SMART AUTOMATED PESTICIDE SPRINKLING ROBOT

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ABSTRACT:

For a long time, agriculture has been the main industry in our nation. But there are currently obstacles in agriculture because of the migration of people from rural to urban areas. Therefore, we use Internet of Things-based smart agriculture solutions to solve this issue. This project has a number of characteristics, including security, appropriate watering facilities, moisture and temperature sensors, GSM-based remote controlled monitoring, and intruder frightening. It uses wireless sensor networks to record the characteristics of the soil. Different sensor nodes are placed across the farm at various points. Sensors, cellular data, cameras, and microcontrollers are interfaced to perform operations, and these parameters can be controlled by any remote device or internet service. This idea is developed into a product and provided for the wellbeing of farmers. **Keywords- IoT, Agribot, Sprayer, Pesticides, wireless controller**

INTRODUCTION:

The majority of Indian states have agrarian economies, with rural populations relying mostly on agriculture and animal husbandry for their subsistence. Numerous types of agricultural robots have been suggested and built with the goal of boosting crop productivity while decreasing the amount of work required. This robot is capable of carrying out simple tasks like spraying insecticides. Investments in precision agriculture have increased due to the use of agricultural machinery. The robot begins by tilling the ground and then spraying insecticides. Basic parts including sprinkler pump, relay, GSM motor driver circuit, intruder sensor, DC motors, 7805, and SST as the primary controller are used. The robot has a straightforward mechanical design as well. It is designed to perform the aforementioned task concurrently. Robot has a sprinkler- equipped sprayer that is relay-controlled. The use of autonomous devices to do agricultural activities under guidance and control is known as precision autonomous farming. It drives robotic agriculture. Using robotics technologies in agriculture is not the only objective of agricultural robotics. The IOT has the capability to capture a picture if it detects any intrusion.

LITERATURE SURVEY:

Development of A Wireless Surveillance Robot For Controlling From Long Distance It has been possible to construct a robot with multiple applications linked to security and surveillance systems. Ground testing of this robot has revealed that, because the system is based on the World Wide Web (www), it can be operated from any location. Additionally, this robot uses radio frequency (RF) teleoperation for signal processing. It has been discovered that when a

steady 512 kbps Wi-Fi internet connection is used, this robot operates at roughly 78% efficiency. For robot control, Visual Basic software has been utilized. The robot has four cameras attached to it so that it may take pictures of its surroundings. Several of these camera photos are displayed simultaneously using vmcap software. The user's monitor will receive and display the images captured by the four cameras and the control panel. Software for virtual network computing, or VNC, has been used for this. The user can manage the mobility and gain an understanding of the surroundings by viewing the situational photos given by the remote robot. A GPS (Global Positioning System) device is affixed to the robot in order to obtain a complete track map and a satellite image of the mobile robot's motion trajectory. The methods and capabilities of the aforementioned robot are described in this study. Index Terms: picture transmission, long- distance control, wireless communications, teleoperated robots, surveillance robots.

Design and Implementation of Remote Operated Spy Robot Control System

Robots having cameras that can be controlled remotely and send video footage to the intervention squad are known as spy robots. They are designed to be transportable because they are small and compact. Using PIC 16F628A and PIC 16F877, the project in this paper assumes a moving spy robot controlled by a remote controller. The spy robot is composed of four moveable wheels, an antenna, batteries, and a wireless camera. The two distinct PICs are utilized for controlling a spy robot and a wireless system remotely. A CCD camera is used to record the environment around the robot. On the remote controller, a 4-bit LCD display is installed to view user commands. The CCD is configured with LEDs connected by a lighting circuit in order to use the spy robot in a pitch-black environment at night. The wireless remote control system uses radio frequency module signals to send and receive wireless logic signals that are utilized to control the motors of the spy robot control system. The Remote Operated Spy Robot uses two L298N and three Brush DC motors. The brush DC motors are driven by L298N, respectively.
The term "Remote Operated Spy Robot" refers to a tiny robot used in this study for inspection, surveillance, and espionage activities.

War Field Spying Robot with Wireless Camera and Firing System:
A report on a robotic vehicle that can be operated remotely via a TV or smartphone app and has a wireless camera mounted for monitoring. Real-time footage can be wirelessly transmitted by the robot and camera. This type of robot can be useful in conflict zones for espionage purposes. The intended operation makes use of a microcontroller from the 8051/PIC series. Commands are transferred from the transmitting side to the receiving side using an Android application device to control the robot's movement, including forward, backward, left, and right movements. Two motors are interfaced to the microcontroller at the receiver side and used to move the vehicle.
Any RF transmitter and receiver can operate remotely. After input data is analyzed, the microcontroller uses a motor driver integrated circuit (IC) to regulate and operate DC motors as needed. Using an infrared signal, a wireless camera attached on the robot body allows for surveillance even in total darkness. A firing mechanism is also included in this proposed system to fire the target object. The suggested system can accept remote location camera video input.

When a person is spotted and appears to be an enemy or terrorist, the controller receives this information and uses it to fire the gun at the target item by simply pressing the fire button on the remote. The robot can move up, down, left, or right to seek for the target object.

Internet of Things (IoT) based Pesticide Spraying Robot - A Revolution in Smart Farming

To develop an IOT-based spraying robot that uses less pesticide and is safer for the environment and people. Methods: The recommended approach makes use of the ARM7 controller and robotic platform. Findings: Our robot is not only better at spreading pesticide over a longer distance (50 meters), but it also uses less power (3.3 V only), can carry a comparatively large amount of weight (three liters), has optimal control navigation, and—most importantly—is practically feasible to build for less than $250 USD, according to a quantitative comparison with recently proposed spraying robots.

Novelty: Since Bluetooth controls the robot, pesticide treatments can be planned entirely through Bluetooth. In response to a precise command to the controller, the pump will turn on wherever the farmer wants to spray pesticides. The robot may be made to go forward, backward, right, left, or stop by giving it commands.

Implementation of pesticides sprayer by using iot.

With so many gadgets connected to it these days, the internet is expanding greatly. The idea of "smart farming" has been introduced to agriculture by the Internet of Things. It functions well in the various areas of agriculture, including time management, water management, and pesticide and insecticide control. By applying smart sensors to agriculture, it also reduces the need for human labor and streamlines farming procedures. Along with saving farmers' time, it also lessens wasteful use of resources like water and power. Our project's main goal is to protect crops from insects, mites, nematodes, and gastropod mollusks by spraying pesticides. It can be operated remotely via a smartphone application while seated in one location thanks to IOT technology. Additionally, it lessens the effort required of the farmers and is easily accessible from any location, working well on a variety of terrain. Our project's main goal is to protect crops from insects, mites, nematodes, and gastropod mollusks by spraying pesticides. It can be operated remotely via a smartphone application while seated in one location thanks to IOT technology. Additionally, it lessens the effort required of the farmers and is easily accessible from any location, working well on a variety of terrain.

Design and Implementation of Pesticide Spraying Robot using IOT

India is mostly an agricultural nation. Pesticide application is a crucial duty for all farmers. Farmers employed hand pumps or fuel-operated spray pumps for this purpose in the past, but the carbon dioxide these pumps release into the atmosphere while they are operating had a negative impact on the ecosystem. Additionally, there is a possibility that pesticides will come into direct contact with human tissue and cause injury. Therefore, there isn't much

appreciation for these cautious sprayers. This research used a raspberry pi to construct a robot that sprays insecticides. How fossil fuels worked Noise and vibrations are reduced since the DC pump removes sprayers. As a result, the spraying system is green. A car that is electrically operated by a remote (mobile app) is created to put the concept into practice. The robot has a sprayer installed so that it can quickly and evenly treat a wide area with insecticides. This paper's primary benefit is that the sprayer height may be adjusted based on the height of the plant.

Agricultural pesticide spraying robot

The goal of this project is to develop an intelligent spraying robot that will reduce the usage of pesticides and harm to human health, protecting farmers and requiring less labor. Complete route planning and navigation systems, driving control, a spraying mechanism, system construction, obstacle avoidance, and the integration of several sensor modules will all be features of the robot. The design of the spray robot will include simulations and analysis for sensor integration, obstacle avoidance, and spraying In order to achieve strong stability and dependability, it is utilized not only to track motion and monitor orientation but also to adjust for path errors. In the interim, the spraying system will be enhanced with automated sprays that adjust based on the target in order to remove leaks and avoid repeated spraying. The pesticide spraying strategy that this study suggests will assist farmers in the agricultural sector.

Iot BASED AUTOMATED PESTICIDE SPRAYER FOR DWARF PLANTS

A primary objective is to design an automated pesticide sprayer that reduces the ranchers' need for hand splashing by using an ESP-based remote communication system. Our daily lives are heavily influenced by farming. The standard methods involved either a portable vehicle with an integrated blower and sprayer unit, or a single sprayer and a physical switch to generate and siphon the pesticide through a cylinder. Another major drawback of human labor frameworks is that they expose the administrator with harmful synthetics while splashing, which is extremely detrimental to the administrator's health. Ranchers carry heavy tanks on their shoulders, which presents a number of challenges when it comes to herbicide splashing onto crops. Pesticides should be sprayed on crops in all seasons, regardless of weather patterns, and they should also allow for a minimum of three to four days to pass after applying the pesticide. Pesticide exposure has been linked to improvements in leukemia (blood disease) and non-Hodgkin's lymphoma (lymph malignant growth), as well as Parkinson's disease, asthma, attention deficit disorder, and hyperactivity disorder (ADHD). In order to reduce the amount of pesticides in agricultural settings that cause bodily harm to humans and to improve the efficiency of rural splashing activities, this project suggests using intelligent Wi-Fi remote-controlled robots to spray pesticides. Not only may showering be less expensive, but fuel costs can also be reduced. **PROBLEM STATEMENT:**

Among the many difficulties facing modern agriculture is the effective and focused dosing of pesticides on crops. Conventional methods frequently lead to excessive chemical use, which

raises production costs, pollutes the environment, and may be harmful to human health. An intelligent, automated system that optimizes pesticide application based on current conditions is required to overcome these problems. The project's goal is to create an Internet of Things (IoT)- based pesticide-spraying robot that can be remotely monitored and controlled via the Blynk platform. The pesticide spraying system must to have the ability to gather environmental data and modify the settings in accordance with it, guaranteeing accurate and cost-effective pesticide application while reducing the negative effects on the environment.

MOTIVATION

❖ There are a lot of benefits and reasons to use Blynk to build an Internet of Things pesticide-spraying robot. These are a few strong arguments in favor of moving forward with the project.

❖ The robot has the ability to be programmed to identify regions that are prone to pests and apply pesticides exactly where they are needed, hence limiting chemical use and decreasing environmental effect.

❖ By automating the pesticide application process, you can optimize resource usage, leading to cost savings in terms of both pesticides and labor.

❖ Using IoT technology makes data collecting and monitoring possible in real time. By analyzing this data, pesticide applications can be optimized based on the needs of individual crops, increasing yields and optimizing resource use.

❖ Blynk offers an easy-to-use interface for controlling and monitoring the robot remotely. Farmers are able to react swiftly to emergencies or changing conditions because they can access the system from any location.

❖ Larger agricultural regions can be accommodated by scaling the system, giving farmers with different field sizes options.

❖ Such a project encourages the adoption of technology to address modern farming difficulties by showcasing the potential of IoT and automation in the agricultural sector.

OBJECTIVES:

The primary goal of this project is to create an agricultural robot that will assist farmers in automating routine manual tasks like watering and planting seeds. Basically, farmers expend energy, gasoline, or diesel to transport the seeds and water on their own or in tractors, but all of these deviations are eliminated with the aid of this robot. Additionally, it will assist the novice

farmers in self-training by helping them grasp a few technologies. In addition, by deploying an autonomous robot, farmers can utilize it to protect themselves from dangerous insects and pests without having to travel through the farms.

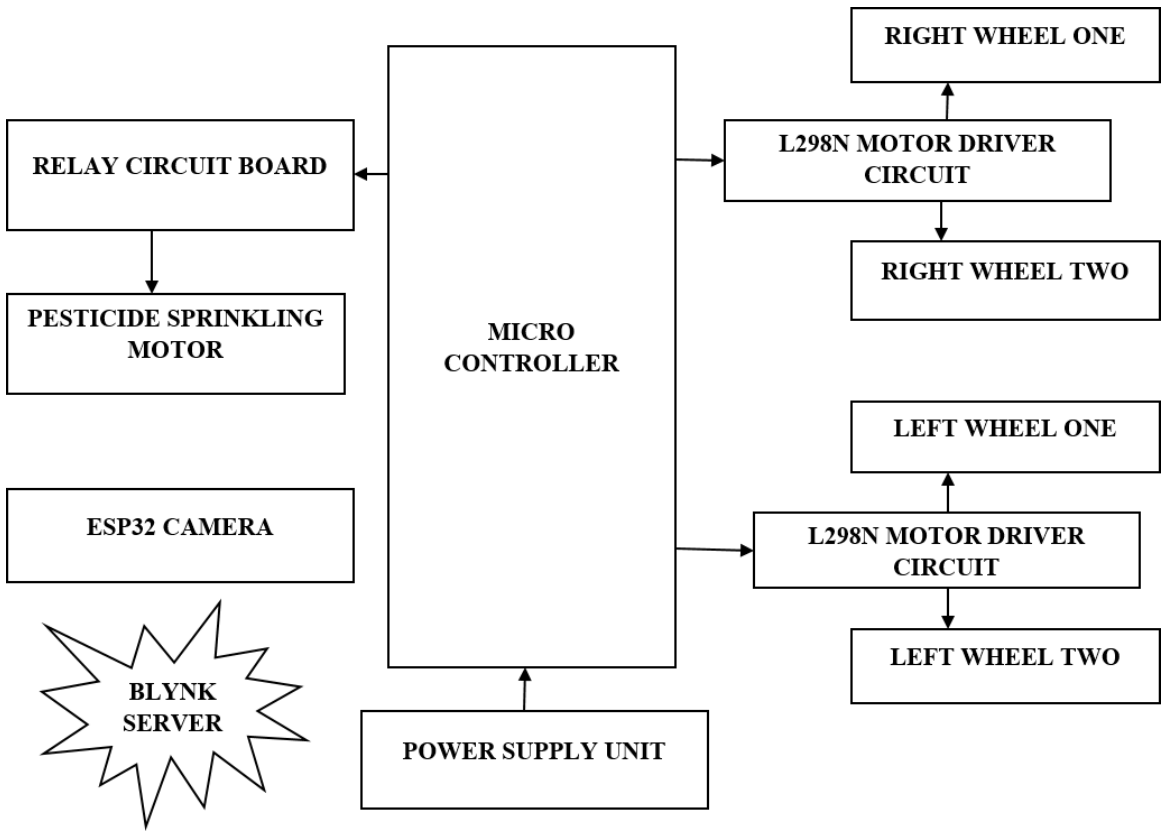
to lessen the farmers' laborious tasks.

- To sit still and apply insecticides to the land efficiently.
- To integrate the IOT technology into farming.
- Creating and implementing the sprayer that mists crops with pesticides.
- To keep an eye on the soil's moisture content.
- To expedite the process of applying insecticides.

SCOPE OF THE PROJECT:

To enable the microcontroller (Arduino Uno) to perform as intended, a C programming needs to be written and coded with the aid of the Arduino IDE.

Functional Block Diagram (METHODOLOGY)



PESTICIDE CONTROL SECTION:

The robot is installed in the farm, turned on via IoT, and has an Android app called Blynk that controls its path. Pesticides can be sprayed with the aid of a pesticide sprinkling pump, and this process occurs on a regular basis when the relay switch is turned on. The system's main objectives were to design, develop, and build an IOT-based agricultural robot with a pesticide spraying system. The agricultural robot uses an internet-based system to control functions such as spraying pesticides. As a result, the system is built on IOT technology, allowing communication between robots and low-cost, open-source Android applications. An ESP32 camera is interfaced to observe live video streaming, and dc motors are used in the system to move the robot. When an object is identified, the user can view live footage and drive the robot in a new direction. With IOT technology, the robot may be operated remotely from any location; its internet connection is the only prerequisite for operation. The motor's positive and negative terminals are supplied with power via the L298N motor driver circuit.

SYSTEM REQUIREMENTS

HARD WARE REQUIREMENTS

- Micro Controller
- Pesticide Sprinkler
- Pesticide Tank
- Dc Motor Drivers
- Dc Motors
- Power Supply

SOFTWARE REQUIREMENTS

- ARDUINO IDE
- BLYNK SERVER

FUTURE ENHANCEMENTS

Integration with Weather Forecasting:

Use up-to-date meteorological information to modify spraying schedules in response to conditions predicted. For example, to guarantee efficient pesticide application, postpone spraying if rain is expected.

Machine Learning for Adaptive Spraying Patterns:

To examine past data on insect infestations, crop growth patterns, and environmental variables, apply machine learning algorithms. Utilize this information to reduce waste and environmental effect by optimizing pesticide dosage and spraying patterns.

Precision Agriculture Techniques:

Incorporate precision farming methods like variable-rate spraying. Determine which locations have different levels of pest infestation using sensor data, then modify the pace at which pesticides are applied.

Multi-Sensor Fusion for Enhanced Decision-Making:

Utilizing sensor fusion techniques, combine data from several sensors (soil moisture, temperature, humidity, etc.). Targeted spraying is made possible by the thorough data analysis, which can offer more precise insights into crop health and insect presence.

Autonomous Recharging and Refilling:

Incorporate self-recharging and refilling capabilities to provide extended operation without the need for human interaction. When the robot has to refill the pesticide tank or recharge its batteries, it can return to a predetermined location.

Advanced Map-Viewing and Navigation:

CONCLUSION:

We have used a robot to spray pesticides in this project. An agricultural robot An Agrobot is a concept that, when refined, could prove beneficial for agricultural spraying operations by increasing the product's cost and effectiveness. Health problems and the workload of farmers are decreased. created a robot that can move over uneven terrain and support a heavy enough compressor and other piece of equipment. successfully building a robot whose structure

is robust enough to withstand the difficulties in the field. Indeed, this innovation would surely help reduce the 15% molality rate seen in Indian formers connected to agricultural spraying activities once it is offered in a way that is suitable for the Indian market. Initiatives such as this encourage people to work in agriculture either full- or part-time. In developed nations like India, where agriculture is the main driver of the economy, this is crucial.

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