e-ISSN:2582-7219

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH IN SCIENCE, ENGINEERING AND TECHNOLOGY

Volume 6, Issue 4, April 2023

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.54

International Journal Of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 7.54|

| Volume 6, Issue 4, April 2023 |

| DOI:10.15680/IJMRSET.2023.0604016 |

Agriculture Robot for Spraying Pesticides and Fertilizer's

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ABSTRACT:- The agriculture sector is one that requires a lot of labour and resources. As a result, farmers are using technology more and more. Using automation to deal with the problem. However, agricultural robots are too expensive, slow, and intricate to be made widely available. As a result, the agriculture industry continues to be slow to adopt new technologies. This academic paper describes the creation of a low-cost agricultural robot for general crop spraying and the application of fertilizers and pesticides in agricultural field monitoring the two-wheeled robot in the prototype system has a mobile base, a spraying mechanism, and a wireless controller. a camera for monitoring crop health and growth as well as spotting pests, and a controller for moving the robot.in the realm of agriculture. Tests Research on the prototype system reveals that although the robot's crop coverage productivity is marginally lower than that of a human worker, the labour cost savings provided by the agricultural robot prototype are much greater because it operates entirely in an autonomous mode and only needs the operator to control it when positioning it at the beginning of the crop path. Additionally, the prototype system achieves precision agriculture objectives by allowing for greater resource savings and a decrease in the contamination of underground water sources brought on by the leeching process. Finally, the prototype system's long battery life guarantees that the procedure of applying fertilizer and pesticides won't take longer and be less effective as a result. To the times of recharge when human workers are replaced. To further minimize labour needs and expenses, future recommendations call for making the agricultural robot entirely autonomous using either a rail- or line-following technology.

Software : (Ardino IDE)

KEYWORDS: RF Relay, IP Address, ATmega328P.

I.INTRODUCTION

In order to address a variety of urgent issues facing the agriculture sector, including the growing global food scarcity and the shrinking agricultural work force , farmers are increasingly turning to technology. Farmers can concentrate on raising crop yields by automating tedious, time-consuming, and tedious jobs with agricultural robots, which increases Increasing farm productivity while lowering labour costs and total operating expenses .Precision agriculture, which more effectively distributes resources, is made possible by agricultural robots and results in significant resource use reductions. Modern crop

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harvesting and picking
processes, weed control, mowing, sowing, as well as sorting and packaging agricultural produce, all use advanced robotic systems. One area where using robots in agricultural operations makes the most sense is the pesticide and fertilizer spraying. Crops need to have regular applications of pesticides and fertilizer to maintain yields. The use of knapsack sprayers by employees to manually apply pesticides and fertilizer to large agricultural fields is a technology from the past that is not only time- consuming and very inefficient, but also results in significant labour expenses. Large storage reservoirs may be carried by spraying robots for fertilizer and pesticides, which can also work securely and even independently. These robots can also be deployed for a fraction of the price of more conventional techniques. In comparison to human workers using knapsack sprayers, it is believed that agricultural robots can spray fertilizer and pesticides with up to five times less labour . There are numerous agricultural robots that can perform some of these tasks. are currently on the market, and many more will do so soon. Agricultural robots, however, are now far too expensive, slow, and difficult to use for the general people. As a result, despite the fact that Malaysia's agriculture industry significantly contributes to the nation's economy, it continues to be run in a traditional manner and lags behind in integrating cutting-edge technologies like agricultural robots because of the high cost of such systems. The goal of this project is to create a low-cost agricultural robot that can spray pesticides and fertilizers on farmland. The fertilizer and pesticide spraying robot prototype was put together using straightforward, inexpensive, off-the-shelf parts to keep expenditures to a minimum. Robotic farm equipment created for this study two application spraying pesticides and fertilizers as well as general crop
monitoring are the focus of the effort. The prototype system is a two-wheeled robot that includes a mobile base, a wireless controller for man overing the robot, and a camera that transmits a live video feed for monitoring overall crop health and growth as well as spotting pest activity in an agricultural area.
The agricultural robot follows the instructions of an operator to function.

II.LITERATURE REVIEW

P. Usha[2] formulated that a method of cultivating agricultural land without the use of human labour is being established using the robot device. The purpose of the article is to reduce people, time, and money while enhancing productivity In their paper, "Application of Intelligent Control in Spraying Pesticide Simulation System.

Xu Chengzhi, Liu Pingzeng, Bai Xueming[3], HouYingkun, and Xu Jian proposed that, On the basis of configuration embedded software studies, Smart control simulation model is given for the spraying of pesticides. The wireless network of information collection in the system is made up of a variety of terminals that connect to the upper device through a specific NC network.

In their article "ARM[1] - Based Pesticide Spraying Robot," Dr. S.R. Gengaje and SnehalM.Deshmukh proposed the implementation of the premised agricultural robot, where the robot continuously scans the plant. Robot-mounted wireless camera that records cropped footage and transmits it to the central station. The person sitting at the central station decides on the robot's operation V. Maheswari.

III.METHODOLOGY OF PROPOSED SURVEY

According to our literature survey we seen that, so many advanced techniques can be used to Farmers Work Easily for spraying pesticides and fertilizers. The ESP32 camera module utilizes Wi-Fi. As a result, it can receive wireless commands through IP address. The ESP32 then sends the command to the motor driver after receiving it via a web browser with the same IP address. The motors are then turned by the motor driver, creating motion. The ESP32-camera module can wirelessly feed video from the camera back to the browser at the same time. Then, using the On/Off button, we can turn on the main project application. One RF Transmitter and one RF Receiver are present in our system, as indicated in the block diagram. When you press the button (located on the transmitter remote), the pump will automatically latch and start. In order to bypass the relay, the pump wire is installing this pump on a tank. We may use a 9 volt power source for the controller and relay, and a 6 volt power supply with an ESP CAM and L298N module to control the movement of the robot. Controlled by RF relay, if the relay is on, the pump will start and pesticides will spray automatically.

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IV.BLOCK DIAGRAM

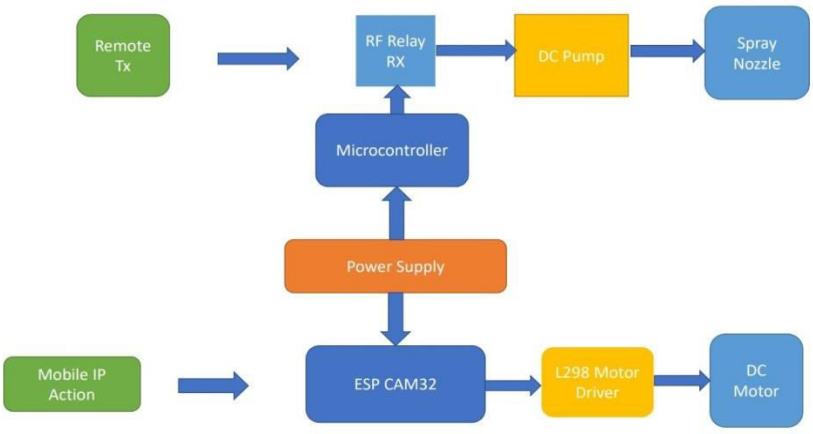

Figure 1. Basic Block Diagram

V.CIRCUIT DIAGRAM

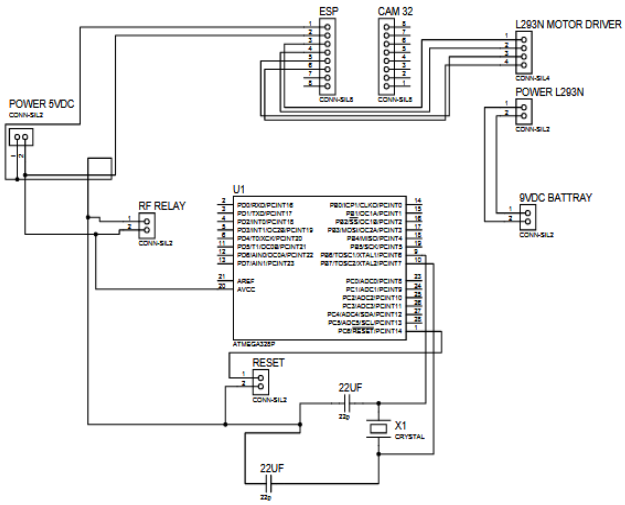

Figure 2. Circuit Diagram

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VI.COMPONENTS

6.1 AT mega 328p: ATmega328p is a high performance yet low power consumption 8-bit AVR microcontroller that's able to achieve the most single clock cycle execution of 131 powerful instructions. The ATmega328p is a popular microcontroller due to it being a major component in the Arduino board products.

6.2 Relay: Relay are used here to operate aour devices which are having a high voltage devices. There are 1 relay of 5VDC we are using.

6.3 Crystal: The 16 MHz crystal oscillator circuit sustains oscillation by taking a voltage signal from the quartz resonator, amplifying it, and feeding it back to the resonator in our project. It provides clock pulses of 8 MHz frequency. The popularity of the crystals is due to the low cost.

6.4 Power Supply: Power supplies can be used to control the robot's wheel as well as the ESP CAM 32 for image processing or live streaming on a farm.

6.5L293N Motor Driver Module: This module serves as a circuit for a motor driver. This module has 4 connections for coils one and two and a 12 volt power source. These pins are linked to the ESP CAM32

6.6ESP CAM 32:ESP Cam32 this camera is used for controlling the robot wheels and live streaming this streaming is available on Mobile IP.We get one IP for this ESP Cam we can hit this IP on browser and controlling the robot wheel.

6.7DC Pump: DC water pumps are small pumps that are powered by a battery or other dc power source. Their main use is to circulate liquids (such as pesticides and fertilizers), and they are especially helpful in areas where water is Scare.

VII.FLOW CHART

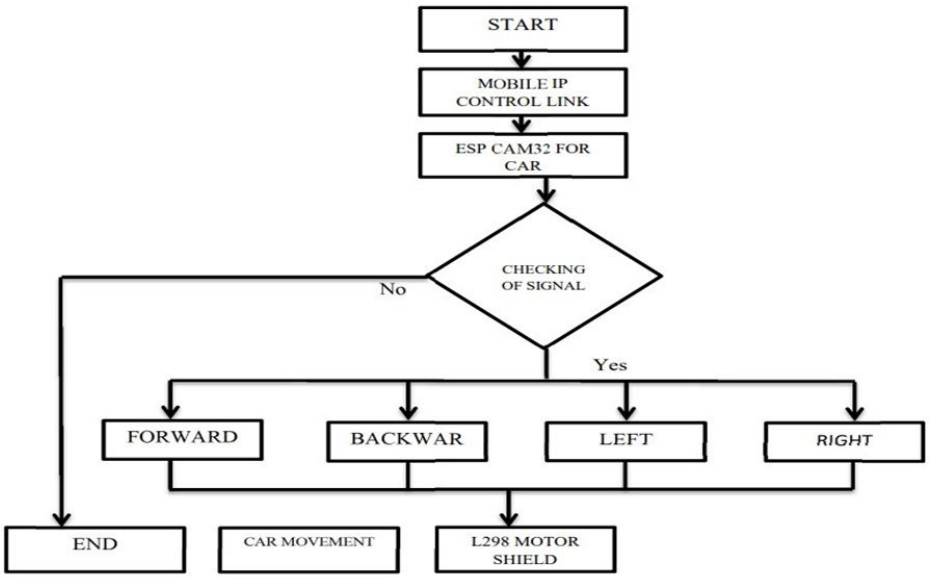

Figure 3. Design Flow Chart

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VIII.RESULT

This agricultural robot reduces farmers' manual labour while increasing the efficiency and accuracy of the task. This robot was developed to increase application yield and precision.Atmega328p is utilized as a microcontroller. The live video motion, spraying impact, and robot movement are all controlled by the ESP CAM32. Applications like pesticide spraying and fertilizer spreading are highly challenging. Although spraying pesticides is now required, it still continues to be a risky process for farmers. In this project, an ESP CAM 32 microcontroller is used to drive a robot using a mobile application. This affordable robotic vehicle can increase labour demand, safety in agricultural applications, and productivity.

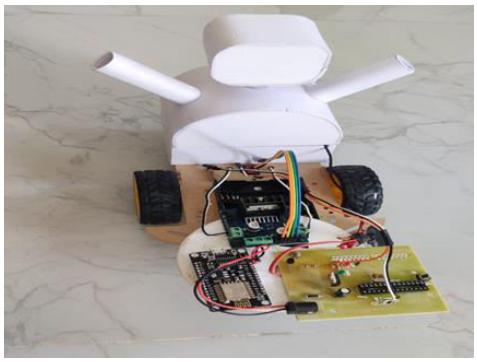

Figure 4. Project Model

IX.FUTURE SCOPE

This agricultural-based vehicle shows that it is a practical, effective piece of machinery that is easy to use. The robot can move through a range of ground types and surfaces. The task becomes unmanned when its complexity is reduced from being human. Artificial intelligence and machine learning will be used in future advances to automate control.

X.CONCLUSION

We have successfully put the Agriculture Robot For Sprayiong Pesticides and fertilizers.The IP Can works well to control the Sprayer. Even the real-time system feel is a complete success thanks to all technology for spraying pesticides on our farm.

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Impact Factor
7.54

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

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