

Review on Integrated Tactical Patrolling Stick

Shridhar Pandhare¹, Samarth Mali², Karan Sahani³, Prof. A. H. Shinde⁴

^{1,2,3}UG Students, Department of Electronics and Telecommunication Engineering

⁴Assistant Professor, Department of Electronics and Telecommunication Engineering

SKN Sinhgad College of Engineering, Pandharpur

shridharpandhare4@gmail.com, samarthmali33@gmail.com,

karansahani7707@gmail.com, anita.shinde@sknscoe.ac.in,

Abstract: *The Integrated Tactical Patrol Stick (ITPS) is a multifunctional, field-ready tool designed to enhance the operational efficiency and safety of military personnel and forest officers in remote and high-risk environments such as border zones and dense forests. Initially developed with key functionalities including a high-intensity torch, laser module for long-range signaling, emergency buzzer system, stun gun circuit for self-defense, solar/DC charging support, and a battery capacity indicator, the ITPS integrates essential analog and electrical subsystems for power distribution, protection, and load control. A custom-designed 3S 18650 Li-ion battery pack ensures reliable power management, monitored through a dedicated indicator module.*

The project is now being extended into a more advanced embedded systems version that incorporates ESP32, GSM (SIM800L), and GPS (NEO-6M) modules. These enhancements enable real-time geo-fencing, SMS alert systems, and remote communication with control rooms, significantly boosting situational awareness, personnel tracking, and incident response capabilities. Embedded system planning is being implemented to ensure seamless integration of communication modules with the existing hardware infrastructure.

The ITPS thus represents a rugged, energy-efficient, and intelligent patrol solution combining analog robustness with modern embedded intelligence — ideal for mission-critical applications in challenging environments.

Keywords: Tactical patrol stick, embedded system, ESP32, GSM SIM800L, GPS NEO-6M, geo-fencing, SMS alert, forest and military patrol, self-defense tool, analog integration, power electronics, solar-powered device, Li-ion battery management

I. INTRODUCTION

The Integrated Tactical Patrol Stick (ITPS) is a multifunctional electronic tool developed to support security forces, forest officers, and military personnel operating in high-risk and remote environments such as dense forests, Naxal-affected areas, and border zones. This project was initiated as a solution to the real-world challenges faced during night and wilderness patrolling, where visibility, communication, safety, and power supply are critical concerns.

The initial prototype of ITPS features essential functions including a high-intensity LED torch for night visibility, a laser module for silent long-distance signaling, an emergency buzzer, a non-lethal stun gun circuit for self-defense, a solar/DC dual-mode charging system, and a battery capacity indicator. These modules are integrated into a 3-foot-long, lightweight, high-strength PVC body with a dedicated compartment for electronics, emphasizing portability and durability in rugged terrains.

The device's electrical design includes analog subsystems for power distribution, overload protection, and load control. A reliable 3S 18650 Li-ion battery pack with an indicator module ensures stable and long-lasting power supply, further supporting operations in off-grid areas.

To extend the device's capabilities, the project is currently being upgraded with embedded system technologies. This includes the integration of an ESP32 microcontroller, GSM module (SIM800L), and GPS module (NEO-6M). These additions aim to enable advanced features such as geo-fencing, real-time location tracking, SMS alert notifications, and



communication with control rooms. The embedded extension significantly enhances the ITPS by enabling situational awareness, remote monitoring, and digital communication, making it a smart tactical tool for modern security operations. This project not only demonstrates proficiency in circuit design, power electronics, analog system integration, and hardware testing, but also showcases the implementation of embedded systems to transition a manually operated tool into an intelligent, connected device for real-world tactical use.

II. LITERATURE SURVEY:

Several studies have explored the development of multifunctional tactical devices using embedded systems and integrated electronics.

Singh et al. [1] designed a handheld device combining LED torches and laser pointers to enhance night- time patrolling and silent communication among security personnel.

Kumar et al. [2] developed a solar-powered tactical device featuring emergency buzzer systems to improve distress signaling in remote areas.

Patil et al. [3] proposed a portable stun gun integrated with power management circuits to ensure reliable self-defense during border patrol operations.

Sharma et al. [4] introduced an ultrasonic animal repellent system that emits frequencies between 20– 40 kHz, effectively deterring wildlife in forest patrols.

Joshi et al. [5] focused on optimizing power supply for tactical devices by integrating lithium-ion battery packs with solar and DC charging modules.

Reddy et al. [6] incorporated GPS and GSM modules into patrol equipment for real-time location tracking and remote SMS alerts, improving coordination between patrolling units and control centers. Verma et al. [7] demonstrated the use of ESP32 microcontrollers to manage multiple device functions while maintaining energy efficiency.

Gupta et al. [8] developed analog subsystems for power distribution and load control, ensuring device protection and reliable operation in harsh environments.

Singh and Mehta et al. [9] emphasized the importance of geo-fencing and digital communication to enhance situational awareness and rapid response in tactical operations. However, most existing devices address individual functionalities separately, lacking full integration into a single rugged system.

III. PROPOSED METHODOLOGY

The development of the Integrated Tactical Patrolling Stick follows a structured approach, combining embedded hardware, sensor technology, and communication modules to deliver a cost-effective and intelligent solution form personal safety and security. The methodology is divided into the following key stages:

1) System Overview

The Integrated Tactical Patrolling Stick is a low-cost, ESP32-based solution designed to enhance the safety of individuals, particularly security personnel and patrolling officers. The system integrates multiple modules such as GPS for real-time location tracking, GSM (SIM800L) for communication, OLED display for status updates, and push-button switches for emergency functions. It is also equipped with a torch, laser, and buzzer for tactical operations and alert notifications.

In case of emergencies, the stick allows the user to send their real-time location to predefined contacts through the GSM module, while the buzzer and LED provide immediate alerts. The OLED screen displays the operational status, ensuring ease of use. Powered by a rechargeable battery with a boost converter for stable operation, the system is portable, lightweight, and reliable.

This integrated design makes it highly suitable for defense, law enforcement, and personal security applications by ensuring quick response, situational awareness, and reduced dependency on external devices.



Block Diagram:

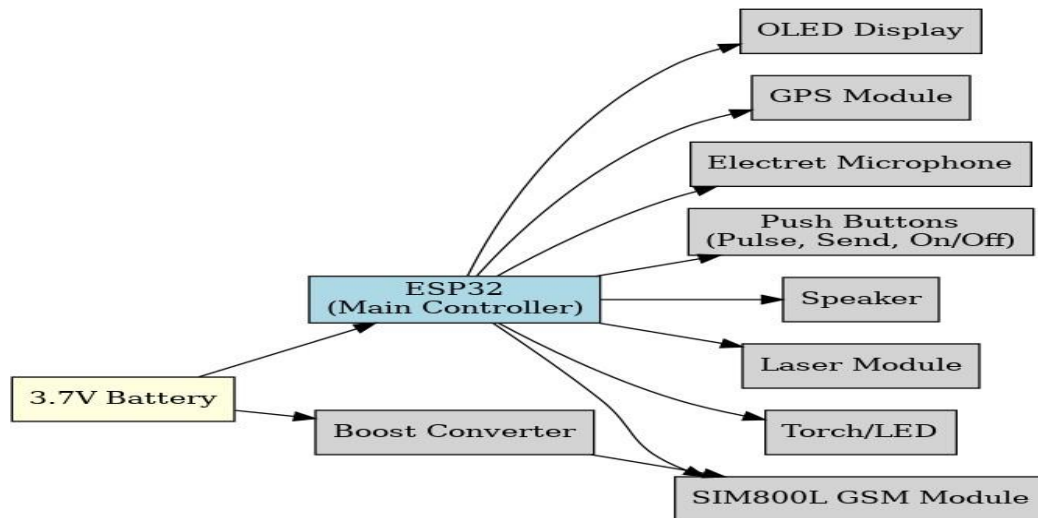


Fig 1: Block Diagram of System

1) ESP32:

The ESP32 is a dual-core microcontroller with built-in Wi-Fi and Bluetooth, ideal for IoT applications. It supports multiple digital and analog interfaces for easy integration with external components. The board can be programmed using the Arduino IDE or ESP-IDF, enabling flexible development

2) SIM800L:

The SIM800L is a compact GSM/GPRS module that allows microcontrollers to send SMS, make voice calls, and access mobile internet over a 2G network. It communicates via serial (UART) and operates on a voltage range of 3.7V to 4.2V, making it suitable for low-power embedded applications

3) GPS Receiver

A GPS receiver determines accurate location by receiving signals from satellites and communicates with microcontrollers via UART. Modules like NEO-6M are commonly used for real-time tracking and geo-fencing in embedded systems. It requires a clear sky view for reliable performance

4) Battery Management System:

A Battery Management System (BMS) ensures safe charging and discharging of batteries by protecting against overcharge, over-discharge, and overheating. It monitors battery health to extend lifespan and maintain optimal performance.

5) Batteries:

3S batteries consist of three lithium-ion cells connected in series, providing a combined voltage of around 11.1V (3.7V per cell). They offer higher voltage output suitable for powering devices that require more power. These batteries are commonly used in portable electronics, drones, and electric vehicles.

6) Buzzer:

A buzzer is an audio signalling device that produces sound to alert users of warnings or notifications. It operates using electrical signals and is commonly used in alarms and alert systems. Buzzers are simple, reliable components often integrated into safety and communication devices.

7) LED Module:

An LED module is a compact lighting component that emits bright light with low power consumption. It is widely used for indication, signalling, and illumination in electronic devices. LED modules are durable, energy-efficient, and available in various colours and sizes for different applications.



8) Laser Diode:

A laser diode is a semiconductor device that emits coherent, focused light used for precise signalling and targeting. It is commonly used in communication, measurement, and pointing applications

9) Buck controller:

A buck converter is a DC-DC power converter that steps down a higher voltage to a lower voltage efficiently. It uses switching components like transistors and inductors to regulate output voltage with minimal energy loss. Buck converters are widely used in battery-powered and embedded systems for stable voltage supply.

10) Solar Panel:

A solar panel is a device that converts sunlight into electrical energy using photovoltaic cells. It provides a renewable power source, especially useful in remote or off-grid locations. Solar panels are commonly used in embedded systems for charging batteries and supporting low-power devices.

11) High Voltage Generator:

A high voltage generator is an electronic circuit that converts low voltage DC into a much higher voltage output, typically used for applications like stun guns or ignition systems. It operates using components like transformers, oscillators, and capacitors to boost voltage efficiently. These generators are compact and effective for delivering non-lethal electric shocks in self-defence tools.

Software Components

- Arduino IDE – for writing, compiling, and uploading code to the Arduino board.
- Embedded C – for programming logic to control and monitor sensors and actuators

IV. CONCLUSION

The Integrated Tactical Patrol Stick (ITPS) is a compact, low-cost solution that enhances safety and efficiency for personnel in remote, high-risk areas. It combines key features like lighting, signalling, self-defence, and solar/DC charging with ESP32, GSM, and GPS for real-time tracking and communication. Designed for rugged use, it is well-suited for border patrol, forest security, and disaster response.

REFERENCES

1. R. S. Jadhav and M. K. Shinde, "Design and Implementation of a Multi-Functional Patrol Stick for Border and Forest Security," IJRASET, vol. 13, no. 5, May 2025.
2. A. P. Bhale and S. R. Pawar, "Smart Embedded System for Real-Time Location Tracking and Alerting Using GSM and GPS Modules," IJSREM, vol. 12, no. 4, April 2025
3. L. S. Patil and D. P. More, "Design of Portable Solar-Charged Devices for Field Personnel," IJSREM, vol. 6, no. 5, May 2023
4. H. R. Shinde and A. S. Wagh, "Embedded System Design for Personal Security and Environmental Monitoring," IJRESM, vol. 7, no. 1, Jan. 2023.
5. P. V. Kale and R. M. Deshmukh, "Low-Power Embedded Solutions for Field Surveillance Devices," IJRASET, vol. 10, no. 3, Mar. 2021.
6. G. W. Tjoa, A. Aribowo, and A. S. Putra, "Design of Automatic Emergency Alert Systems Using Embedded Technology," Proc. Int. Conf. New Media Studies (CONMEDIA), Oct. 2019, pp. 115.
7. H. B. Choukidar and N. A. Dawande, "Smart Patrol Device for Security Personnel: Design and Implementation," ICCUBE 2017.
8. N. R. Pawar and A. V. Dhage, "Wireless Sensor Network-Based Surveillance System for Remote Security," IJSR, vol. 8, no. 4, Apr. 2016.
9. A. D. Yadav, V. R. Bhagat, and S. P. Waghmare, "Embedded Automation Systems for Personal Safety Devices," IJRASET, vol. 3, no. 7, July 2015.
10. M. S. Bhat and M. Y. Bhat, "Real-Time Livestock Monitoring System Using Embedded Sensors," IJEAT, vol. 9, no. 3, Feb. 2014



11. V. S. Patil and S. S. Yadav, "Environmental Sensor Integration for Portable Security Devices," IJRESM, vol. 5, no. 6, June 2014.
12. S. R. More and D. V. Gawande, "Embedded Solutions for Remote Field Monitoring and Communication," IJRERD, vol. 4, no. 3, Mar. 2013.
13. Godase, M. V., Mulani, A., Ghodak, M. R., Birajdar, M. G., Takale, M. S., & Kolte, M. A MapReduce and Kalman Filter based Secure IIoT Environment in Hadoop. Sanshodhak, Volume 19, June 2024.
14. 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.
15. Gadade, B., Mulani, A. O., & Harale, A. D. IoT Based Smart School Bus and Student Tracking System. Sanshodhak, Volume 19, June 2024.
16. Dhanawadel, A., Mulani, A. O., & Pise, A. C. IOT based Smart farming using Agri BOT. Sanshodhak, Volume 20, June 2024.
17. Mulani, A., & Mane, P. B. (2016). DWT based robust invisible watermarking. Scholars' Press.
18. 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.
19. 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.
20. 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.
21. 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.
22. 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.
23. 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.
24. Nagane, U. P., & Mulani, A. O. (2021). Moving object detection and tracking using Matlab. Journal of Science and Technology, 6(1), 2456-5660.
25. 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.
26. Ghodake, M. R. G., & Mulani, M. A. (2016). Sensor based automatic drip irrigation system. Journal for Research, 2(02).
27. 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.
28. 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.
29. 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.
30. 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).
31. 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.
32. 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.



33. 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.
34. 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.
35. 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.
36. Mulani, A. O., & Shinde, G. N. (2021). An approach for robust digital image watermarking using DWT - PCA. Journal of Science and Technology, 6(1).
37. 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.
38. 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.
39. 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.
40. 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.
41. Takale, S., & Mulani, A. (2022). DWT-PCA based video watermarking. Journal of Electronics, Computer Networking and Applied Mathematics (JECNAM) ISSN, 2799-1156.
42. Kamble, A., & Mulani, A. O. (2022). Google assistant based device control. Int. J. of Aquatic Science, 13(1), 550-555.
43. 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.
44. 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.
45. 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.
46. 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.
47. 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.
48. Gadade, B., & Mulani, A. (2022). Automatic System for Car Health Monitoring. International Journal of Innovations in Engineering Research and Technology, 57-62.
49. 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.
50. 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.
51. 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.
52. 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.



53. 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.
54. Takale, S., & Mulani, D. A. (2022). Video Watermarking System. International Journal for Research in Applied Science & Engineering Technology (IJRASET), 10.
55. Mandwale, A., & Mulani, A. O. (2015, January). Different approaches for implementation of Viterbi decoder. In IEEE international conference on pervasive computing (ICPC).
56. 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.
57. 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.
58. Kambale, A. (2023). Home automation using google assistant. UGC care approved journal, 32(1), 1071-1077.
59. 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.
60. 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.
61. Mandwale, A., & Mulani, A. O. (2016). Implementation of High Speed Viterbi Decoder using FPGA. International Journal of Engineering Research & Technology, IJERT.
62. 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.
63. Shinde, R., & Mulani, A. O. (2015). Analysis of Biomedical Image || . International Journal on Recent & Innovative trend in technology (IJRITT).
64. Sawant, R. A., & Mulani, A. O. (2022). Automatic PCB Track Design Machine. International Journal of Innovative Science and Research Technology, 7(9).
65. 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).
66. Gadade, B., Mulani, A. O., & Harale, A. D. (2024). Iot based smart school bus and student monitoring system. Naturalista Campano, 28(1), 730-737.
67. 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.
68. Salunkhe, D. S. S., & Mulani, D. A. O. (2024). Solar Mount Design Using High-Density Polyethylene. NATURALISTA CAMPANO, 28(1).
69. 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.
70. 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.
71. 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.
72. 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.
73. Godse, A. P. A.O. Mulani (2009). Embedded Systems (First Edition).
74. 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.



75. 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.
76. 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.
77. 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.
78. 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).
79. 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.
80. Pol, D. R. S. (2021). Cloud Based Memory Efficient Biometric Attendance System Using Face Recognition. *Stochastic Modeling & Applications*, 25(2).
81. Nagtilak, M. A. G., Ulegaddi, M. S. N., Adat, M. A. S., & Mulani, A. O. (2021). Breast Cancer Prediction using Machine Learning.
82. Rahul, G. G., & Mulani, A. O. (2016). Microcontroller Based Drip Irrigation System.
83. 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.
84. Mulani, A., & Mane, P. B. (2016). DWT based robust invisible watermarking. *Scholars' Press*.
85. 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)*.
86. 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)*.
87. Altaf Osman Mulani, Electric Vehicle Parameters Estimation Using Web Portal, *Recent Trends in Electronics & Communication Systems*, Volume 10, Issue 3, 2023.
88. 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.
89. 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.
90. 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.
91. 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.
92. 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.



93. 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.
94. 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.
95. 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.
96. 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.
97. 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.
98. 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.
99. 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.
100. 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.
101. 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.
102. 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.
103. 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.
104. 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.
105. 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.
106. 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.
107. Karande, K. J., & Talbar, S. N. (2014). Independent component analysis of edge information for face recognition. Springer India.
108. Karande, K. J., & Talbar, S. N. (2008). Face recognition under variation of pose and illumination using independent component analysis. ICGST-GVIP, ISSN.
109. 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.
110. 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.



111. 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 its Applications (DICTAP) (pp. 99-103). IEEE.
112. 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>
113. 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.
114. <https://doi.org/10.15680/IJIRCCE.2018.0604036>
115. 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>
116. 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).
117. 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>
118. 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>
119. 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>.
120. 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.
121. 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.
122. 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.
123. 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.
124. 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.
125. 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.



126. 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 (ICCCSP 2018), 26th-27th Jan. 2018, organized by Dr. BATU, Lonere, India.
127. Siddheshwar Gangonda and Prachi Mukherji, "Speech Processing for Marathi Numeral Recognition", International Conference on Recent Trends, Feb 2012, IOK COE, Pune.
128. 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.
129. 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.
130. 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.
131. Siddheshwar Gangonda and Prachi Mukherji, "Speech Processing for Marathi Numeral Recognition", ePGCON 2011, 26th April 2011 organized by MAEER's MIT, Kothrud, Pune-38.
132. Siddheshwar Gangonda, "Medical Image Processing", Aavishkar-2K7, 17th and 18th March 2007 organized by Department of Electronics and Telecommunication Engineering, SVERI's COE, Pandharpur.
133. Siddheshwar Gangonda, "Image enhancement & Denoising", VISION 2k7, 28th Feb-2nd March 2007 organized by M.T.E. Society's Walchand College of Engineering, Sangli.
134. Siddheshwar Gangonda, "Electromagnetic interference & compatibility" KSHITIJ 2k6, 23rd and 24th Sept. 2006 organized by Department of Mechanical Engineering, SVERI's COE, Pandharpur.
135. 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>
136. 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.
137. 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.
138. 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.
139. 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.
140. 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.
141. 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.
142. A. C. Pise, et. al., "Python Algorithm to Estimate Range of Electrical Vehicle", Web of Science, Vol 21, No 1 (2022) December 2022
143. 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/ijitc.21.30.43, (2022).
144. 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.



- 145.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
- 146.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.
- 147.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.
- 148.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.
- 149.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
- 150.A. C. Pise, et. al., "Adaptive Noise Cancellation in Speech Signal", International Journal of Innovative Engg and Technology, 2017
- 151.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
- 152.A. C. Pise, et. al., "Review on Agricultural Plant Diseases Detection by Image Processing", ISSN 2278-62IX, IJLTET, Vol 7, Issue 1 May 2016
- 153.A. C. Pise, et. al. "Segmentation of Retinal Images for Glaucoma Detection", International Journal of Engineering Research and Technology (06, June-2015).
- 154.A. C. Pise, et. al. "Color Local Texture Features Based Face Recognition", International Journal of Innovations in Engineering and Technology(IJiet) , Dec. 2014
- 155.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.
- 156.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.
- 157.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
- 158.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.
- 159.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.
- 160.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.
- 161.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.
- 162.A. C. Pise, et. al., "Facial Expression Recognition Using Facial Features," IEEE International Conference on Communication and Electronics Systems (ICCES 2018), October 2018.
- 163.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.



- 164.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.
- 165.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.
- 166.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.
- 167.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.
- 168.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.
- 169.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
- 170.A. C. Pise, et. al. "Single Chip Solution For Multimode Robotic Control", Ist IEEE International Conferene on Computing Communication and Automation, 26-27 Feb2015.
- 171.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
- 172.A. C. Pise, P. Bankar, "Face Recognition using Color Local Texture Features", International Conference on Electronics and Telecommunication, Electrical and Computer Engineering, Apr.2014.
- 173.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.
- 174.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.
- 175.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.
- 176.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.
- 177.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.
- 178.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.
- 179.A. C. Pise, et. al. "Segmentation of Optic Disk and Optic Cup from retinal Images", ICEECMPE – Chennai, June 2015
- 180.A. C. Pise, et. al. "Diseases Detection of Pomegranate Plant", IEEE Sponsored International conference on Computation of Power, Energy , April 2015.
- 181.A. C. Pise, et. al. "Compensation Techniques for I/Q Imbalance in Direct-Conversion Receivers", Conference at SCOE, Pune 2010.
- 182.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
- 183.A. C. Pise, et. al. "Compensation Techniques for I/Q Imbalance in Direct Conversion Receiver", Conference at PICT, Pune 2008.
- 184.A. C. Pise, et. al. "I/Q Imbalance compensation Techniques in Direct Conversion Receiver ", Conference at DYCOE, Pune 2008.



185. A. C. Pise, et. al. "DUCHA: A New Dual channel MAC protocol for Multihop Ad-Hoc Networks", Conference at SVCP, Pune 2007.
186. Godase, V., Pawar, P., Nagane, S., & Kumbhar, S. (2024). Automatic railway horn system using node MCU. *Journal of Control & Instrumentation*, 15(1).
187. 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.
188. 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.
189. 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.
190. 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*.
191. Dange, R., Attar, E., Ghodake, P., & Godase, V. (2023). Smart agriculture automation using ESP8266 NodeMCU. *J. Electron. Comput. Netw. Appl. Math*, (35), 1-9.
192. Godase, V. (2025). Optimized Algorithm for Face Recognition using Deepface and Multi-task Cascaded Convolutional Network (MTCNN). *Optimum Science Journal*.
193. Mane, V. G. A. L. K., & Gangonda, K. D. S. Pipeline Survey Robot.
194. 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.
195. Godase, V., & Jagadale, A. (2019). Three element control using PLC, PID & SCADA interface. *International Journal for Scientific Research & Development*, 7(2), 1105-1109.
196. 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.
197. 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.
198. Godase, V. (2025). Comparative study of ladder logic and structured text programming for PLC. Available at SSRN 5383802.
199. 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.
200. Godase, V. (2025). Smart energy management in manufacturing plants using PLC and SCADA. *Advance Research in Power Electronics and Devices*, 2(2), 14-24.
201. 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.
202. Godase, V. (2025). Graphene-Based Nano-Antennas for Terahertz Communication. *International Journal of Digital Electronics and Microprocessor Technology*, 1(2), 1-14.
203. 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.
204. 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.
205. 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.



206. 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.
207. 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.
208. 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.
209. 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.
210. 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.
211. Nagane, M.S., Pawar, M.P., & Godase, P.V. (2022). Cinematica Sentiment Analysis. *Journal of Image Processing and Intelligent Remote Sensing*.
212. Godase, V.V. (2025). Tools of Research. *SSRN Electronic Journal*.
213. Godase, V. (n.d.). EDUCATION AS EMPOWERMENT: THE KEY TO WOMEN’S SOCIO ECONOMIC DEVELOPMENT. *Women Empowerment and Development*, 174–179.
214. 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).
215. 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).
216. Dhope, V. (2024). SMART PLANT MONITORING SYSTEM. In *International Journal of Creative Research Thoughts (IJCRT)*. <https://www.ijert.org>
217. 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>
218. 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>
219. 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>
220. 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.
221. Mr. M.M. Zade published the paper on “Cloud Based Patient Health Record Tracking web Development”, 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.
222. 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
223. 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
224. 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
225. 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



- 226.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
- 227.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
- 228.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.
- 229.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.
- 230.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.
- 231.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.
- 232.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.

