Engineering

Progressive Education Society's

Modern College of Engineering, Shivajinagar, Pune-05.

Department of Electronics and Telecommunication

TE. Mini Project Log Book

Academic Year: 2024-25

Project ID:-A23

Name of Student: - 1. Shubham Gavade

2. Abhijeet Khomane

3. Purva Patil

Name of the Guide:- MR. A.R. GANGAJALIWALE

Project Title: - IOT based Plant Disease Recognition System Using ESP32CAM

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QUALITY POLICY OF THE INSTITUTE

We, PES Modern College of Engineering are committed to develop and foster cultured and promising professionals by imparting quality education in the field of Engineering and Management.

VISION OF THE INSTITUTE

To create a collaborative academic environment to foster professional excellence and ethical values

MISSION OF THE INSTITUTE

- **To develop outstanding engineers & professionals with high ethical standards capable of creating and managing global enterprises.**
- **To foster innovation and research by providing a stimulating learning environment.**
- **To ensure equitable development of students of all ability levels and backgrounds.**
- **To be responsive to changes in technology, socio-economic levels and environmental conditions.**
- **To foster and maintain mutually beneficial partnerships with alumni and industry.**

Progressive Education Society's

Modern College of Engineering, Shivajinagar, Pune-05.

Department of Electronics and Telecommunication

DEPARTMENTAL QUALITY POLICY

We at Department of Electronics and Telecommunication Engineering are committed to provide a comprehensive learning environment for all round development of our students.

DEPARTMENTAL VISION

To impart holistic Education in Electronics and Telecommunication Engineering to create engineers equipped to meet the challenges of a dynamic, global environment.

DEPARTMENTAL MISSION

- **To impart quality Education in the field of Electronics, Communication and Signal processing, by providing a comprehensive learning experience.**
- **To provide avenues to encourage students to continue education in diverse fields.**
- **To develop competent Engineers, well-versed in multi-disciplinary fields.**
- **To inculcate ethical and professional values in our students to endow society with responsible citizens.**

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PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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PROGRAM EDUCATIONAL OBJECTIVES

The graduates of Electronics and Telecommunication Engineering Department of P.E. S's MCOE will

- **Apply design and development skills related to E&TC Engineering to solve real life problems**
- **Pursue careers as Entrepreneurs, Engineers or Managers in Private/Government sectors or continue their education in the same or multi-disciplinary fields.**
- **Practice ethical standards, adhere to social responsibilities and lead teams of professionals in the global environment**

PROGRAM SPECIFIC OUTCOMES

At the time of graduation, the students of the ENTC department of PES's MCOE, will be able to

- **Apply the Knowledge in E&TC engineering to understand, evaluate, design, or implement the electronics, communication, embedded or information systems or sub-systems using conventional or modern tools/techniques**
- **Take up jobs in Government or private sectors, undertake research, create jobs or pursue further studies in any of the fields of E&TC, in India or Abroad.**
- **Incorporate ethical & social responsibility to complete projects in the E& TC and allied fields and use effective written and oral communication skills to present the work.**

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Mini Project (304200)

Weekly Work Load(in Hrs)	Lecture	Tutorial	Practical
	-	-	4

Online/ In-Sem	Theory	Practical	Oral	Term-work	Total Marks	Credits-2	
-	-	-	50	25	50	TH-NA	PR-2

Syllabus

A. Execution of Mini Project

· Project group shall consist of not more than 3 students per group.
· Mini Project Work should be carried out in the Design / Projects Laboratory.
· Project designs ideas can be necessarily adapted from recent issues of electronic design magazines Application notes from well-known device manufacturers may also be referred.
● Use of Hardware devices/components is mandatory.
· Layout versus schematic verification is mandatory.
· Bare board test report shall be generated.
· Assembly of components and enclosure design is mandatory.

B: Selection: Domains for projects may be from the following, but not limited to:

·Instrumentation and Control Systems
·Electronic Communication Systems
·Biomedical Electronics
·Power Electronics
·Audio, Video Systems
·Embedded Systems
·Mechatronic Systems
·Microcontroller based projects should preferably use Microchip PIC controllers / ATmega controller / AVR microcontrollers / Arduino / Raspberry Pi.

C. Monitoring: (for students and teachers both)

Suggested Plan for various activities to be monitored by the teacher.

Week 1 & 2: Formation of groups, Finalization of Mini project & Distribution of work.
Week 3 & 4: PCB artwork design using an appropriate EDA tool, Simulation.
Week 5 to8: PCB manufacturing through vendor/at lab, Hardware assembly, programming (if required) Testing, Enclosure Design, Fabrication etc
Week 9 & 10: Testing of final product, Preparation, Checking & Correcting of the Draft Copy of Report
Week 11 & 12: Demonstration and Group presentations.

Log book for all these activities shall be maintained and shall be produced at the time of examination.

D. Report writing

·A project report with following contents shall be prepared:

- Title
- Specifications
- Block diagram
- Circuit diagram
- Selection of components, calculations
- Simulation results
- PCB artwork
- Testing procedures
- Enclosure design
- Test results
- Conclusion
- References

Course Objectives:

- **To plan** for various activities of the project and distribute the work amongst team members.
- **To inculcate** electronic hardware implementation skills by, learning PCB artwork design using an appropriate EDA tool, imbibing good soldering and effective trouble-shooting practices.
- **To elaborate** the importance of document design by compiling Technical Report on the Mini Project work carried out.
- **To develop** student‘s abilities to transmit technical information clearly through delivery of Seminar based on the Mini Project.

Course Outcomes:

On completion of the course, students will be able to

CO1. Identify a need based project to be executed as a team with systematic planning.

CO2. Develop mini project (product) with PCB artwork design, soldering techniques, trouble shooting and necessary software tools. (BTL- 6)
CO3. Prepare a technical report based on the Mini project. (BTL- 3)
CO4. Deliver technical seminar based on the Mini Project work carried out. (BTL- 3)

CO – PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	3	-	2	-
CO2	-	-	3	-	3	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	3	-	2
CO4	-	-	-	-	-	-	-	-	3	-	3	2
CO*	**-**	**-**	**3**	**-**	**3**	**-**	**-**	**-**	**3**	**3**	**3**	**2**

CO – PSO Mapping

CO	PSO 1	PSO 2	PSO 3
CO1	2	2	3
CO2	3	3	3
CO3	-	1	3
CO4	-	1	3
CO*	**3**	**2**	**3**

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Guidelines about Log Book

1. The project log book should be handled carefully.
2. Students must enter the correct information in the mini project log book.
3. All the entries in the mini project log book should be verified by the guide.
4. Activity planned should be completed as per schedule.
5. Submit soft and hard copies of synopsis, project report as per schedule.
6. Fortnightly progress report should be duly filled by the students.
7. This Log book, along with the project report must be submitted to the project coordinator after TE mini project examination.
8. Students must carry log book with them, for every practical and project exhibition / Mock exam.

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Project Guidelines for Students

1. Project can be in any area viz. Embedded, Signal Processing, Communication etc.
2. It can be sponsored/In-house.
3. Sponsorship letter format is available with Project Coordinators and it must be printed on college letter head.
4. For sponsored projects letter of sponsorship from the company is must and it must be submitted to the Project Coordinators
5. Out of three synopses, one will be finalized by project coordinator. Then you have to prepare PPT in given format and present it in front of industry experts. Once they approve your project submit final synopsis with all modifications suggested to project coordinator. Then, students can start with Literature Survey.
6. Mini Project Schedule has to be followed strictly for timely completion of the project work.
7. IEEE / Journal / Conference paper on selected / approved topic must be available with the students.
8. For downloading IEEE paper students may contact in main library and ask for IEL online membership subscription. Old IEEE hard copies are available in Main as well as Departmental Library.
9. Students should take part in various project competitions.
10. Also, they should try for copyrighting and patenting of their project idea.
11. At the time of project exhibition /competition project should be ready in all Aspects
12. For any further query related to project; students can contact to Project Guides and coordinators

Mini Project Schedule

Academic Year: 2024 – 2025 **Term: II**

Sr.No.	Date	Work planned in Lab Hours
1	06/01/2025	Formation of groups, Submission of synopsis
2	13/01/2025	Finalization of Mini project & Distribution of work, Feasibility report Submission-
3	27/01/2025	Circuit Schematic, Algorithm
4	10/02/2025	PCB artwork design/ programming and simulation
5	17/02/2025	Hardware - Soldering and Software-Testing
6	24/02/2025	programming and (if required) Testing,
7	03/03/2025	Enclosure Design, Fabrication etc./GUI
8	18/03/2025	Testing of final product
9	24/03/2025	Documentation- Preparation, Checking & Correcting of the Draft Copy of Report-One page report, PPTs, Poster, final Seminar Report, Paper Publication (mandatory)
10	29/03/2025	Demonstration/Mock presentation
11	07/04/2025	Final Project presentations/project exhibition

Mini-Project Group Details

1. Project ID:A23
2. Title of Project: IOT based Plant Disease Recognition System Using ESP32CAM
3. Area / Domain of Project (with consent of Project Guide): VLSI / Embedded / Signal Processing / Communication (tick appropriate option)
4. Type of Project (with consent of Project Guide): Application / Product / Research / Review (tick appropriate option)
5. Mapping of Project with PO & PSO (with consent of Project Guide): _____
6. Group Details:

   1) Name of the Student: Shubham Gavade

      Roll No: 34528

      Mobile No: 7057652014

      Email-id: Shubham_gaonkar_ece@moderncoe.edu.in

   2) Name of the Student: Abhijeet Khomane

      Roll No:34541

      Mobile No: 7666200956

      Email-id:abhijeet_khomane_ece@moderncoe.edu.in

   3) Name of the Student: Purva Patil

      Roll No.:34556

      Mobile No.:7821058070

      Email-id:purva_patil_ece@moderncoe.edu.in

7. Name of the Guide: _____

Undertaking

We, (Mr. / Ms.) Shubham Gavde, Abhijeet Khomane and Purva Patil

of TE (E & TC) hereby assure, that we will follow the rules & regulations formulated by the University & the Department. We will follow the dates displayed in project schedule and in the notices.

The Project entitled **IOT based Plant Disease Recognition System Using ESP32CAM**

will be fully designed & developed by us & no part of the work will be borrowed or purchased from any agency.

Name of Students	Signature
1.Shubham Gavade	
2. Abhijeet Khomane	
3.Purva Patil	

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Synopsis

Title of the Project: IOT based Plant Disease Recognition System Using ESP32CAM

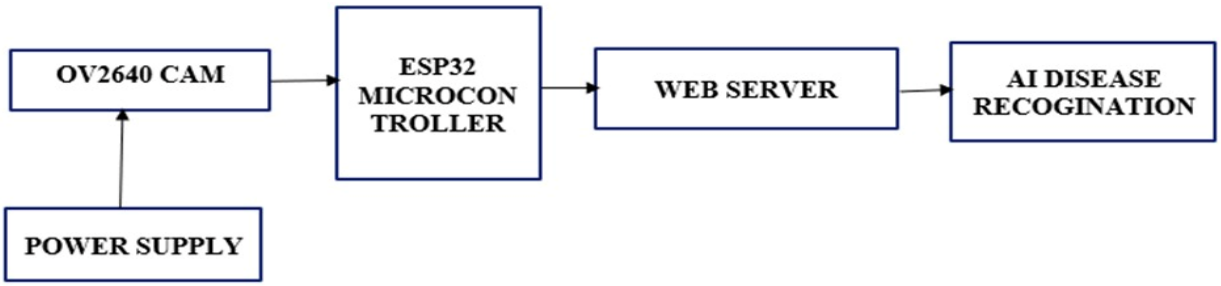
Group Id:A23

Aim: To design and implement an IoT-based system using the ESP32-CAM module for real-time detection and recognition of plant diseases through image processing and machine learning, enabling remote monitoring and early diagnosis to support smart agriculture and reduce crop loss.

Objective:

1. To develop a low-cost and efficient plant disease recognition system using the ESP32-CAM module.
2. To capture real-time images of plant leaves using the ESP32-CAM and transmit them for analysis.
3. To implement a machine learning or deep learning model for accurate detection and classification of common plant diseases.

Block Diagram:



Project Idea:

The *IoT-based Plant Disease Recognition System using ESP32-CAM* is a smart agriculture solution that uses a small camera module (ESP32-CAM) to automatically capture images of plant leaves. These images are analyzed using a machine learning model to detect signs of diseases. Once a disease is identified, the system sends alerts to farmers or users via the internet, allowing them to take quick action.

Applications:

1. **Smart Agriculture:** Enables real-time plant health monitoring and early disease detection.
2. **Precision Farming:** Helps farmers apply targeted treatments, reducing pesticide use.
3. **Greenhouse Management:** Automatically monitors plants in controlled environments.
4. **Research & Education:** Assists in agricultural research and practical training for students.

Interaction with Mini-Project Coordinator

Sr.No	Date	Interaction with Mini-Project Coordinator	Sign of Students	Sign of Mini-Project Guide and Coordinator

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Interaction with Industry Expert

Project ID: A 2 3 Date of PPT Presentation: _____

Project Title: IOT based Plant Disease Recognition System Using ESP32CAM

Modifications Suggested: _____

_____

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_____

Name and Sign of
Industry Expert

Name and Sign of
Mini-Project Guide

Feasibility Report

I. Technical and Commercial Aspect

1. Availability of components:

Sr. No.	Name of Component	Specification	Quantity	Rate(Rs.)	Market Availability (Local/ Online)	Time to purchase	Total Cost (Rs.)
	ESP32 cam		1	750	Local		750
	OV2640		1	120	Local		120
	Lcd Display		1	100	Local		100
	Ftdi programmer		1	90	Local		90
			Grand Total				1060

***Note: If components are purchase online, mention shipping charges separately.**

2. Software tools required for PCB making, simulation, programming etc.?

Sr. No.	Software details (version, open source / license / trial / student)	System requirement for installation
1	PHP	Xampp
2	Mysql	Xampp
3.	Python	VsCODE
4.	Arduino IDE- Open Source	OS: Window, Ram:4gb, Disk : 500gb.

3. Enclosure details (Dimensions, Weight, Material used)

Dimensions : 40.5mm X 27mm X 4.5 mm

Weight : 0.082kg .

II. Behavioral Aspect

i. Is the project hazardous to environment:

ii. Have you considered societal, health, safety, legal and cultural issues while selecting project?

iii. Mention the applicability of the project:

III. Distribution of Work

1. Name of student: Shubham Gavade

   a. Knowledge of component verification and testing:

   b. Knowledge of software used

   c. PCB making and soldering

   d. Programming Languages Known

   e. Troubleshooting and testing skills

   f. Planned Man hours

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2. Name of student: Abhijeet Khomane

g. Knowledge of component verification and testing:

h. Knowledge of software used

i. PCB making and soldering

j. Programming Languages Known

k. Troubleshooting and testing skills

l. Planned Man hours

3. Name of student: Purva Patil

m. Knowledge of component verification and testing:

n. Knowledge of software used

o. PCB making and soldering

p. Programming Languages Known

q. Troubleshooting and testing skills

r. Planned Man hours

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Plan of Action

Sr. No.	Date	Work planned	Signature of Students		
1.	01–05 Jan	Finalize project idea and scope			
2.	06–10 Jan	Requirement gathering and initial research			
3.	11–15 Jan	Tech stack finalization			
4.	16–20 Jan	Design UI wireframes and rough prototypes			
5.	21–25 Jan	Set up GitHub repo and basic project structure			
6.	26–31 Jan	Develop landing page and routing setup			
7.	01–05 Feb	Implement login and registration module			
8.	06–10 Feb	Set up backend API			
9.	11–15 Feb	Connect frontend with backend (Auth part)			
10.	16–20 Feb	Work on homepage and main dashboard UI			
11.	21–25 Feb	Integrate MongoDB and basic CRUD operations			
12.	26–29 Feb	Start yoga class/course modules (or other main feature)			
13.	01–05 Mar	Create admin panel or management dashboard			
14.	06–10 Mar	Implement video/YT channel integration			
15.	11–15 Mar	Add daily class scheduling/booking features			
16.	16–20 Mar	Work on online store/book selling section			
17.	21–25 Mar	Apply responsive design and improve UI/UX			
18.	26–31 Mar	Start testing features and fixing bugs			
19.	01–05 Apr	Final round of testing and documentation			
20.	06–10 Apr	Prepare project report and presentation slides			

Name and Signature of Project Guide

Sponsorship Letter

(Paste Sponsorship Letter here)

Fortnightly Planning Sheet

Sr. No.	Date	Activity planned	Activity Executed	Sign of Students	Sign of Guide

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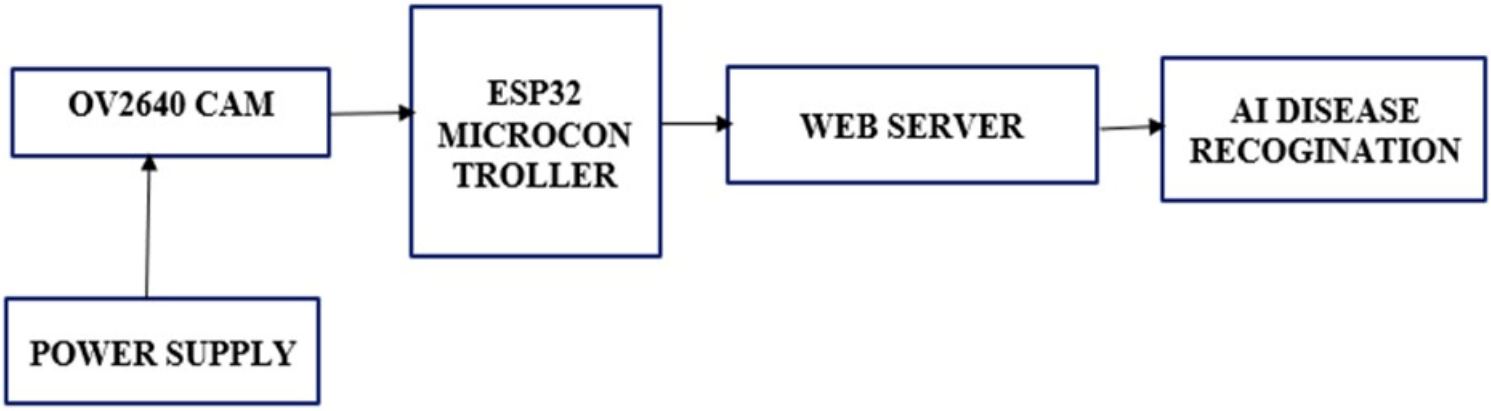
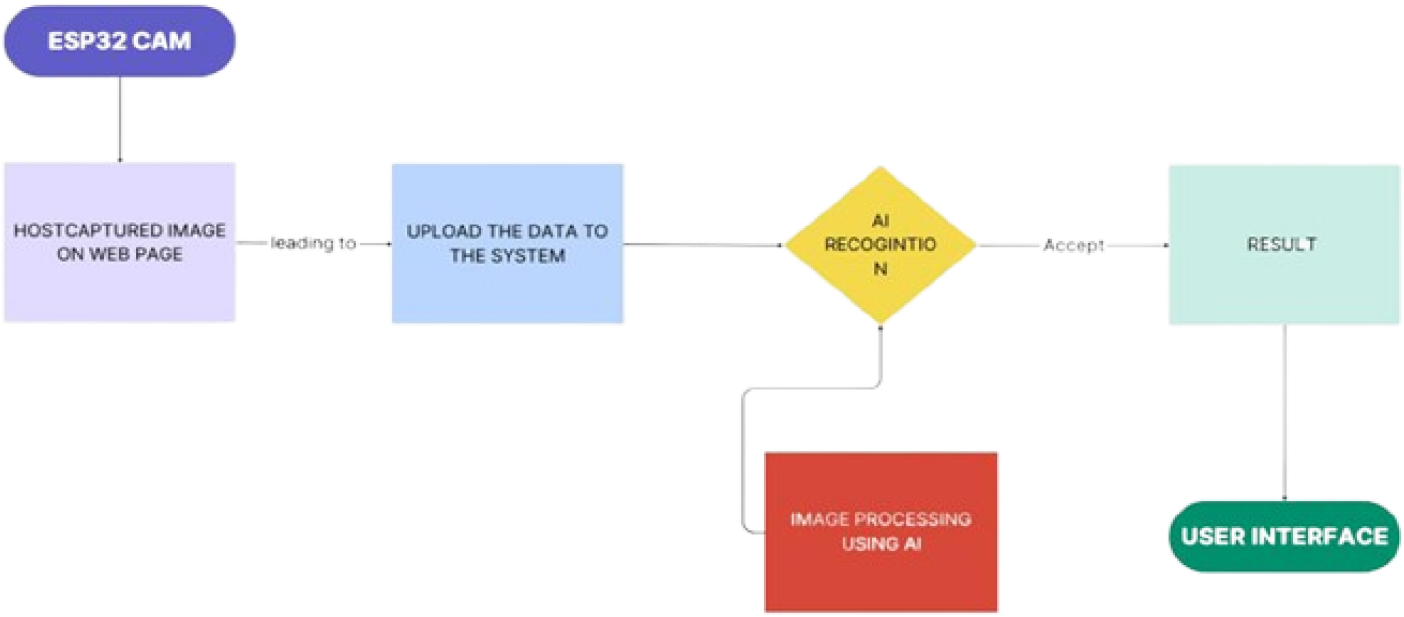
Block Diagram



Flowchart / Algorithm



Rubrics for Evaluation of Project Exhibition

Parameter	Criteria	RATING			
		Average	**Satisfactory**	**Good**	**Excellent**
		1 or 2	**3**	**4**	**5**
Project Idea / Theme (CO1)	Creativity	Common idea and basic implementation	Simple idea and simple implementation	Simple idea but implemented innovatively	New project idea and implemented innovatively
Literature and Market Survey (CO1)	Coherence	Very limited Literature and Market survey	Literature and Market survey carried out , but able to explain some of them	Literature and Market survey carried out, but able to explain most of them	Appropriate Literature and Market survey, able to relate it with project parameters
Hardware / software implementation of Project (CO2)	Implementation	Hardware design and software design are partially ready.	Hardware design and software design are ready but results are not proper	Hardware design and software design are ready. Enclosure is yet to prepare. Project is ready with some good features and students are somewhat aware of technical know-how.	The project is ready in all aspects with some innovative features and students are thorough about technical know-how.
Speaking Skills, Presentation, (CO3)	Organization, Presentation Skills	Students are lacking in communication skills Need to improve Presentation skills for effective delivery	Project is ready but students lack in communicating technical know-how of it Few Team members were participated The presentation required slight changes to increase effectiveness of the contents and pace	The transitions and / or flow were somew hat difficult to follow. Team members were mostly audible and / or fluent on the topic	The transitions and flow was easy to follow. Slides were error - free and logically presented. Team members wer e poised and had clea r articulation.
Extension (CO4)	Future Scope	With Minor Changes same implementation can be used for another application	Some changes gives Project Expansion to BE project	The Project Can be converted to Product Level	The Project Can be Patentable

Project Exhibition: Performance Evaluation

Project ID: A23

Project Title: IOT based Plant Disease Recognition System Using ESP32CAM

Remarks:

Minor/ Major Features which can be added for improvement:

Project Presentation: a) Excellent

b) Satisfactory

c) Needs improvement

Name and Sign of Internal Examiner	Name and Sign of Industry Expert	Name and Sign of Project Guide

Dr. Mrs. R. S. Kamathe
H.O.D.

Dr. Mrs. K. A. Adoni, P. M. Chavan
Mini Project Coordinators

Sponsoring Company Data

Project Title: _____

Project ID: _____

Internal Project Guide:_____

External Project Guide: _____

Name of Students: 1._____

2._____

3._____

Name of The Sponsoring Company	
Address	
Office Contact Number	
HR Contact Details (Name, Email-ID, Phone)	
Website	
Work Domain of Company(Product Technology Used)	
Wide Area of Company (e. g Signal Processing, Communication)	

Sponsoring Company Visit Report

Project Title: _____

Project ID: _____

Internal Project Guide: _____

External Project Guide: _____

Date of Visit: _____

Time of Visit: _____

Name of the Sponsoring Company: _____

Progress Discussed:

_____

_____

_____

_____

Project Status (Percent Project Completion & Expected Date of Completion):

Sign of Internal Project Guide **Sign of External Project Guide**

Project Progress Report

Title of Project:-IOT based Plant Disease Recognition System Using ESP32CAM

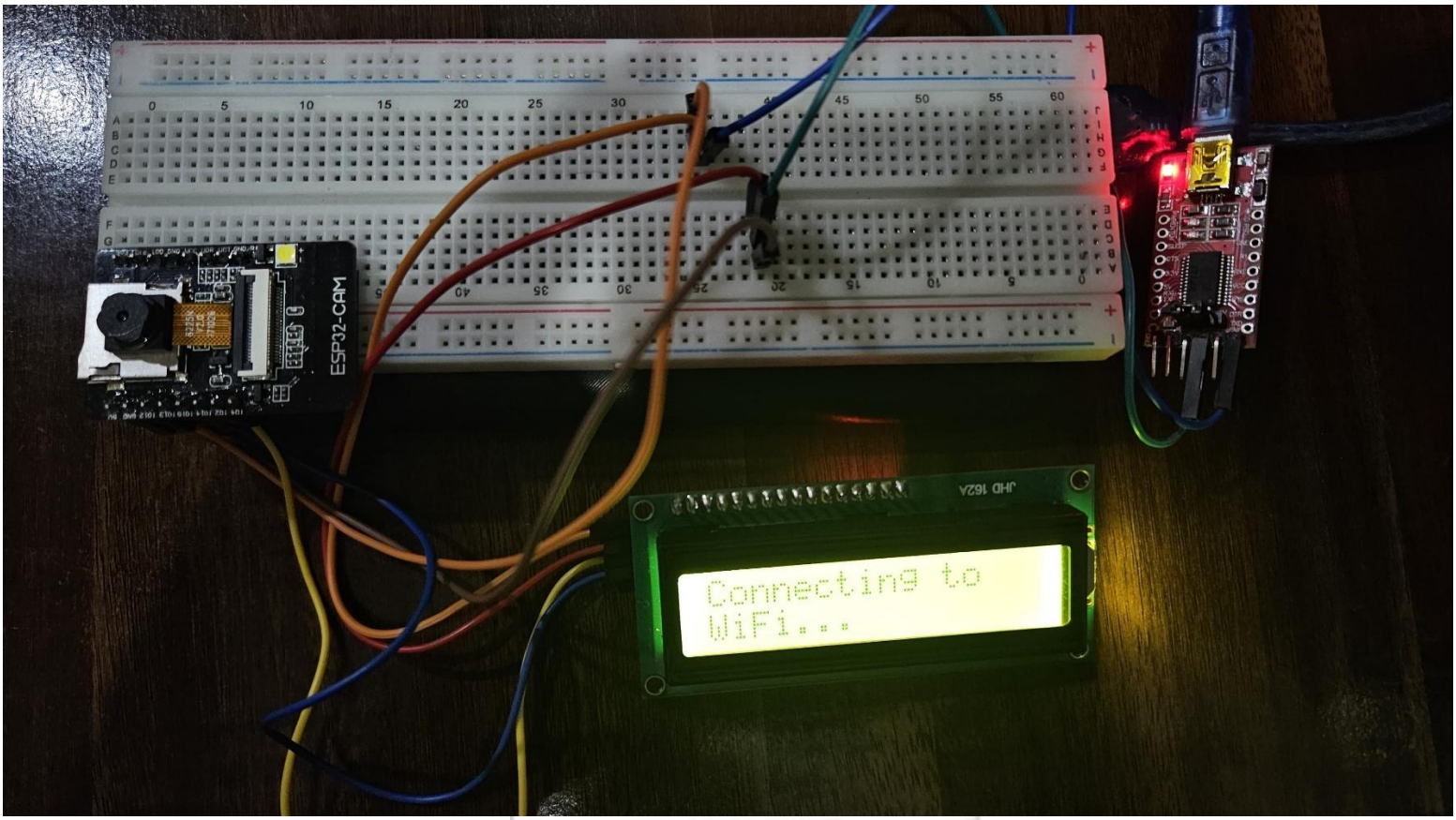
Work Done:-

In this project, we aimed to develop an IoT-based system that can detect plant diseases using an ESP32-CAM module. The work began with thorough research on common plant diseases and identifying relevant datasets for training the image recognition model. We then trained a machine learning model capable of classifying plant diseases based on leaf images. The ESP32-CAM was configured using the Arduino IDE to capture real-time images and connect to Wi-Fi for data transmission. The trained model was optimized and integrated with the ESP32-CAM for on-device inference. A Firebase backend (or a local server) was used to store the detection results and images. To make the system user-friendly, we developed a simple web dashboard for real-time monitoring. An alert system was also implemented to notify users about infected plants via email or app notifications. The system was tested under different lighting conditions and environments using real plant samples. Throughout the development, we maintained detailed documentation and prepared the final project report and presentation.

Achievements:-

we successfully created a low-cost, portable plant disease recognition system that uses IoT and machine learning. The ESP32-CAM module enabled real-time monitoring and wireless data transmission. Our model was able to detect multiple plant diseases with high accuracy. The system is particularly beneficial for farmers in rural areas, providing early warnings and helping in disease prevention. It demonstrates an effective integration of IoT and AI technologies in the agricultural domain. The project was well-received during our college presentation, and the live demo showcased the practical potential of the system in real-world scenarios.

Signature of Students	**Signature of Guide**	**Signature of H. O. D.**


ESP32-CAM
JHD 162A
Connecting to
WiFi...