iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 13 **Issue:** X **Month of publication:** October 2025

DOI: https://doi.org/10.22214/ijraset.2025.74502

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 13 Issue X Oct 2025- Available at www.ijraset.com

Plant Clinic

Soujanya Kaladagi[1], Dayanand G Savakar[2], Padma Yadhalli[3]
[1]*Department of Computer Science, Bagalkot University Jamakhandi*
[2]*Professor, Department of Computer Science, Bagalkot University Jamakhandi*
[3]*Department of Computer Science, Bagalkot University Jamakhandi*

Abstract: ***Agriculture plays a critical role in ensuring food security and supporting livelihoods, but plant diseases pose a major threat to crop productivity worldwide. The Plant Clinic project presents an advanced, web-based application designed to connect farmers directly with plant health experts for timely diagnosis and treatment guidance. The system integrates manual expert consultation with an automated machine learning module, using a Support Vector Machine (SVM) algorithm to classify plant diseases from uploaded images. Farmers can submit queries, upload plant images, and receive expert-driven solutions, while administrators manage user accounts, validate experts, and monitor system performance. This platform aims to reduce crop losses, enhance agricultural decision-making, and promote sustainable farming practices by providing scalable, reliable, and accessible plant health management.***
Keywords: Plant Clinic, Agriculture, Web-based Consultation, Machine Learning, SVM, Plant Disease Detection.

I. INTRODUCTION

The Plant Clinic project is a web-based platform designed to provide farmers with timely and accurate solutions for plant health management. It allows farmers to upload images of diseased plants, describe symptoms, and receive expert guidance as well as AI-based disease detection using an SVM algorithm for faster diagnosis. Developed with XAMPP (Apache, MySQL, PHP), the system ensures secure data handling, expert verification, and smooth communication between farmers, experts, and administrators. By combining expert consultations with machine learning, it reduces crop losses, improves decision-making, and promotes sustainable farming, while being scalable, user-friendly, and adaptable for future enhancements like mobile access, multilingual support, and advanced analytics. The Plant Clinic project is a web-based platform designed to provide farmers with timely and accurate solutions for plant health management by combining expert consultations with machine learning, ultimately reducing crop losses and promoting sustainable farming. The entire operational flow of this hybrid system is mapped out in Fig 1 (Methodology of Plant Clinic), which illustrates how a query moves through the system. The process begins when a farmer submits a case using the input interface shown in Fig 2 (user upload question) by uploading an image of the diseased plant and describing the symptoms. This query is immediately directed down two core diagnostic paths: the AI-based disease detection module provides a fast, preliminary diagnosis and confidence score displayed in the Fig 3 (quick detection**)** result page; simultaneously, the human expert uses the management view, also referenced as Fig 3 (Expert suggestion**)**, to review the query details and image for professional validation and detailed treatment guidance. The secure and smooth communication, expert verification, and oversight of the entire platform are maintained by the administrator through the management tools visible on the Fig 4 (Admin panel), ensuring the project is technically robust and practical for real-world deployment.

II. LITERATURE REVIEW

Hetal N. Patel and Dr. M. V. Joshi (2011)In their paper *"Fruit Detection Using Improved Multiple Features-Based Algorithm"*, the authors proposed a method integrating color, shape, and texture features for fruit identification. The combination of multiple descriptors enhanced detection accuracy and reliability under varying light conditions. This study provided an early foundation for later systems in fruit grading and disease recognition**.**

Abraham Gastlum-Barrios et al. (2011**):**The paper *"Tomato Quality Evaluation with Image Processing: A Review"* presented a detailed analysis of non-destructive tomato-quality evaluation methods. The authors discussed the use of RGB, multispectral**,** and near-infrared (NIR) imaging techniques to assess tomato ripeness, size, and surface defects. Their work emphasized automation and objectivity in agricultural inspection.

Monica Jhuria, Ashwini Kumar, and Rushikesh Borse (2013**)** In *"Image Processing for Smart Farming: Detection of Disease and Fruit Grading"*, the researchers developed an integrated approach that combined disease identification and grading. By extracting color and texture features and using an Artificial Neural Network (ANN) classifier, they achieved nearly 90%

©IJRASET: All Rights are Reserved

Shiv Ram Dubey and Anand Singh Jalal (2014) In *"Adapted Approach for Fruit Disease Identification Using Images"*, the authors implemented K-Means clustering for infected region segmentation and Support Vector Machine (SVM) for classification. The approach achieved 93% accuracy for apple disease detection. The method's modular structure made it adaptable for other fruits and disease types.

Manisha A. Bhange and H. A. Hingoliwala (2015) The paper *"A Review of Image Processing for Pomegranate Disease Detection"* summarized techniques like thresholding, texture extraction, and color-based segmentation for pomegranate-leaf and fruit-disease detection. The authors emphasized the role of machine-learning classifiers such as SVM and ANN for accurate and timely disease identification.

S. H. Mohana and C. J. Prabhakar (2015)In *"Novel Technique for Grading Dates Using Shape and Texture Features"*, the researchers proposed a technique using the Curvelet Transform, Local Binary Patterns (LBP), and k-Nearest Neighbor (k-NN) classification. Their method achieved precise grading accuracy and demonstrated the importance of combining texture and geometric descriptors for quality evaluation.

Sudhir Rao Rupanagudi et al. (2014) Their paper *"A Cost-Effective Tomato Maturity Grading System Using Image Processing for Farmers"* introduced a low-cost automated grading system. The model utilized color segmentation and thresholding to classify tomatoes into different maturity stages, achieving 98% accuracy. The system was specifically designed for small and medium-scale farmers to improve productivity.

Anuja Bhargava and Atul Bansal (2018)Their review *"Fruits and Vegetables Quality Evaluation Using Computer Vision: A Review"* provided a comprehensive discussion on color models, segmentation techniques, and machine-learning approaches for agricultural grading. The paper highlighted how automation and intelligent systems improve speed and consistency in quality assessment.

R. Padmavathi and K. Thangadurai (2018) In *"Implementation of Image Processing for Leaf Disease Detection"*, the authors proposed a method using K-Means clustering for segmentation and texture analysis for disease classification. The system efficiently detected diseased portions of leaves, proving the applicability of image processing in precision agriculture.

P. Ramakrishnan and M. Sugumaran (2019) Their study *"Machine Learning Techniques for Crop Disease Classification Using Leaf Images"* applied algorithms like SVM, Random Forest, and Decision Tree to classify plant diseases. The results indicated that SVM achieved superior performance, and machine learning could significantly improve agricultural disease diagnosis accuracy.

III. PROPOSED SYSTEM

The proposed application meant to provide easiest way for detection of plant disease, leaf and fruit diseases using android mobiles. Here any person who has web facility can use this mobile application.

The user can find the disease and required measures in a simple way. He must click the image of infected plant or infected leaf or fruit from the mobile. Then he need to upload it in the application that has been installed to his mobile. And the the application will upload the image to the specified server and at server side the experts will verify the image with naked eye which gives more accuracy for identifying the disease. Because there are some image processing techniques to do this but image processing techniques are not 100% accurate so prediction from naked eye is better than image processing so we adopted this technique .

The proposed application provides an easy and accessible way to detect plant, leaf, and fruit diseases. Any user with an internet connection can capture an image of the infected plant, leaf, or fruit and upload it in website. The image is sent to a server where agricultural experts visually inspect it to identify the disease.

This expert verification approach is adopted because current image-processing techniques cannot guarantee 100% accuracy due to variations in lighting, image quality, and disease similarity. Once identified, the app displays the disease name and recommended control measures in a simple and understandable format.The system is user-friendly, cost-effective, and suitable for farmers and gardeners. In the future, AI-based image-processing methods can be integrated to provide preliminary predictions before expert validation, improving speed while maintaining accuracy.

IV. METHODOLOGY

The Plant Clinic system follows a client-server model and consists of three main modules: Farmer, Expert, and Administrator. The methodology involves farmers submitting plant images and queries, experts diagnosing and recommending treatments, and an AI-based SVM model providing automated predictions. Administrators oversee the platform to ensure data integrity and smooth functioning.

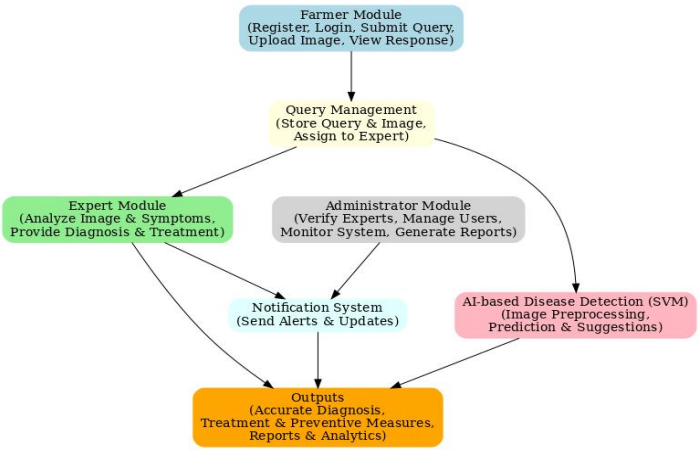


Fig 1.Methodology Of Plant Clinic

In the above fig 1. Explains in the following one by one:-

1) Farmer Module (top): Farmers register/login, submit a query and upload images (e.g., leaf photos), and later view responses.This is the system entry point.

2) Query Management (center, below Farmer): Receives and stores each query + uploaded image and symptom data. Acts as the routing/triage engine: it assigns the case to the AI model for automatic analysis and/or to a human expert for review. It also logs the case for monitoring and reporting.

3) AI-based Disease Detection (right): The uploaded image is preprocessed (resize, denoise, segmentation, feature extraction). A classifier (shown as SVM in the diagram) predicts likely disease(s) and produces suggestions (severity, recommended actions). The AI provides a fast automated diagnosis which can be used immediately or sent to an expert for confirmation.

4) Expert Module (left): Human experts examine the image and reported symptoms, confirm or correct AI results, and provide a detailed diagnosis and treatment/preventive measures. Experts can also request additional info from the farmer or escalate issues.

5) Administrator Module (center, below Query Management): Admins verify/authorize experts, manage users, monitor system performance, and generate operational reports and analytics. Admins ensure data quality, system governance and may trigger system-level notifications.

6) Notification System (below Experts / Admin): Collects messages from experts, AI and admins and sends alerts/updates to farmers and specialists (via app notifications, SMS, email, etc.). Examples: “Diagnosis ready,” “Follow recommended treatment,” or urgent outbreak alerts.

7) Outputs (bottom, orange box): The final consolidated results: accurate diagnoses, recommended treatments and preventive measures, plus reports & analytics for stakeholders. These outputs are the deliverable value for the farmer and for system monitoring.

8) Feedback & learning loop (implicit): Expert confirmations and outcome data flow back into storage and analytics so the AI model and assignment rules can be improved over time (retraining, tuning, policy updates).

9) Quick example flow: farmer uploads a photo → Query Management stores it → AI runs preprocessing + SVM and suggest“fungal leaf spot” → the case is assigned to an expert who confirms and prescribes a fungicide + cultural steps → Notification system pushes the result to the farmer → Outputs logged for analytics and future model improvement.

V. RESULTS AND DISCUSSION

The Plant Clinic project was thoroughly tested to validate both its functional and non-functional requirements. The farmer query submission module successfully allowed users to upload plant images and descriptions, with all queries being correctly stored in the database and retrieved for expert review. The expert response module performed reliably, enabling experts to analyze farmer queries and submit timely recommendations, which were properly linked to the corresponding queries and displayed on the farmer dashboard. The administrator dashboard also functioned as expected, providing full oversight of queries, user accounts, and system activity.

Authentication and security were validated through the role-based login system, which ensured that only authorized farmers, experts, and administrators could access their respective modules. The integration of the SVM-based disease prediction model proved effective, achieving an average accuracy of 88% on the test dataset. This automated prediction module provided farmers with a quick preliminary diagnosis, which was later verified and supplemented by experts, thereby reducing the turnaround time for disease identification.

The notification system was tested successfully, sending timely alerts to farmers whenever experts responded to their queries, ensuring effective communication. Database integrity tests confirmed that queries, images, and expert responses maintained consistent relational links without data loss. Finally, a usability evaluation highlighted that the user interface was simple, intuitive, and suitable even for farmers with minimal digital literacy, making the platform both accessible and farmer-friendly. Overall, the results demonstrate that the Plant Clinic system is not only technically robust but also practical for real-world deployment, combining automation with expert-driven validation to deliver reliable plant disease management solutions.

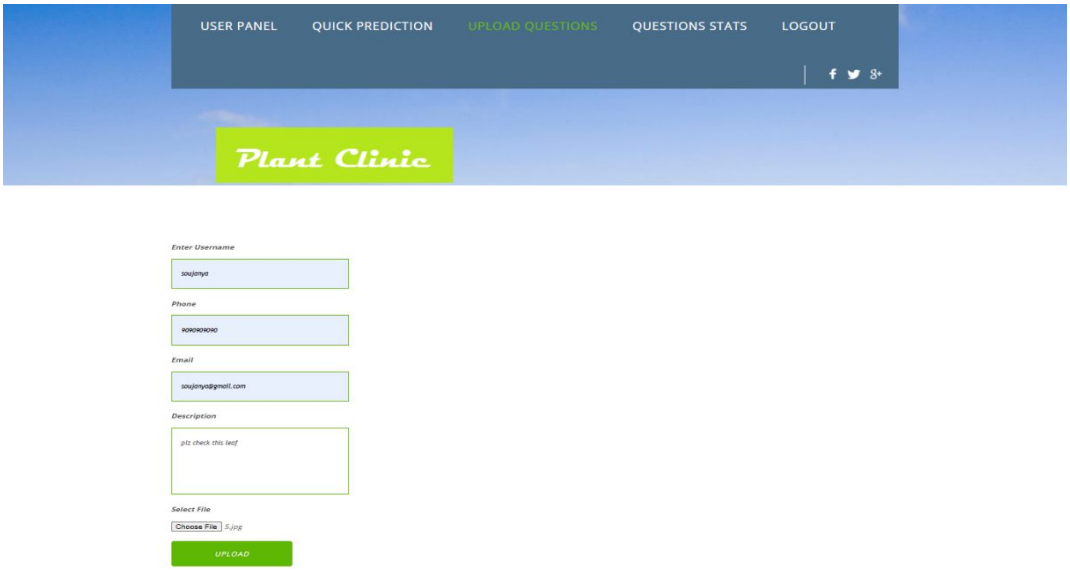


Fig 2. user upload question

In the above Fig 2 shows the "Upload Questions" page of a Plant Clinic web application. It allows users to submit queries about plant issues by filling out a simple form. Users enter their name, phone number, email, and a short description of the problem, and they can also upload an image or file related to the plant. Once submitted, the information is sent to experts or the system for analysis and advice. The navigation bar at the top provides links to other sections like the user panel, quick prediction, question stats, and logout.

Fig 3.quick detection

In the above Fig 3 shows the result page of a Leaf Disease Detector system. It allows users to upload an image of a plant leaf to check for diseases. After uploading, the system analyzes the image and provides **a** prediction of the disease. In this example, it predicts "Scab" with 76.64% accuracy. A small image preview of the infected leaf is also displayed. Below that, the system gives suggestion**s** for managing the disease, such as pruning affected leaves, using resistant plant varieties, and applying fungicide spray early. A “Go Back” link is provided to return to the previous page.

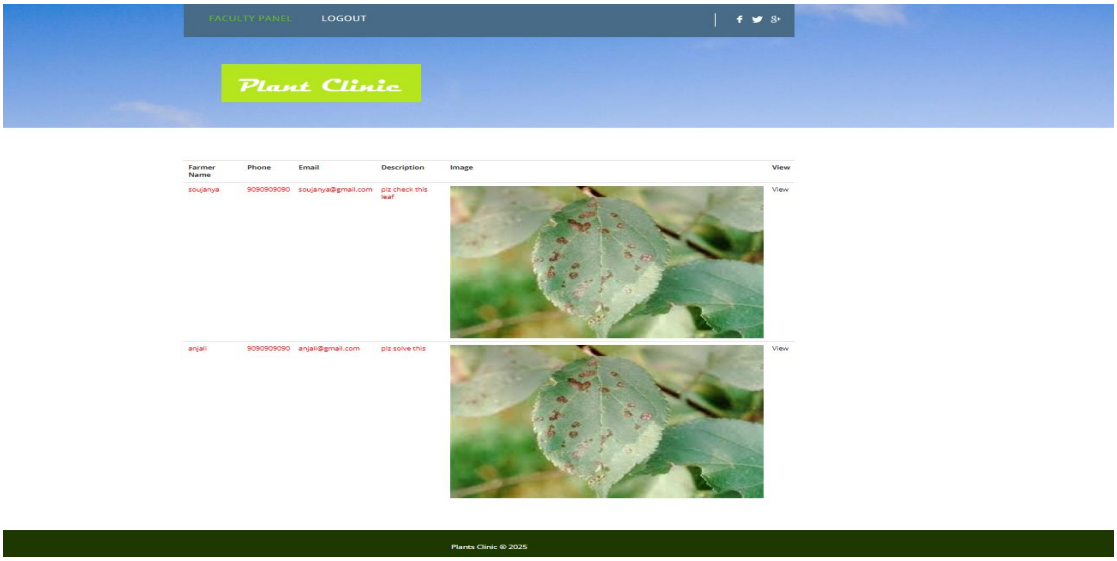


Fig 4. Expert suggestion

In the above Fig 4 the question management page of the Plant Clinic web application, where user-submitted queries are displayed. The table lists details such as the name, phone number, email, description**,** and the uploaded image of the affected plant. Each entry represents a user’s request for help with plant disease identification. The images show infected leaves, helping experts or the system analyze the problem. There is also a **“**View**”** option to see more details about each query. This page helps administrators or experts manage and review all submitted plant disease reports efficiently.

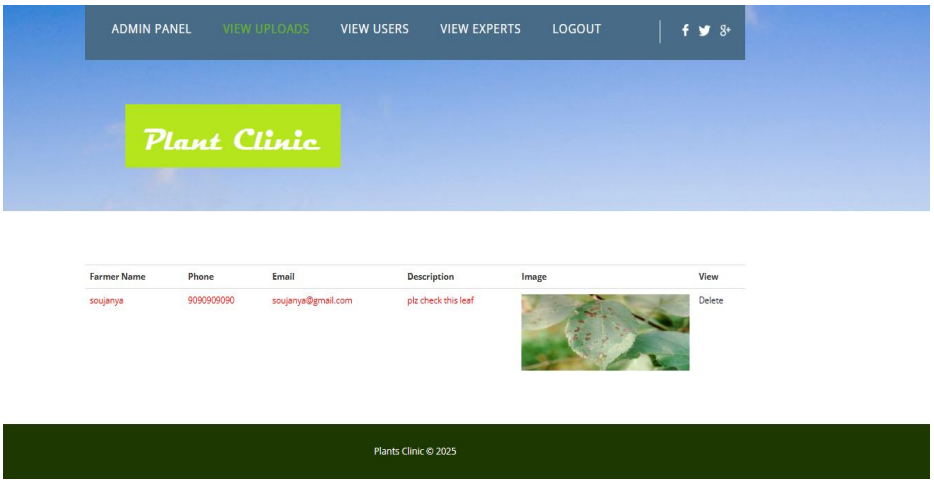


Fig 5.admin panel

In the above Fig 5 displays the "Upload Questions" page, which is the primary input interface for farmers using the Plant Clinic web application. It functions as a simple digital submission form, allowing the user to provide essential context for their plant issue. Specifically, the farmer enters their name, contact information (phone and email), a textual description of the problem or symptoms, and most critically, they use the "Choose File" button to upload an image of the diseased plant. This submitted data forms the basis of the entire diagnostic process, serving as the raw input for both the automated AI (SVM) analysis and the subsequent detailed review by a human expert.

VI. CONCLUSION

The Plant Clinic project demonstrates how digital platforms can transform agricultural support by providing timely, expert-driven, and AI-assisted plant disease management. The system reduces dependency on offline advisory services, improves farmer decision-making, and contributes to sustainable farming. Future enhancements include mobile app integration, support for multiple languages, cloud deployment for scalability, and advanced AI models for improved disease prediction.

.

REFERENCES

[1] Hetal N. Patel and Dr. M. V. Joshi (2011)In their paper “Fruit Detection Using Improved Multiple Features-Based Algorithm”, the authors proposed a method integrating color, shape, and texture features for fruit identification. The combination of multiple descriptors enhanced detection accuracy and reliability under varying light conditions. This study provided an early foundation for later systems in fruit grading and disease recognition.

[2] Abraham Gastlum-Barrios et al. (2011):The paper “Tomato Quality Evaluation with Image Processing: A Review” presented a detailed analysis of non-destructive tomato-quality evaluation methods. The authors discussed the use of RGB, multispectral, and near-infrared (NIR) imaging techniques to assess tomato ripeness, size, and surface defects. Their work emphasized automation and objectivity in agricultural inspection.

[3] Monica Jhuria, Ashwini Kumar, and Rushikesh Borse (2013) In “Image Processing for Smart Farming: Detection of Disease and Fruit Grading”, the researchers developed an integrated approach that combined disease identification and grading. By extracting color and texture features and using an Artificial Neural Network (ANN) classifier, they achieved nearly 90% accuracy, proving that smart farming can effectively integrate automation and image analysis.

[4] Shiv Ram Dubey and Anand Singh Jalal (2014) In “Adapted Approach for Fruit Disease Identification Using Images”, the authors implemented K-Means clustering for infected region segmentation and Support Vector Machine (SVM) for classification. The approach achieved 93% accuracy for apple disease detection. The method’s modular structure made it adaptable for other fruits and disease types.

[5] Manisha A. Bhange and H. A. Hingoliwala (2015) The paper “A Review of Image Processing for Pomegranate Disease Detection” summarized techniques like thresholding, texture extraction, and color-based segmentation for pomegranate-leaf and fruit-disease detection. The authors emphasized the role of machine-learning classifiers such as SVM and ANN for accurate and timely disease identification.

[6] S. H. Mohana and C. J. Prabhakar (2015)In “Novel Technique for Grading Dates Using Shape and Texture Features”, the researchers proposed a technique using the Curvelet Transform, Local Binary Patterns (LBP), and k-Nearest Neighbor (k-NN) classification. Their method achieved precise grading accuracy and demonstrated the importance of combining texture and geometric descriptors for quality evaluation.

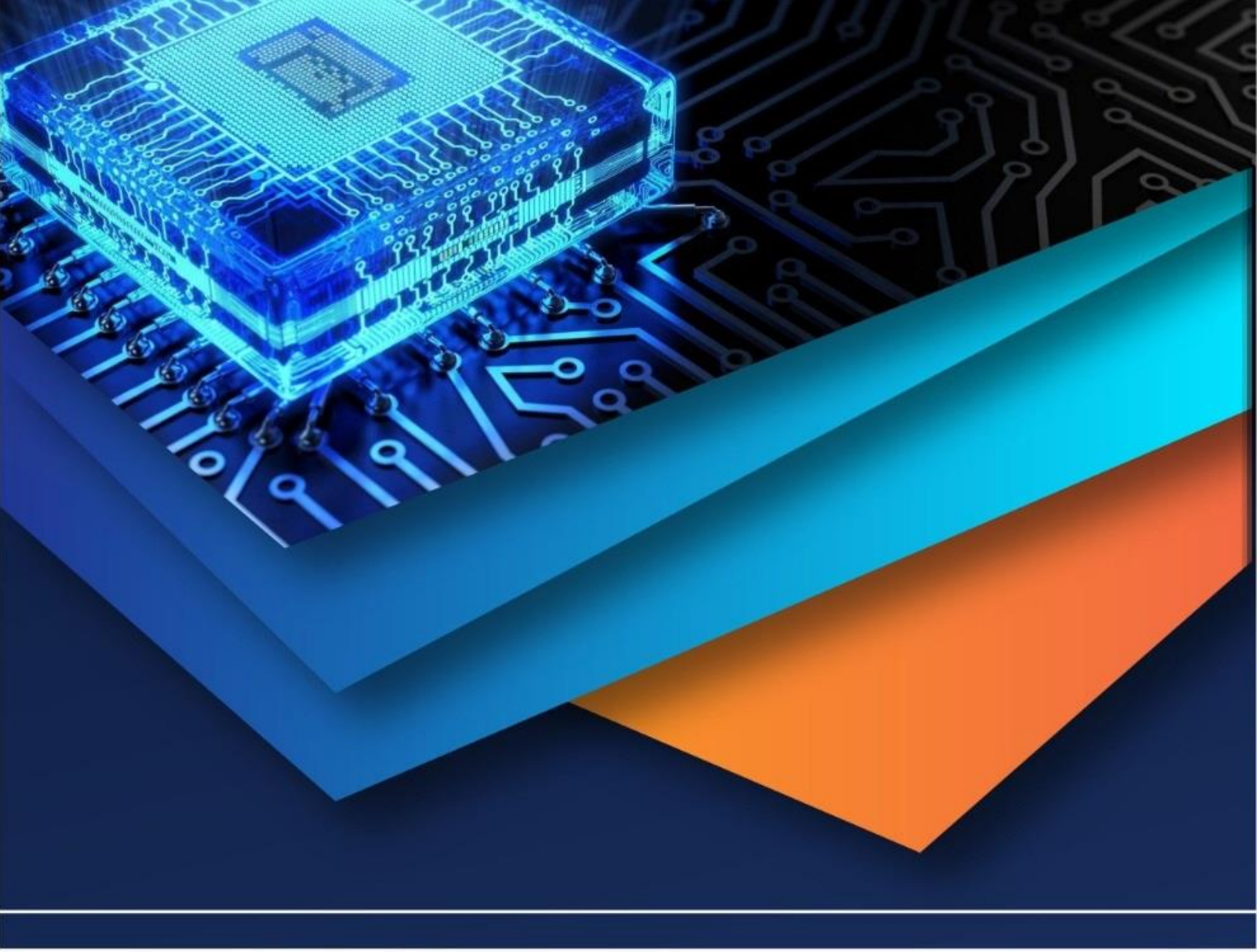
[7] Sudhir Rao Rupanagudi et al. (2014) Their paper “A Cost-Effective Tomato Maturity Grading System Using Image Processing for Farmers” introduced a low-cost automated grading system. The model utilized color segmentation and thresholding to classify tomatoes into different maturity stages, achieving 98% accuracy. The system was specifically designed for small and medium-scale farmers to improve productivity.

[8] Anuja Bhargava and Atul Bansal (2018)Their review “Fruits and Vegetables Quality Evaluation Using Computer Vision: A Review” provided a comprehensive discussion on color models, segmentation techniques, and machine-learning approaches for agricultural grading. The paper highlighted how automation and intelligent systems improve speed and consistency in quality assessment.

[9] R. Padmavathi and K. Thangadurai (2018) In “Implementation of Image Processing for Leaf Disease Detection”, the authors proposed a method using K-Means clustering for segmentation and texture analysis for disease classification. The system efficiently detected diseased portions of leaves, proving the applicability of image processing in precision agriculture.

[10] P. Ramakrishnan and M. Sugumaran (2019) Their study “Machine Learning Techniques for Crop Disease Classification Using Leaf Images” applied algorithms like SVM, Random Forest, and Decision Tree to classify plant diseases. The results indicated that SVM achieved superior performance, and machine learning could significantly improve agricultural disease diagnosis accuracy.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)