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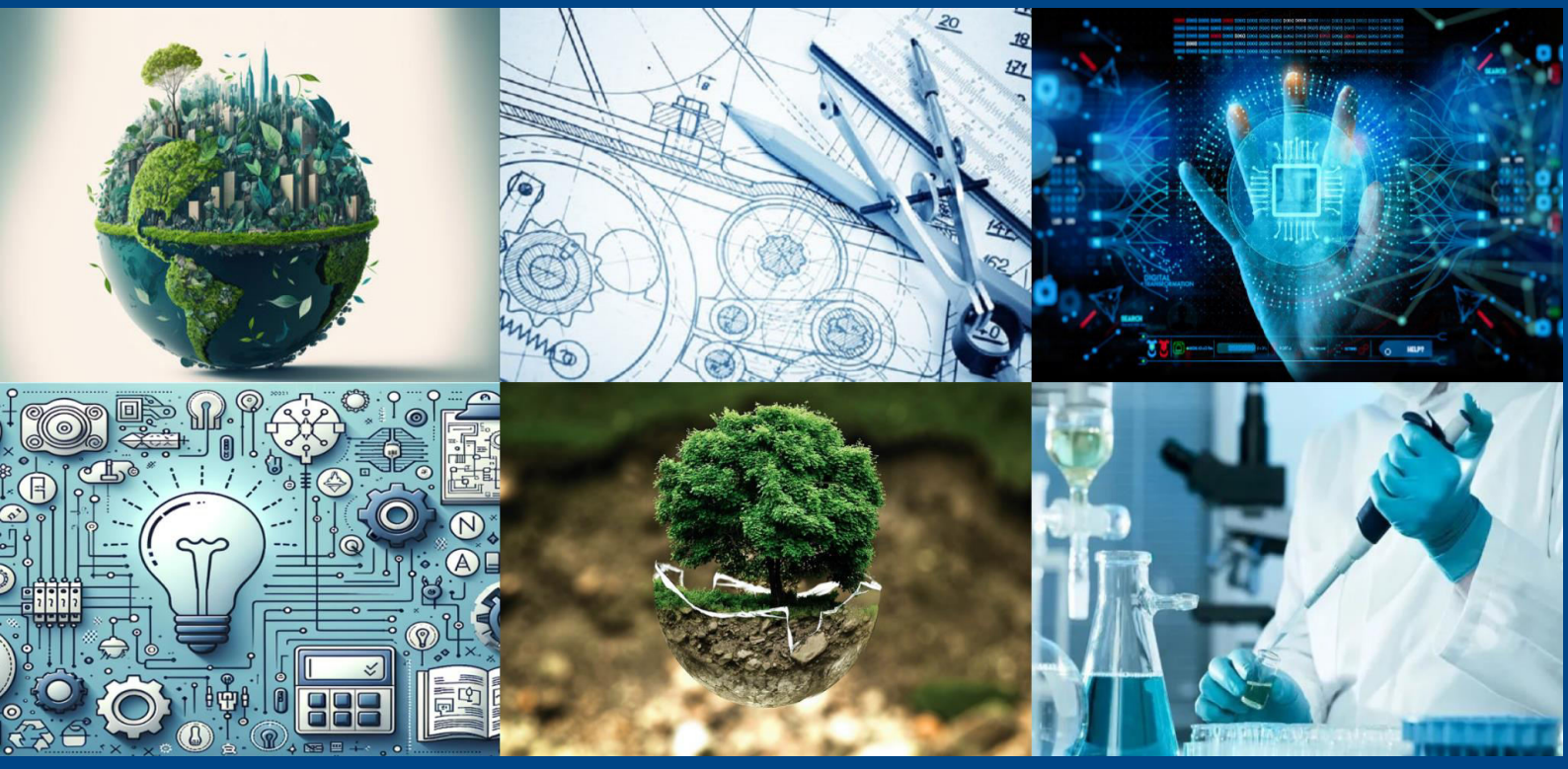

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Integrated Rain and Dryer Sensor System for Home Automation

Vaibhav Golekar[1], Nikhil Swami[2], Zeba Shaikh[3], Atharva Gite[4], Mrs. Z.S.Sajjade[5]

Department of Computer Engineering, Jaywantrao Sawant Polytechnic, Pune, Maharashtra, India[1]

Department of Computer Engineering, Jaywantrao Sawant Polytechnic, Pune, Maharashtra, India[2]

Department of Computer Engineering, Jaywantrao Sawant Polytechnic, Pune, Maharashtra, India[3]

Department of Computer Engineering, Jaywantrao Sawant Polytechnic, Pune, Maharashtra, India[4]

Department of Computer Engineering, Jaywantrao Sawant Polytechnic, Pune, Maharashtra, India[5]

ABSTRACT: The increasing demand for automation in agriculture has led to the development of smart robotic systems that enhance efficiency, reduce labor costs, and improve crop health. This paper presents a robotic system designed for precision farming. The robot integrates remote monitoring, automated pesticide spraying, environmental analysis, and real-time decision-making capabilities. Utilizing cloud-based control and embedded hardware, this system offers a scalable and cost-effective solution for
modern farmers.

KEYWORDS: Smart Agriculture, Agricultural Robot, Automation, Remote Sensing, Embedded Systems, AI in Farming Smart Agriculture, Agricultural Robot, Automation, Remote Sensing, Embedded Systems, AI in Farming.

I. INDRUDUCTION

Our agricultural robot automates farming tasks like crop monitoring, disease analysis, and pesticide spraying, reducing labor costs and improving efficiency. Equipped with sensors, it provides real-time data for better decision-making. Remote operation and future AI integration enhance precision farming, making agriculture more sustainable and productive.

II. METHODOLOGY

The system follows a structured workflow:
1. User Interaction via Cloud: Farmers access robot controls via a mobile/web application.
2. Live Video Feed: The ESP32-CAM streams real-time footage.
3. Sensor Readings: Environmental conditions are continuously monitored.
4. Automated Navigation: The robot follows predefined paths based on operator inputs.
5. Precision Farming: AI-driven insights optimize pesticide and fertilizer application

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III.MODELING AND ARCHITECTURES

Figure 1. Physical Model

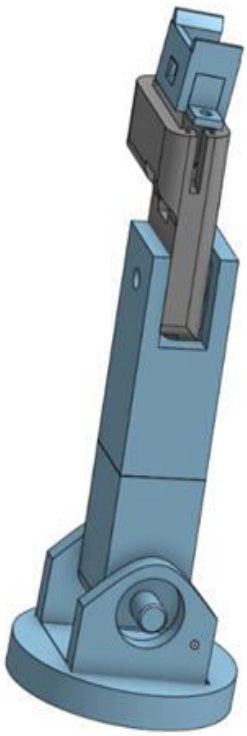

Figure 2. Robot Arm

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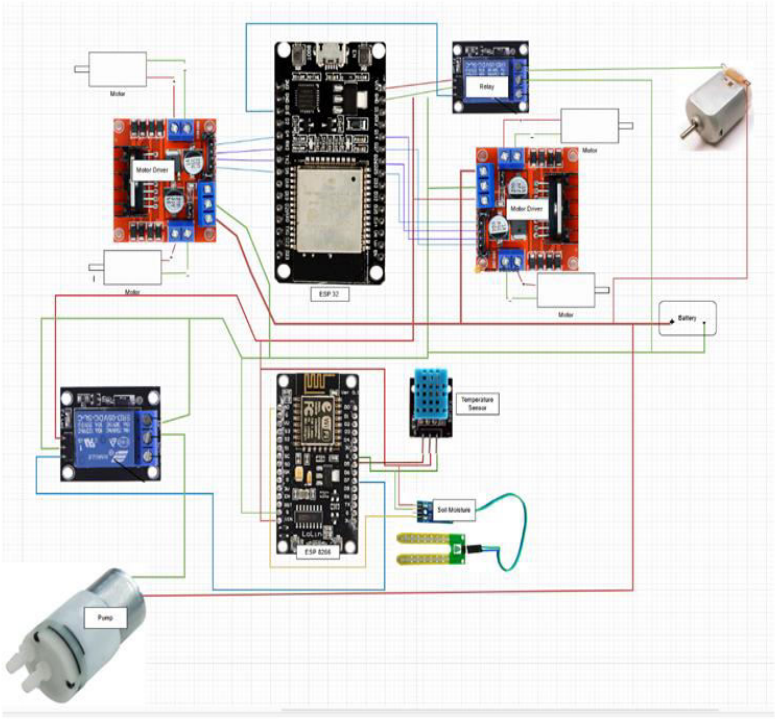

Figure 3. Component Connection

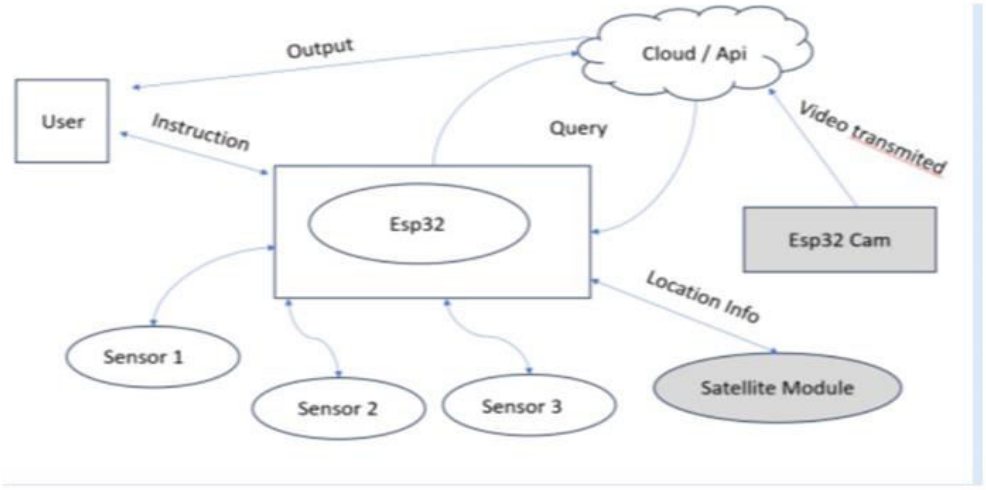

Figure 4. Working of model

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Sr .no	Materials	Description
1	Esp32	For connecting Controller to Robot
2	Motor Driver L298N	For Controlling Motor
3	Gear DC motor	For Navigating
4	DHT22 Digital Temperature and Humidity Sensor	For Temperature Sensor
5	Capacitive Soil Moisture Sensor	For soil Moisture displaying

Table 1. Hardware

Sr .no	Materials	Description
1	Firebase Realtime DB	For Displaying data to android app
2	Gemini API	Image Detection
3	Embedded C	For Programing RealTime Operation

Table 2. Software

IV. RESULTS

Our Project will revolutionary in agriculture sector by new way of farming.

1. low operating cost
2. Farming will be less labor intensive.
3. can Provide weather analysis
4. It can be used in petroleum industry for doing specific task

V. CONCLUSION

Our agricultural robot enhances efficiency, reduces costs, and modernizes farming through automation. It provides real-time data, precise resource usage, and remote control, making agriculture smarter and more sustainable.

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