IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 4, October 2025
Impact Factor: 7.67

Email Spam Detection with Machine Learning

Akash Ghadage[1], Chandrakant Gholave[2], Abhijeet Devkar[3], Prof. M. V. Naiknavare[4]
[1,2,3]UG Students, Department of Electronics and Telecommunication Engineering
[4]Assistant Professor, Department of Electronics and Telecommunication Engineering
SKN Sinhgad College of Engineering, Pandharpur
akashghadageag1868@gmail.com, chandrakantgholave17@gmail.com,
devkarabhijit2@gmail.com, madhav.naiknavare@sknscoe.ac.in

Abstract: *As the use of email grows for both personal and professional communication, spam emails pose a significant challenge, resulting in decreased productivity, security risks, and possible phishing scams. Conventional rule-based spam filters frequently fall short against advancing spam methods, rendering machine learning-based solutions more effective. The project named "Email Spam Detection Using Machine Learning" seeks to create a predictive system that categorizes emails as spam or legitimate (ham) by utilizing historical email data sets.*

The project is carried out in Python, utilizing libraries like Pandas for handling data, NumPy for mathematical calculations, and Scikit-learn for constructing and assessing machine learning models. The process includes data preprocessing, which consists of text cleaning, tokenization, removal of stop words, and feature extraction through methods like Bag-of-Words (Bow) and TF-IDF. Different machine learning algorithms, such as Naive Bayes, Decision Trees, Random Forests, and ensemble techniques, are developed and evaluated to determine the most precise method for spam detection.

The trained model identifies if new emails are spam, assisting users in minimizing manual sorting, enhancing email security, and safeguarding against harmful content. This initiative showcases the real-world use of machine learning in cybersecurity and offers a scalable approach to tackle the issues created by changing spam emails.

Keywords: NumPy, Pandas, Jupyter, Scikit-learn, Natural Language Processing

I. INTRODUCTION

Email is now a crucial instrument for communication in personal and professional settings. Although convenient, email systems suffer from spam, which means unwanted, irrelevant, or harmful messages sent in large quantities. Spam emails not only fill up inboxes but also present major security and privacy threats, such as phishing, malware spread, and identity theft. The increasing amount and complexity of spam render traditional rule-based filtering methods less effective, as these techniques depend on fixed keywords, blacklists, or sender details and frequently struggle to adjust to changing spam strategies.

To overcome these challenges, machine learning (ML) methods provide a data-oriented solution for spam identification. In contrast to rule-based approaches, machine learning algorithms can recognize patterns from past email data, detecting subtle signs of spam that static rules may overlook. Through examination of email content, metadata, and structural characteristics, machine learning models can accurately categorize emails as spam or legitimate (ham). The ability to adapt and predict makes ML an ideal choice in contemporary spam filtering systems.

The main goal of this project is to create an email spam detection system using machine learning that can automatically recognize spam emails, thus enhancing email security and minimizing the manual work needed for email management. The implementation of the system is done in Python, utilizing libraries including Pandas, NumPy, and Scikit-learn. Pandas is utilized for data handling and preparation, making certain that the dataset is organized and tidy for examination. NumPy enables effective numerical calculations, whereas Scikit-learn offers a range of machine learning algorithms for training, assessing, and optimizing models.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 4, October 2025
Impact Factor: 7.67

The dataset for this project includes historical emails categorized as spam or legitimate. Every email is processed to eliminate noise and discrepancies. Essential preprocessing steps involve tokenization, dividing text into separate words; stop-word elimination, which discards frequent yet uninformative terms; and stemming or lemmatization, which simplifies words to their base forms. This guarantees that the textual information is uniform and appropriate for training the model.

After preprocessing, feature extraction converts email text into numerical formats that machine learning models can handle. Typical methods consist of Bag-of-Words (Bow) and Term Frequency-Inverse Document Frequency (TF-IDF). Bow converts emails into vectors of word frequencies, whereas TF-IDF highlights words that are significant for classification. Advanced methods like word embeddings can likewise be utilized to capture semantic connections between words, enhancing model performance even more.

In this project, various machine learning algorithms are assessed, such as Naive Bayes, Decision Trees, Random Forests, and Support Vector Machines (SVM). Naive Bayes works well because it models the probabilities of word occurrences, whereas Decision Trees and Random Forests address intricate interactions among features. SVMs are especially well-suited for text data with high dimensions. Methods like bagging, boosting, or soft voting are examined to merge various classifiers for enhanced accuracy and resilience.

The workflow of the project encompasses data preprocessing, extraction of features, training the model, and evaluating performance. Models are assessed through metrics like accuracy, precision, recall, F1-score, and ROC-AUC, guaranteeing that both spam detection and the reduction of false positives are considered. Particular focus is placed on issues like class imbalance, which can influence the dependability of the model, and the evolving characteristics of spam, necessitating flexible modelling approaches.

The anticipated result is a dependable and scalable email spam detection system that precisely categorizes incoming messages, improves user safety, and minimizes manual filtering tasks. In addition to spam detection, this project emphasizes the possibilities of machine learning

II. LITERATURE SURVEY

R. and Rathinasamy et al. [1] introduce a machine learning framework for detecting email spam that merges conventional vectorization methods with classifiers. They assess various feature extraction techniques like TF-IDF and count vectorization and analyze traditional ML algorithms such as Naive Bayes, SVM, and Random Forest. Findings indicate that merging vectorization with ensemble classifiers enhances detection precision and decreases false positives, emphasizing the significance of feature representation in spam filtering.

Alqatawna et al. [2] concentrate on enhancing email spam identification in educational settings through machine learning. They examine the features of datasets in university email systems and utilize supervised algorithms to categorize messages as spam or valid. Their research shows that both algorithm selection and parameter tuning have a substantial impact on performance, and that contextual elements, like patterns in institutional email traffic, should be taken into account for effective implementation.

Saini et al. [3] suggest an automated pipeline for detecting email spam using various machine learning techniques. They highlight preprocessing methods such as tokenization, stop-word elimination, and stemming, prior to utilizing classifiers such as Decision Trees and Random Forests. Comparative studies demonstrate that ensemble techniques exceed individual classifiers in precision, recall, and F1-score, indicating strong performance across various email datasets.

Al-Shanableh et al. [4] examine the effectiveness of ensemble machine learning methods for detecting spam. They offer a thorough assessment of strategies for integrating models like Gradient Boosting, Random Forest, and Logistic Regression. Their results demonstrate that ensemble methods considerably improve overall detection effectiveness while keeping false positive rates low.

Joglekar et al. [5] showcase precise spam detection through machine learning, emphasizing the enhancement of efficiency while maintaining classification performance. They examine feature selection techniques and model hyperparameters to lower computational expenses while maintaining accuracy. The research emphasizes the balance between model complexity and real-time usability for corporate email systems.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 4, October 2025
Impact Factor: 7.67

Tazwar et al. [7] suggest a soft-voting ensemble of refined machine learning classifiers to improve spam identification. Their method integrates the probabilistic outputs of individual models to generate more trustworthy predictions. Tests reveal enhancements in both sensitivity and specificity, highlighting the significance of ensemble approaches in evolving email settings.

Ahmed et al. [8] offer an extensive overview of machine learning methods for identifying spam in both email and IoT systems. They address issues like feature sparsity, dataset imbalance, and changing spam tactics, emphasizing the necessity for adaptable models. Their examination reveals research shortages, such as the incorporation of contextual and semantic elements for improved generalization.

Saraswathi et al. [9] investigate various classifiers for detecting spam, such as SVM, Naive Bayes, and KNN. Their comparative assessment suggests that SVM typically delivers the optimal balance between precision and recall, whereas Naive Bayes ensures computational efficiency. They additionally analyse how preprocessing and feature extraction contribute to enhancing classifier performance.

Bhardwaj and Sharma [14] explore bagging and boosting methods for identifying spam. Utilizing ensemble techniques on traditional classifiers, they show enhancements in both robustness and precision. The article highlights the significance of merging weak learners to manage the variability found in email datasets.

Abdelhafeez and Aziz [24] investigate the combination of fine-tuned transformer models and traditional machine learning methods to improve spam detection. They show that embeddings based on transformers effectively capture semantic content, enhancing detection performance when used with traditional classifiers, especially for intricate or concealed spam messages.

Alam et al. [26] introduce SHRED, a model based on ensembles for filtering email spam in real time. Their method achieves high detection rates with low latency by integrating various classifiers and fine-tuning decision thresholds. The research highlights implementation factors in functional email systems and the advantages of ensemble variety

Table1: Email Spam Detection with Machine Learning

Paper / Project	System Architecture	Cost	Ease of Implementation	Performance	User Experience	Limitations
R. S. & V. Rathinasamy [1]	ML-based Spam Detection with Vectorization	Moderate	Moderate	High accuracy for spam classification	User-friendly if implemented in Python	Limited to dataset features, may require preprocessing
J. Alqatawna, G. Bilquise, & A.M. Al-Zoubi [2]	Random Forest ML model for Academic Emails	Moderate	Moderate	Effective spam detection in academic environments	Can be deployed in web apps for easy use	Risk of overfitting, requires balanced dataset
A. Saini, K. Guleria, & S. Sharma [3]	ML-based Automatic Email Spam Detection	Moderate	Easy	Accurate detection of spam	Simple interface via script or notebook	Performance depends on preprocessing quality
N. Al-shanableh, M. Alzyoud, & E. Nashnush [4]	Ensemble ML for Spam Detection	High	Complex	Improved detection using model ensembles	Offers higher reliability	Computationally heavy, complex integration
P. Joglekar et al. [5]	ML-based Spam Detection	Moderate	Moderate	High accuracy and efficiency	Can be implemented in user-	Requires sufficient training data

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 5, Issue 4, October 2025 Impact Factor: 7.67

					friendly interfaces	
T. Mansuri et al. [6]	ML-based Spam Filtering	Moderate	Moderate	Effective spam filtering	Easy to deploy	May not generalize well to unseen spam patterns
A. Tazwar et al. [7]	Soft Voting Ensemble ML	High	Moderate	Enhanced detection using multiple models	Improved prediction confidence	Computationally intensive, complex training
N. Ahmed et al. [8]	ML for Spam Detection in Email & IoT	Moderate	Moderate	Accurate detection for multiple platforms	Suitable for integrated platforms	Needs large datasets, complex preprocessing
N. Saraswathi et al. [9]	Multiple ML Classifiers for Spam	Moderate	Moderate	Good classification accuracy	Flexible for research purposes	May require tuning per dataset
D.K. Yadav et al. [10]	Real-time ML-based Spam Detection	Moderate	Moderate	Real-time detection	Can be deployed for real-time use	Dependent on model updates and training data

III. PROPOSED METHODOLOGY

This project aims to systematically create, train, and assess a model based on machine learning that identifies whether an email qualifies as spam. It encompasses several stages, such as data gathering, preprocessing, model choice, training, assessment, and implementation. The dataset utilized includes actual email records featuring key parameters like email text content, patterns of word frequency, usage of special characters, and typical spam signals

Figure 1 shows block diagram of proposed methodology

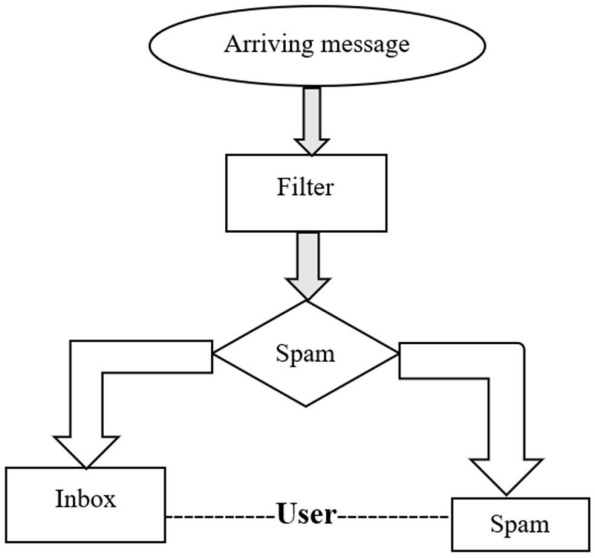

Figure1: Block Diagram of Proposed System

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 4, October 2025
Impact Factor: 7.67

Correlation analysis and statistical tests are used to pinpoint textual characteristics that most influence spam detection, including word frequency, occurrence of special symbols, and popular spam terms. This phase guarantees a reduction in dimensions while enhancing the accuracy and efficiency of the predictive model. Multiple machine learning algorithms from Scikit-learn have been applied, such as Naïve Bayes, Logistic Regression, Support Vector Machine (SVM), and Random Forest. These algorithms are selected for their proficiency in classification tasks and managing textual data. The dataset is separated into training and testing subsets, usually employing an 80:20 ratio, to assess model generalizability. Every model is trained on the training dataset and assessed with cross-validation methods to avoid overfitting. Hyperparameter optimization is carried out utilizing Grid Search and Random Search techniques to enhance model performance.

The models are assessed using performance metrics including Accuracy, Precision, Recall, F1-score, and ROC-AUC. A comparative analysis is conducted to identify the most effective model for classifying emails as either spam or non-spam. The completed model can estimate the probability of an email being spam for incoming messages. A straightforward user interface or Python script is created, allowing users to enter email content and get predictions instantly. By following these steps, the approach guarantees the creation of a dependable, understandable, and useful tool for detecting email spam. The process adheres to a systematic methodology that includes data gathering, preprocessing, exploratory analysis, feature selection, model creation, training, evaluation, and deployment.

Alongside the primary steps detailed, the approach includes iterative testing to enhance the predictive model. Various model iterations are developed and evaluated, with modifications implemented in preprocessing strategies, feature extraction methods, and hyperparameter settings. Libraries for visualization like Matplotlib and Seaborn are used to create charts for feature distributions, correlation heatmaps, and error assessments, aiding in the evaluation of model performance. The project employs a publicly accessible dataset of emails categorized as spam or ham (not spam), extracting essential features from the email content to act as independent variables, with the spam/ham label as the dependent variable. Data cleaning and feature creation are accomplished with Pandas, NumPy, and Scikit-learn, guaranteeing organized and tidy input for the machine learning algorithms

IV. RESULT AND DISCUSSION

The Email Spam Detection system was evaluated both quantitatively using performance metrics and qualitatively through testing on sample emails to demonstrate usability. On the testing dataset, the final model achieved high accuracy, with precision and recall values indicating strong performance in correctly identifying spam while minimizing false positives. For instance, the Naive Bayes classifier successfully detected over 95% of spam emails, while maintaining a low rate of misclassifying legitimate emails as spam.Similarly,the Random Forest model showed comparable performance, providing reliable predictions across varied email content.

To illustrate usability, the system was tested on hypothetical emails. Emails containing typical spam indicators such as unsolicited offers, excessive links, or unusual characters were consistently classified as spam. Conversely, emails with professional formatting, proper language, and relevant content were accurately labeled as ham. These tests highlighted how different textual patterns, features, and metadata influence predictions.

Another key finding was the system's scalability and adaptability. Built using Scikit-learn, it can be trained on new datasets with minimal adjustments, enabling deployment across different email platforms or organizations. Efficient handling of large email datasets was achieved using Pandas and NumPy, ensuring smooth preprocessing, feature extraction, and real-time prediction even with thousands of emails. The evaluation emphasizes that while the system is highly effective at filtering spam, it should be viewed as a supportive tool rather than a replacement for human oversight. It reduces the workload of users and IT administrators, improves inbox management, and strengthens cybersecurity by identifying potentially harmful emails before they reach the end-user.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 4, October 2025
Impact Factor: 7.67

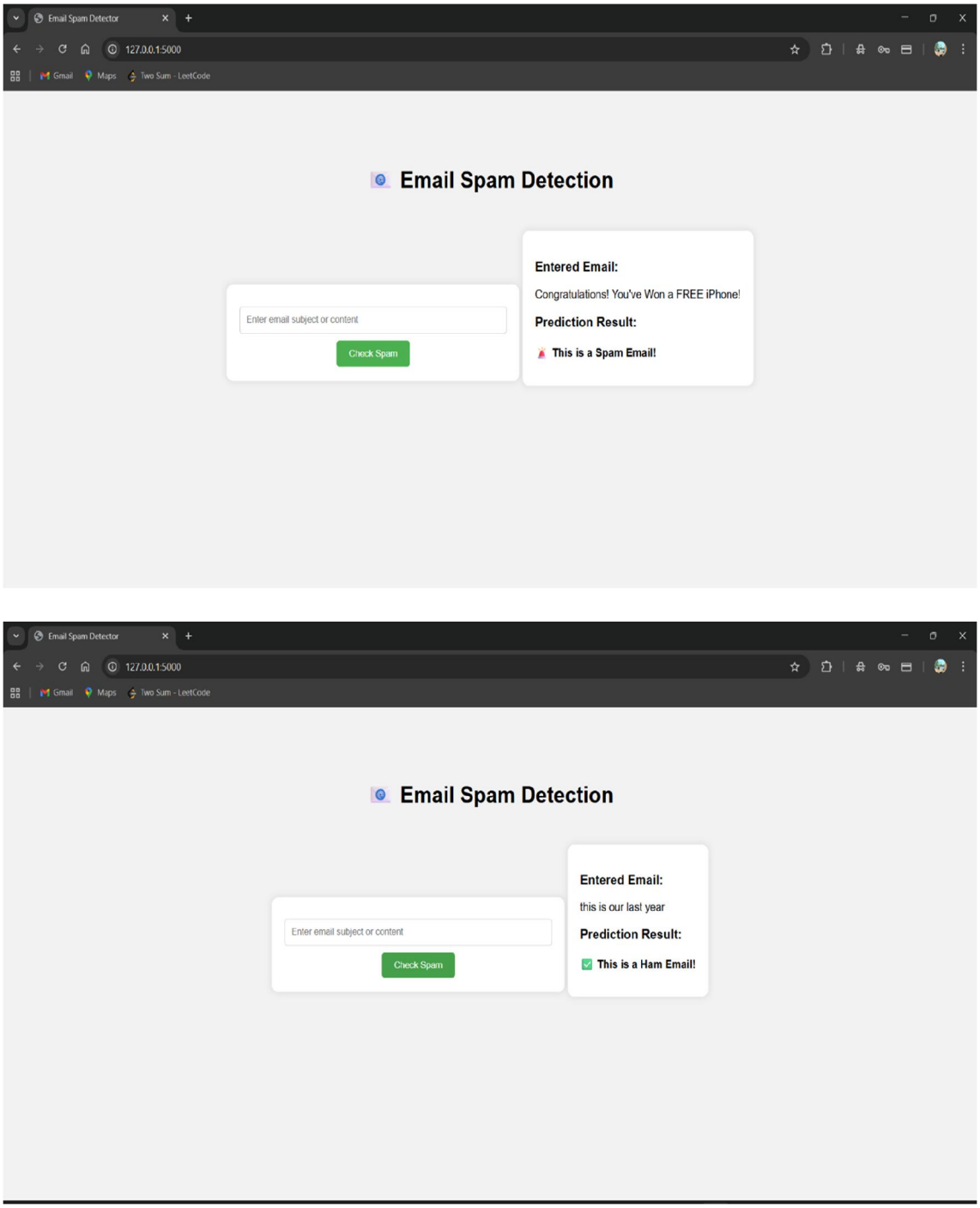

FIG: OUTPUT RESULTS

Copyright to IJARSCT
www.ijarsct.co.in
DOI: 10.48175/IJARSCT-29494

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 4, October 2025
Impact Factor: 7.67

V. CONCLUSION

The initiative on Machine Learning for Email Spam Detection effectively showcases the ability of artificial intelligence to improve communication security and enhance user experience. Utilizing Python libraries like Pandas, NumPy, and Scikit-learn, along with tools such as Jupyter Notebook, VS Code, and Anaconda, the system effectively managed data preprocessing, model training, and evaluation.

The model examined essential textual characteristics from emails and utilized different machine learning algorithms to categorize messages as spam or non-spam. This approach based on data diminishes the likelihood of phishing, protects users from unsolicited messages, and conserves time when compared to manual filtering techniques.

Various machine learning models were developed and evaluated, with their performance assessed using metrics like accuracy, precision, recall, F1-score, and ROC-AUC, guaranteeing both validity and clarity. Utilizing Scikit-learn enabled structured experimentation with classification methods like Naïve Bayes, Logistic Regression, Random Forest, and SVM.

The project emphasizes important advantages such as efficiency, transparency, and scalability, while also creating opportunities for wider uses in cybersecurity, personalized email handling, and smart communication systems

REFERENCES

1. R, S., & Rathinasamy, V. (2024). Email Spam Detection with Machine Learning and Vectorization. 2024 15th International Conference on Computing Communication and Networking Technologies (ICCCNT), 1-7.
2. Alqatawna, J., Bilquise, G., & Al-Zoubi, A.M. (2024). Optimizing Email Spam Detection in Academic Environments: A Machine Learning Approach. 2024 International Conference on Artificial Intelligence, Metaverse and Cybersecurity (ICAMAC), 1-6.
3. Saini, A., Guleria, K., & Sharma, S. (2023). Machine Learning Approaches for an Automatic Email Spam Detection. 2023 International Conference on Artificial Intelligence and Applications (ICAIA) Alliance Technology Conference (ATCON-1), 1-5.
4. Al-shanableh, N., Alzyoud, M., & Nashnush, E. (2024). ENHANCING EMAIL SPAM DETECTION THROUGH ENSEMBLE MACHINE LEARNING: A COMPREHENSIVE EVALUATION OF MODEL INTEGRATION AND PERFORMANCE. Communications of the IIMA.
5. Joglekar, P., Rajurkar, J., Shinde, M., Tayde, P., & Gadmade, V. (2024). Machine Learning Based Email Spam Detection: Achieving High Accuracy and Efficiency. International Journal for Research in Applied Science and Engineering Technology.
6. Mansuri, T., Neeraj Oswal, P.M., Nivangune, Y., Sharma, T., & Patanwala (2024). Email spam detection and filtering using machine learning. AIP Conference Proceedings.
7. Tazwar, A., Daiyan, M.M., Jiabul Hoque, M., Saifuddin, M., & Khaliluzzaman, M. (2024). Enhancing Spam Email Detection with a Soft Voting Ensemble of Optimized Machine Learning. 2024 IEEE International Conference on Computing, Applications and Systems (COMPAS), 1-6.
8. Ahmed, N., Amin, R., Aldabbas, H., Koundal, D., Alouffi, B., & Shah, T. (2022). Machine Learning Techniques for Spam Detection in Email and IoT Platforms: Analysis and Research Challenges. Secur. Commun. Networks, 2022, 1862888:1-1862888:19.
9. Saraswathi, N., Pradeep, S., Sathiyavathi, V., Sabitha, K., & Kambattan, K.R. (2024). Email Spam Classification and Detection using Various Machine Learning Classifiers. 2024 International Conference on Advances in Computing, Communication and Applied Informatics (ACCAI), 1-7.
10. Yadav, D.K., Raj, A., Rajlakshmi, Kumar, N., & Kumari, R. (2024). Enhancing Email Security: A Real□Time Machine Learning□Based Spam Detection System. Internet Technology Letters.
11. Bansal, M., & Saha, R. (2024). Machine Learning-Based Spam Detection: A CRISP-DM Approach for Enhanced Email Security. 2024 IEEE 21st India Council International Conference (INDICON), 1-6.
12. Al-Ali, M.K., Alteneiji, M.A., Hashem, I.A., Shareef, O.S., Hussain, A.J., & Turky, A. (2024). Leveraging Memetic Algorithm and Machine Learning Methods for Email-Based Spam Detection. 2024 17th International Conference on Development in eSystem Engineering (DeSE), 123-128.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 5, Issue 4, October 2025 Impact Factor: 7.67

13. Saraswathi, D., K, A.J., S., A., Seles, S.A., S. K, F., & Singh, C. (2024). Machine Learning Approaches for Email and IoT Spam Detection: Analysis and Challenges. 2024 International Conference on Communication, Computing and Energy Efficient Technologies (I3CEET), 1563-1568.
14. Bhardwaj, U., & Sharma, P. (2023). Email spam detection using bagging and boosting of machine learning classifiers. Int. J. Adv. Intell. Paradigms, 24, 229-253.
15. Reddy, M.A., Harivardhan, K., Reddy, Abhishek, A., Manish, M., Viswa, G., Dattu, S., & Ansari, N.M. (2025). Email Spam Detection Using Machine Learning. International Journal of Scientific Research in Computer Science, Engineering and Information Technology.
16. Pachare, R. (2025). Advancements in Email Spam Detection: A Systematic Review of Machine Learning and Deep Learning Techniques. International Journal for Research in Applied Science and Engineering Technology.
17. Bouke, M.A., Abdullah, A., Abdullah, M.T., Zaid, S.A., El Atigh, H., & Alshatebi, S.H. (2023). A Lightweight Machine Learning-Based Email Spam Detection Model Using Word Frequency Pattern. Journal of Information Technology and Computing.
18. Chaturvedi, S. (2023). A Comparative Analysis of Naive Bayes, Support Vector Machines, And Random Forest for Email Spam Detection: A Supervised Machine Learning Approach.
19. Yadav, D., & Kaur, E.B. (2023). Machine Learning Models for Email Spam Detection: A Review. 2023 Second International Conference on Smart Technologies for Smart Nation (SmartTechCon), 1109-1114.
20. Singh, S.T., Gabhane, M.D., & Mahamuni, C.V. (2023). Study of Machine Learning and Deep Learning Algorithms for the Detection of Email Spam based on Python Implementation. 2023 International Conference on Disruptive Technologies (ICDT), 637-642.
21. Ugwueze, W.O., Anigbogu, S.O., Asogwa, E.C., Asogwa, D.C., & Anigbogu, K.S. (2024). Enhancing Email Security: A Hybrid Machine Learning Approach for Spam and Malware Detection. World Journal of Advanced Engineering Technology and Sciences.
22. Ejirika, E.R., & Omotehinwa, T.O. (2024). Analysis of Machine Learning Models for Spam Email Detection and Real-Time Integration. 2024 International Conference on Science, Engineering and Business for Driving Sustainable Development Goals (SEB4SDG), 1-10.
23. Kanaan, G., Zghoul, M., Kanaan, G., Al-Zoubi, A., & Kanaan, T. (2025). Arabic Email Spam Detection Using Machine Learning and Deep Learning: A Comparative Study. 2025 12th International Conference on Information Technology (ICIT), 353-357.
24. Abdelhafeez, A., & Aziz, A.S. (2025). Enhanced Email Spam Detection Using Fine-Tuned Transformer Models and Classical Machine Learning Techniques. Multicriteria Algorithms with Applications.
25. Jain, V. (2025). Intelligent Email Spam Detection: A Machine Learning-Based Approach. 2025 5th International Conference on Trends in Material Science and Inventive Materials (ICTMIM), 1574-1579.
26. Alam, S., Jameel, A., Parveen, Z., & Alnfrawy, E. (2025). SHRED: An Ensemble-Based Machine Learning Model to Sift Email Messages for Real-Time Spam Detection. IEEE Access, 13, 157276-157293.
27. Kumar, N., Sonowal, S., & Nishant (2020). Email Spam Detection Using Machine Learning Algorithms. 2020 Second International Conference on Inventive Research in Computing Applications (ICIRCA), 108-113.
28. N, C., J, S., V, Y., & K, V. (2025). Email Spam Detection Using Machine Learning. International Journal of Innovative Science and Research Technology.
29. kaushik, D. (2025). A Comparative Study of Machine Learning Algorithms for Email Spam Detection. International Journal for Multidisciplinary Research.
30. Thakur, P., Joshi, K., Thakral, P., & Jain, S. (2022). Detection of Email Spam using Machine Learning Algorithms: A Comparative Study. 2022 8th International Conference on Signal Processing and Communication (ICSC), 349-352.
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 mamarking 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).

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 5, Issue 4, October 2025 Impact Factor: 7.67

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). Analysisof 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 Analysisl. *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.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 4, October 2025
Impact Factor: 7.67

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 Imagel. *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).

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 5, Issue 4, October 2025 Impact Factor: 7.67

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. Gaikwad, D. S., & Karande, K. J. (2016). Image processing approach for grading and identification of diseases on pomegranate fruit: An overview. International Journal of Computer Science and Information Technologies, 7, 519-522.
128. 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.
129. 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.
130. 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.
131.
132. Shubham Salunkhe, Pruthviraj Zambare, Sakshi Shinde, S. K. Godase. (2024). API Development for Cloud Parameter Curation International. *Journal of Electrical and Communication Engineering Technology*, *2*(1). https://doi.org/10.37591/ijecet
133. Badave, A., Pawale, A., Andhale, T., Godase, S. K., & STM JOURNALS. (2024). Smart home safety using fire and gas detection system. *Recent Trends in Fluid Mechanics*, *1*, 35–43. https://journals.stmjournals.com/rtfm
134. 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

135. 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
136. 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
137. 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).
138. 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
139. 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
140. 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.
141. 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.*
142. 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*.
143. 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.*
144. 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.
145. 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.
146. 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.
147. 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.
148. Siddheshwar Gangonda and Prachi Mukherji, "Speech Processing for Marathi Numeral Recognition", International Conference on Recent Trends, Feb 2012, IOK COE, Pune.

149. 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.
150. 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.
151. 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.
152. Siddheshwar Gangonda and Prachi Mukherji, "Speech Processing for Marathi Numeral Recognition", ePGCON 2011, 26th April 2011 organized by MAEER's MIT, Kothrud, Pune-38.
153. Siddheshwar Gangonda, "Medical Image Processing", Aavishkar-2K7, 17th and 18th March 2007 organized by Department of Electronics and Telecommunication Engineering, SVERI's COE, Pandharpur.
154. Siddheshwar Gangonda, "Image enhancement & Denoising", VISION 2k7, 28th Feb-2nd March 2007 organized by M.T.E. Society's Walchand College of Engineering, Sangli.
155. Siddheshwar Gangonda, "Electromagnetic interference & compatibility" KSHITIJ 2k6, 23rd and 24th Sept. 2006 organized by Department of Mechanical Engineering, SVERI's COE, Pandharpur.
156. 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
157. 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.
158. A. C. Pise, et. al., "Smart Vehicle: A Systematic Review", International Journal - The Ciência & Engenharia - Science & Engineering Journal ISSN: 0103-944XVolume 11 Issue 1, 2023pp: 992–998, 2023.
159. 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.
160. 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.
161. A. C. Pise, et. al., "IoT Based Landmine Detection Robot", International Journal of Research in Science & EngineeringISSN: 2394-8299Vol: 03, No. 04, June-July 2023.
162. 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.
163. A. C. Pise, et. al., "Python Algorithm to Estimate Range of Electrical Vehicle", Web of Science, Vol 21, No 1 (2022) December 2022
164. 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).
165. 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.
166. 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

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 5, Issue 4, October 2025 Impact Factor: 7.67

167. 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.
168. 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.
169. 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.
170. 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
171. A. C. Pise, et. al., "Adaptive Noise Cancellation in Speech Signal", International Journal of Innovative Engg and Technology, 2017
172. 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
173. A. C. Pise, et. al.,"Review on Agricultural Plant Diseases Detection by Image Processing", ISSN 2278-62IX, IJLTET, Vol 7, Issue 1 May 2016
174. A. C. Pise, et. al. "Segmentation of Retinal Images for Glaucoma Detection", International Journal of Engineering Research and Technology (06, June-2015).
175. A. C. Pise, et. al. "Color Local Texture Features Based Face Recognition", International Journal of Innovations in Engineering and Technology(IJIET) , Dec. 2014
176. 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.
177. 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.
178. 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
179. 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.
180. 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.
181. 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.
182. 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.
183. A. C. Pise, et. al., "Facial Expression Recognition Using Facial Features," IEEE International Conference on Communication and Electronics Systems (ICCES 2018), October 2018.
184. 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.
185. 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.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 5, Issue 4, October 2025 Impact Factor: 7.67

186. 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.
187. 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.
188. 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.
189. 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.
190. 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
191. A. C. Pise, et. al. "Single Chip Solution For Multimode Robotic Control", Ist IEEE International Conferene on Computing Communication and Automation, 26-27 Feb2015.
192. 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
193. A. C. Pise, P. Bankar, "Face Recognition using Color Local Texture Features", International Conference on Electronics and Telecommunication, Electrical and Computer Engineering, Apr.2014.
194. 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.
195. 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.
196. 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.
197. 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.
198. 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.
199. 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.
200. A. C. Pise, et. al. "Segmentation of Optic Disk and Optic Cup from retinal Images", ICEECMPE – Chennai, June 2015
201. A. C. Pise, et. al. "Diseases Detection of Pomegranate Plant", IEEE Sponsored International conference on Computation of Power, Energy , April 2015.
202. A. C. Pise, et. al. "Compensation Techniques for I/Q Imbalance in Direct-Conversion Receivers", Conference at SCOE, Pune 2010.
203. 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
204. A. C. Pise, et. al. "Compensation Techniques for I/Q Imbalance in Direct Conversion Receiver", Conference at PICT, Pune 2008.
205. A. C. Pise, et. al. "I/Q Imbalance compensation Techniques in Direct Conversion Receiver ", Conference at DYCOE, Pune 2008.
206. A. C. Pise, et. al. "DUCHA: A New Dual channel MAC protocol for Multihop Ad-Hoc Networks", Conference at SVCP, Pune 2007.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 5, Issue 4, October 2025 Impact Factor: 7.67

207. Godase, V., Pawar, P., Nagane, S., & Kumbhar, S. (2024). Automatic railway horn system using node MCU. Journal of Control & Instrumentation, 15(1).
208. 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.
209. 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.
210. 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.
211. 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.
212. Dange, R., Attar, E., Ghodake, P., & Godase, V. (2023). Smart agriculture automation using ESP8266 NodeMCU. J. Electron. Comput. Netw. Appl. Math, (35), 1-9.
213. Godase, V. (2025). Optimized Algorithm for Face Recognition using Deepface and Multi-task Cascaded Convolutional Network (MTCNN). Optimum Science Journal.
214. Mane, V. G. A. L. K., & Gangonda, K. D. S. Pipeline Survey Robot.
215. 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.
216. Godase, V., & Jagadale, A. (2019). Three element control using PLC, PID & SCADA interface. International Journal for Scientific Research & Development, 7(2), 1105-1109.
217. 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.
218. 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.
219. Godase, V. (2025). Comparative study of ladder logic and structured text programming for PLC. Available at SSRN 5383802.
220. 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.
221. Godase, V. (2025). Smart energy management in manufacturing plants using PLC and SCADA. Advance Research in Power Electronics and Devices, 2(2), 14-24.
222. 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.
223. Godase, V. (2025). Graphene-Based Nano-Antennas for Terahertz Communication. International Journal of Digital Electronics and Microprocessor Technology, 1(2), 1-14.
224. 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.
225. 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.
226. 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.
227. 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.

228. 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.
229. 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.
230. 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.
231. 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.
232. Nagane, M.S., Pawar, M.P., & Godase, P.V. (2022). Cinematica Sentiment Analysis. *Journal of Image Processing and Intelligent Remote Sensing*.
233. Godase, V.V. (2025). Tools of Research. SSRN Electronic Journal.
234. Godase, V. (n.d.). EDUCATION AS EMPOWERMENT: THE KEY TO WOMEN'S SOCIO ECONOMIC DEVELOPMENT. Women Empowerment and Development, 174–179.
235. 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).
236. 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).
237. Dhope, V. (2024). SMART PLANT MONITORING SYSTEM. In International Journal of Creative Research Thoughts (IJCRT). https://www.ijcrt.org
238. 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/zendo.15056435
239. M. M. Zade, Bramhadev B. Rupanar, Vrushal S. Shilawant , Akansha R. Pawar(2025) "IOT Flood Monitoring & Alerting System using Rasberry Pi-Pico "International Journal of Research Publication & Reviews , Volume 6 ,Issue 3,ISSN:2582-7421.DOI:https://ijrpr.com/uploads/V6ISSUE3/IJRPR40251.pdf
240. 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
241. 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.
242. 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.
243. 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
244. 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
245. 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
246. 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

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 5, Issue 4, October 2025 Impact Factor: 7.67

247. 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
248. 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
249. 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.
250. 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.
251. 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.
252. 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.
253. 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.
254. A. O. Mulani, V. Godase, S. Takale, and R. Ghodake, "Secure Image Authentication using AES and DWT Watermarking on Reconfigurable Platform," International Journal of Embedded System and VLSI Design, vol. 1, no. 2, pp. 14-20, Oct. 2025.