Electrical Engineering and Devices, Vol. 3, Issue 2, pp 27-34.
119. Godase, V., Mulani, A., Takale, S., & Ghodake, R. (2025). A Holistic Review of Automatic Drip Irrigation Systems: Foundations and Emerging Trends. Available at SSRN 5247778.
120. V. Godase, R. Ghodake, S. Takale, and A. Mulani, —Design and Optimization of Reconfigurable Microwave Filters Using AI Techniques, International Journal of RF and Microwave Communication Technologies, vol. 2, no. 2, pp.26–41, Aug. 2025.
121. V. Godase, A. Mulani, R. Ghodake, S. Takale, “Automated Water Distribution Management and Leakage Mitigation Using PLC Systems,” Journal of Control and Instrumentation Engineering, vol.11, no. 3, pp. 1-8, Aug. 2025.



122. V. Godase, A. Mulani, R. Ghodake, S. Takale, "PLC-Assisted Smart Water Distribution with Rapid Leakage Detection and Isolation," *Journal of Control Systems and Converters*, vol. 1, no. 3, pp. 1-13, Aug. 2025.
123. V. V. Godase, S. R. Takale, R. G. Ghodake, and A. Mulani, "Attention Mechanisms in Semantic Segmentation of Remote Sensing Images," *Journal of Advancement in Electronics Signal Processing*, vol. 2, no. 2, pp. 45–58, Aug. 2025.
124. D. Waghmare, A. Mulani, S. R. Takale, V. Godase, and A. Mulani, "A Comprehensive Review on Automatic Fruit Sorting and Grading Techniques with Emphasis on Weight-based Classification," *Research & Review: Electronics and Communication Engineering*, vol. 2, no. 3, pp. 1-10, Oct. 2025.
125. Karande, K. J., & Talbar, S. N. (2014). Independent component analysis of edge information for face recognition. Springer India.
126. Karande, K. J., & Talbar, S. N. (2008). Face recognition under variation of pose and illumination using independent component analysis. ICGST-GVIP, ISSN.
127. Kawathekar, P. P., & Karande, K. J. (2014, July). Severity analysis of Osteoarthritis of knee joint from X-ray images: A Literature review. In 2014 International Conference on Signal propagation and computer technology (ICSPCT 2014) (pp. 648-652). IEEE.
128. Daithankar, M. V., Karande, K. J., & Harale, A. D. (2014, April). Analysis of skin color models for face detection. In 2014 International Conference on Communication and Signal Processing (pp. 533-537). IEEE.
129. Karande, J. K., Talbar, N. S., & Inamdar, S. S. (2012, May). Face recognition using oriented Laplacian of Gaussian (OLOG) and independent component analysis (ICA). In 2012 Second International Conference on Digital Information and Communication Technology and it's Applications (DICTAP) (pp. 99-103). IEEE.
130. 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 (IJPREAMS)*, 05(03), 2427–2433. <https://www.ijprems.com>
131. 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>
132. Bankar, A. S., Harale, A. D., & Karande, K. J. (2021). Gestures Controlled Home Automation using Deep Learning: A Review. *International Journal of Current Engineering and Technology*, 11(06), 617–621. <https://doi.org/10.14741/ijcet/v.11.6.4>
134. Mali, A. S., Ghadge, S. K., Adat, A. S., & Karande, S. V. (2024). Intelligent Medication Management System. *IJSRD - International Journal for Scientific Research & Development*, Vol. 12(Issue 3).
135. Water Level Control, Monitoring and Altering System by using GSM in Irrigation Based on Season. (2019). In *International Research Journal of Engineering and Technology (IRJET)* (Vol. 06, Issue 04, p. 1035) [Journal-article]. <https://www.irjet.net>
136. Modi, S., Misal, V., Kulkarni, S., & Mali A.S. (2025). Hydroponic Farming Monitoring System - Automated system to monitor and control nutrient and pH levels. In *Journal of Microcontroller Engineering and Applications* (Vol. 12, Issue 3, pp. 11–16). <https://doi.org/10.37591/JoMEA>
137. 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>.
138. 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.
139. Siddheshwar S. Gangonda, Prashant P. Patavardhan, Kailash J. Karande, "Recognition of Marathi Numerals Using MFCC and DTW Features", Book Title: Recent Trends on Image Processing and Pattern Recognition,



- RTIP2R 2018, CCIS 1037, pp. 1–11, © Springer Nature Singapore Pte Ltd. 2019 https://doi.org/10.1007/978-981-13-9187-3_17.
140. Siddheshwar S. Gangonda, Prashant P. Patavardhan, Kailash J. Karande, “Analysis of Face Recognition Algorithms for Uncontrolled Environments”, Book Title: Computing, Communication and Signal Processing, pp. 919–926, © Springer Nature Singapore Pte Ltd. 2018.
 141. 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.
 142. 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.
 143. Siddheshwar S. Gangonda, Prashant P. Patavardhan, Kailash J. Karande, “An Extensive Survey of Prominent Researches in Face Recognition under different Conditions”, 4th International Conference on Computing, Communication, Control And Automation (ICCUBEA-2018), 16th to 18th Aug. 2018 organized by Pimpri Chinchwad College of Engineering (PCCOE), Pune, India.
 144. Siddheshwar S. Gangonda, Prashant P. Patavardhan, Kailash J. Karande, “Analysis of Face Recognition Algorithms for Uncontrolled Environments”, 3rd International Conference on Computing, Communication and Signal Processing (ICCASP 2018), 26th-27th Jan.2018, organized by Dr. BATU, Lonere, India.
 145. Siddheshwar Gangonda and Prachi Mukherji, “Speech Processing for Marathi Numeral Recognition”, International Conference on Recent Trends, Feb 2012, IOK COE, Pune.
 146. S. S. Gangonda, “Bidirectional Visitor Counter with automatic Door Lock System”, National Conference on Computer, Communication and Information Technology (NCCCIT-2018), 30th and 31st March 2018 organized by Department of Electronics and Telecommunication Engineering, SKN SCOE, Korti, Pandharpur.
 147. Siddheshwar Gangonda and Prachi Mukherji, “Speech Processing for Marathi Numeral Recognition using MFCC & DTW Features”, ePGCON 2012, 23rd and 24th April 2012 organized by Commins COE for Woman, Pune.
 148. Siddheshwar Gangonda and Prachi Mukherji, “Speech Processing for Marathi Numeral Recognition”, National Conference on Emerging Trends in Engineering and Technology (VNCET'12), 30th March 2012 organized by Vidyavardhini's College of Engineering and Technology, Vasai Road, Thane.
 149. Siddheshwar Gangonda and Prachi Mukherji, “Speech Processing for Marathi Numeral Recognition”, ePGCON 2011, 26th April 2011 organized by MAEER's MIT, Kothrud, Pune-38.
 150. Siddheshwar Gangonda, “Medical Image Processing”, Aavishkar-2K7, 17th and 18th March 2007 organized by Department of Electronics and Telecommunication Engineering, SVERI's COE, Pandharpur.
 151. Siddheshwar Gangonda, “Image enhancement & Denoising”, VISION 2k7, 28th Feb-2nd March 2007 organized by M.T.E. Society's Walchand College of Engineering, Sangli.
 152. Siddheshwar Gangonda, “Electromagnetic interference & compatibility” KSHITIJ 2k6, 23rd and 24th Sept. 2006 organized by Department of Mechanical Engineering, SVERI's COE, Pandharpur.
 153. A. Pise and K. Karande, “A genetic Algorithm-Driven Energy-Efficient routing strategy for optimizing performance in VANETs,” Engineering Technology and Applied Science Research, vol. 15, no. 5, 2025, [Online]. Available: <https://etasr.com/index.php/ETASR/article/view/12744>
 154. A. C. Pise, K. J. Karande, “Investigating Energy-Efficient Optimal Routing Protocols for VANETs: A Comprehensive Study”, ICT for Intelligent Systems, Lecture Notes in Networks and Systems 1109, Proceedings of ICTIS 2024 Volume 3, Lecture Notes in Networks and Systems, Springer, Singapore, ISSN 2367-3370, PP 407-417, 29 October 2024 https://doi.org/10.1007/978-981-97-6675-8_33.
 155. A. C. Pise, et. al., “Smart Vehicle: A Systematic Review”, International Journal - The Ciência & Engenharia - Science & Engineering Journal ISSN: 0103-944X Volume 11 Issue 1, 2023pp: 992–998, 2023.



156. A. C. Pise, et. al., "Smart Vehicle: A Systematic Review", International Journal of Research Publication and Reviews, ISSN 2582-7421, Vol 4, no 10, pp 2728-2731 October 2023.
157. A. C. Pise, et. al., "Development of BIOBOT System to Assist COVID Patient and Caretakers", European Journal of Molecular and Clinical Medicine ; 10(1):3472-3480, 2023.
158. A. C. Pise, et. al., "IoT Based Landmine Detection Robot", International Journal of Research in Science & Engineering ISSN: 2394-8299 Vol: 03, No. 04, June-July 2023.
159. A. C. Pise, et. al., "A Systematic survey on Estimation of Electrical Vehicle", Journal of Electronics, Computer Networking and Applied Mathematics (JECNAM) ISSN: 2799-1156, Volume 3, Issue 01, Pages 1-6, December 2023.
160. A. C. Pise, et. al., "Python Algorithm to Estimate Range of Electrical Vehicle", Web of Science, Vol 21, No 1 (2022) December 2022
161. A. C. Pise, et. al., "Implementation of BIOBOT System for COVID Patient and Caretakers Assistant using IOT", International Journal of Information technology and Computer Engineering. 30-43. 10.55529/ijite.21.30.43, (2022).
162. A. C. Pise, et. al., "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.
163. A. C. Pise, Dr. K. J. Karande, "An Exploratory study of Cluster Based Routing Protocol in VANET: A Review", International Journal of Advanced Research in Engineering and Technology(IJARET), 12,10, 2021, 17-30, Manuscript ID :00000-94375 Source ID : 00000006, Journal_uploads/IJARET/VOLUME_12_ISSUE_10/IJARET_12_10_002.pdf
164. A. C. Pise, et. al., "Android based Portable Health Support System," A Peer Referred & Indexed International Journal of Research, Vol.8, issue.4 , April 2019.
165. A. C. Pise, et. al., "Facial Expression Recognition Using Image Processing," International Journal of VLSI Design, Microelectronics and Embedded System, Vol.3, issue.2 , July 2018.
166. A. C. Pise, et. al., "Detection of Cast Iron Composition by Cooling Curve Analysis using Thermocouple Temperature Sensor," UGC Approved International Journal of Academic Science (IJRECE), Vol.6, Issue.3 , July-September 2018.
167. A. C. Pise, et. al., "Android Based Portable Health Support", System International Journal of Engineering Sciences & Research Technology (IJESRT 2017) Vol.6, Issue 8, pp 85-88 5th Aug 2017
168. A. C. Pise, et. al., "Adaptive Noise Cancellation in Speech Signal", International Journal of Innovative Engg and Technology, 2017
169. A. C. Pise, et. al., "Lung Cancer Detection System by using Baysian Classifier", ISSN 2454-7875, IJRPET, published online in conference special issue VESCOMM-2016, February 2016
170. A. C. Pise, et. al., "Review on Agricultural Plant Diseases Detection by Image Processing", ISSN 2278-62IX, IJLTET, Vol 7, Issue 1 May 2016
171. A. C. Pise, et. al. "Segmentation of Retinal Images for Glaucoma Detection", International Journal of Engineering Research and Technology (06, June-2015).
172. A. C. Pise, et. al. "Color Local Texture Features Based Face Recognition", International Journal of Innovations in Engineering and Technology(IJiet) , Dec. 2014
173. A. C. Pise, et. al. "Single Chip Solution For Multimode Robotic Control", International Journal of Engineering Research and Technology (IJERT-2014), Vol. 3, Issue 12, Dec. 2014.
174. Anjali C. Pise et. al., "Remote monitoring of Greenhouse parameters using zigbee Wireless Sensor Network", International Journal of Engineering Research & Technology ISSN 2278-0181 (online) Vol. 3, Issue 2, and pp: (2412-2414), Feb. 2014.
175. A. C. Pise, K. J. Karande, "Cluster Head Selection Based on ACO In Vehicular Ad-hoc Networks", Machine Learning for Environmental Monitoring in Wireless Sensor Networks



176. A. C. Pise, K. J. Karande, "Architecture, Characteristics, Applications and Challenges in Vehicular Ad Hoc Networks" Presented in 27th IEEE International Symposium on Wireless Personal Multimedia Communications (WPMC 2024) "Secure 6G – AI Nexus: Where Technology Meets Humanity" Accepted for book chapter to be published in international Scopus index book by River publisher.
177. A. C. Pise, Dr. K. J. Karande, "K-mean Energy Efficient Optimal Cluster Based Routing Protocol in Vehicular Ad Hoc Networks", International Conference on Innovations in Artificial Intelligence and Machine Learning (ICAIML-2022), August 20th and 21st 2022 Springer database Conference.
178. A. C. Pise, Mr. D. Nale, "Web-Based Application for Result Analysis", ", International Conference on Innovations in Artificial Intelligence and Machine Learning (ICAIML-2022), August 20th and 21st 2022 Springer database Conference.
179. A. C. Pise, et. al., "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.
180. A. C. Pise, et. al., "Facial Expression Recognition Using Facial Features," IEEE International Conference on Communication and Electronics Systems (ICCES 2018), October 2018.
181. A. C. Pise, et. al., "Estimating Parameters of Cast Iron Composition using Cooling Curve Analysis," IEEE International Conference on Communication and Electronics Systems (ICCES 2018), Coimbatore, October 2018.
182. A. C. Pise, et. al., "Android based portable Health Support System," International Conference on Innovations in Engineering and Technology (CIET 2016), SKN Sinhgad College of Engineering, 30-31 Dec 2016.
183. A. C. Pise, et. al., "Baysian Classifier & FCM Segmentation for Lung Cancer Detection in early stage," International Conference on Innovations in Engineering and Technology (CIET 2016), SKN Sinhgad College of Engineering, 30-31 Dec 2016.
184. A. C. Pise, et. al., "Cast Iron Composition Measurement by Coding Curve Analysis," International Conference on Innovations in Engineering and Technology (CIET 2016), SKN Sinhgad College of Engineering, 30-31 Dec 2016.
185. A. C. Pise, et. al., "War field Intelligence Defence Flaging Vehicle," International Conference on Innovations in Engineering and Technology (CIET 2016), SKN Sinhgad College of Engineering, 30-31 Dec 2016.
186. A. C. Pise, et. al. "Disease Detection of Pomegranate Plant", IEEE sponsored International Conference on Computation of Power, Energy, Information and Communication, 22- 23 Apr. 2015.
187. A. C. Pise, P. Bankar. "Face Recognition by using GABOR and LBP", IEEE International Conference on Communication and Signal Processing, ICCSP, 2-4 Apr. 2015
188. A. C. Pise, et. al. "Single Chip Solution For Multimode Robotic Control", Ist IEEE International Conferene on Computing Communication and Automation, 26-27 Feb2015.
189. Anjali C. Pise, Vaishali S. Katti, "Efficient Design for Monitoring of Greenhouse Parameters using Zigbee Wireless Sensor Network", fifth SARC international conference IRF,IEEE forum ISBN 978-93-84209-21-6,pp 24-26, 25th May 2014
190. A. C. Pise, P. Bankar, "Face Recognition using Color Local Texture Features", International Conference on Electronics and Telecommunication, Electrical and Computer Engineering, Apr.2014.
191. A. C. Pise, et.al. "Monitoring parameters of Greenhouse using Zigbee Wireless Sensor Network", 1st International Conference on Electronics and Telecommunication, Electrical and Computer Engineering, 5-6 Apr.2014.
192. A. C. Pise, et. al. "Compensation schemes and performance Analysis of IQ Imbalances in Direct Conversion Receivers", International Conference at GHPCOE, Gujarat, (Online Proceeding is Available), 2009.
193. A. C. Pise, K. J. Karande, "Energy-Efficient Optimal Routing Protocols in VANETs", 66th Annual IETE Convention, AIC -2023 September16-17, 2023, under the Theme: The Role of 5G In Enabling Digital Transformation for Rural Upliftment.



194. A. C. Pise, et. al. "Automatic Bottle Filling Machine using Raspberry Pi", National Conference on computer ;Communication & information Technology (NCCIT-2018) dated 30th & 31st March 2018.
195. A. C. Pise, et. al. "Design & Implementation of ALU using VHDL", National Conference on computer ;Communication & information Technology (NCCIT-2018) dated 30th & 31st March 2018.
196. A. C. Pise, et. al. "Mechanism and Control of Autonomus four rotor Quad copter", National Conference on Computer, Electrical and Electronics Engineering, 23- 24 Apr. 2016.
197. A. C. Pise, et. al. "Segmentation of Optic Disk and Optic Cup from retinal Images", ICEECMPE – Chennai, June 2015
198. A. C. Pise, et. al. "Diseases Detection of Pomegranate Plant", IEEE Sponsored International conference on Computation of Power, Energy , April 2015.
199. A. C. Pise, et. al. "Compensation Techniques for I/Q Imbalance in Direct-Conversion Receivers", Conference at SCOE, Pune 2010.
200. A. C. Pise, et. al. "I/Q Imbalance compensation Techniques in Direct Conversion Receiver ", Advancing Trends in Engineering and Management Technologies, ATEMT-2009, Conference at Shri Ramdeobaba Kamla Nehru Engineering College, Nagpur, 20-21 November 2009
201. A. C. Pise, et. al. "Compensation Techniques for I/Q Imbalance in Direct Conversion Receiver", Conference at PICT, Pune 2008.
202. A. C. Pise, et. al. "I/Q Imbalance compensation Techniques in Direct Conversion Receiver ", Conference at DYCOE, Pune 2008.
203. A. C. Pise, et. al. "DUCHA: A New Dual channel MAC protocol for Multihop Ad-Hoc Networks", Conference at SVCP, Pune 2007.
204. Godase, V., Pawar, P., Nagane, S., & Kumbhar, S. (2024). Automatic railway horn system using node MCU. *Journal of Control & Instrumentation*, 15(1).
205. 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.
206. Jamadade, V. K., Ghodke, M. G., Katakdhond, S. S., & Godase, V. A Comprehensive Review on Scalable Arduino Radar Platform for Real-time Object Detection and Mapping.
207. 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.
208. Godase, V. (2025, April). Advanced Neural Network Models for Optimal Energy Management in Microgrids with Integrated Electric Vehicles. In *Proceedings of the International Conference on Trends in Material Science and Inventive Materials (ICTMIM-2025) DVD Part Number: CFP250J1-DVD*.
209. Dange, R., Attar, E., Ghodake, P., & Godase, V. (2023). Smart agriculture automation using ESP8266 NodeMCU. *J. Electron. Comput. Netw. Appl. Math.*, (35), 1-9.
210. Godase, V. (2025). Optimized Algorithm for Face Recognition using Deepface and Multi-task Cascaded Convolutional Network (MTCNN). *Optimum Science Journal*.
211. Mane, V. G. A. L. K., & Gangonda, K. D. S. Pipeline Survey Robot.
212. 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.
213. Godase, V., & Jagadale, A. (2019). Three element control using PLC, PID & SCADA interface. *International Journal for Scientific Research & Development*, 7(2), 1105-1109.
214. 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.
215. Godase, V., Modi, S., Misal, V., & Kulkarni, S. (2025). LoRaEdge-ESP32 synergy: Revolutionizing farm weather data collection with low-power, long-range IoT. *Advance Research in Analog and Digital Communications*, 2(2), 1-11.



216. Godase, V. (2025). Comparative study of ladder logic and structured text programming for PLC. Available at SSRN 5383802.
217. Godase, V., Modi, S., Misal, V., & Kulkarni, S. Real-time object detection for autonomous drone navigation using YOLOv8. *Advance Research in Communication Engineering and its Innovations*, 2(2), 17-27.
218. Godase, V. (2025). Smart energy management in manufacturing plants using PLC and SCADA. *Advance Research in Power Electronics and Devices*, 2(2), 14-24.
219. 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*, 1(1), 9-19.
220. Godase, V. (2025). Graphene-Based Nano-Antennas for Terahertz Communication. *International Journal of Digital Electronics and Microprocessor Technology*, 1(2), 1-14.
221. 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.
222. 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.
223. Jamadade, V. K., Ghodke, M. G., Katakdhond, S. S., & Godase, V. A Comprehensive Review on Scalable Arduino Radar Platform for Real-time Object Detection and Mapping.
224. Godase, V. (2025). Cross-Domain Comparative Analysis of Microwave Imaging Systems for Medical Diagnostics and Industrial Testing. *Journal of Microwave Engineering & Technologies*, 12(2), 39-48p.
225. V. K. Jamadade, M. G. Ghodke, S. S. Katakdhond, and V. Godase, —A Review on Real-time Substation Feeder Power Line Monitoring and Auditing Systems,” *International Journal of Emerging IoT Technologies in Smart Electronics and Communication*, vol. 1, no. 2, pp. 1-16, Sep. 2025.
226. V. V. Godase, “VLSI-Integrated Energy Harvesting Architectures for Battery-Free IoT Edge Systems,” *Journal of Electronics Design and Technology*, vol. 2, no. 3, pp. 1-12, Sep. 2025.
227. A. Salunkhe et al., “A Review on Real-Time RFID-Based Smart Attendance Systems for Efficient Record Management,” *Advance Research in Analog and Digital Communications*, vol. 2, no. 2, pp.32-46, Aug. 2025.
228. 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), 41-47p.
229. Nagane, M.S., Pawar, M.P., & Godase, P.V. (2022). Cinematica Sentiment Analysis. *Journal of Image Processing and Intelligent Remote Sensing*.
230. Godase, V.V. (2025). Tools of Research. *SSRN Electronic Journal*.
231. Godase, V. (n.d.). EDUCATION AS EMPOWERMENT: THE KEY TO WOMEN’S SOCIO ECONOMIC DEVELOPMENT. *Women Empowerment and Development*, 174–179.
232. Godase, V. (n.d.). COMPREHENSIVE REVIEW ON EXPLAINABLE AI TO ADDRESSES THE BLACK BOX CHALLENGE AND ITS ROLE IN TRUSTWORTHY SYSTEMS. In *Sinhgad College of Engineering, Artificial Intelligence Education and Innovation* (pp. 127–132).
233. Godase, V. (n.d.-b). REVOLUTIONIZING HEALTHCARE DELIVERY WITH AI-POWERED DIAGNOSTICS: A COMPREHENSIVE REVIEW. In *SKN Sinhgad College of Engineering, SKN Sinhgad College of Engineering* (pp. 58–61).
234. Dhope, V. (2024). SMART PLANT MONITORING SYSTEM. In *International Journal of Creative Research Thoughts (IJCRT)*. <https://www.ijcrt.org>
235. M. M. Zade, Sushant D. Kambale, Shweta A. Mane, Prathamesh M. Jadhav. (2025) “IOT Based early fire detection in Jungles”. *RIGJA&AR Volume 2 Issue 1*, ISSN:2998-4459. DOI:<https://doi.org/10.5281/zenodo.15056435>
236. M. M. Zade, Bramhadev B. Rupanar, Vrushal S. Shilawant, Akansha R. Pawar (2025) “IOT Flood Monitoring & Alerting System using Raspberry Pi-Pico ” *International Journal of Research Publication & Reviews*, Volume 6, Issue 3, ISSN:2582-7421. DOI:<https://ijrpr.com/uploads/V6ISSUE3/IJRPR40251.pdf>



237. M.M.Zade(2022) "Touchless Fingerprint Recognition System"(Paper-ID 907)(2022) International Conference on "Advanced Technologies for Societal Applications: Techno-Societal 2022 <https://link.springer.com/book/10.1007/978-3-031-34644-6?page=6>
238. Mr.M.M.Zade published the paper on "Automation of Color Object Sorting Conveyor Belt", in International Journal of Scientific Research in Engineering & Management (IJSREM),ISSN:2582-3930 Volume 06 ,Issue 11th November 2022.
239. Mr.M.M.Zade published the paper on "Cloud Based Patient Health Record Tracking web Developement",in International Journal of Advanced Research in Science, Communication & Technology(IJARSCT),ISSN NO:2581-9429 Volume 02 ,Issue 03,DOI 1048175/IJARSCT-3705,IF 6.252, May 2022.
240. 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
241. 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
242. 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
243. 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
244. 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
245. 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
246. Mr. Mahesh M Zade & Mr.S.M.Karve,"Performance Analysis of Median Filter for Enhancement of Highly Corrupted Images", National Conference on Advanced Trends in Engineering, Association with IRJMS, Karmyogi Engineering College, Shelave, Pandharpur, March 2016.
247. Mr. Mahesh M Zade & Mr.S.M.Karve,"Implementation of Reed Solomen Encoder & Decoder Using FPGA",National Conference on Advanced Trends in Engineering, Association with IRJMS, Karmyogi Engineering College, Shelave, Pandharpur, March 2016.
248. Mr. Mahesh M Zade & Dr.S.M.Mukane,"Performance of Switching Median Filter for Enhancement of Image", National Conference on Mechatronics at Sinhgad Institute of Technology and Science, Narhe, Pune, Feb. 2016.
249. Mr. Mahesh M Zade & Dr.S.M.Mukane,"Enhancement of Image with the help of Switching Median Filter", National Conference on Emerging Trends in Electronics & Telecommunication Engineering, SVERI's College of Engineering Pandharpur, NCET 2013.
250. 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

