ANDROID MOBILE CONTROL SMART PESTICIDE SPRAYING ROBOT

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Abstract - Starting with intelligent spraying robots This will reduce the risk of pesticides and human health By protecting farmers and reducing labor intensity. The The robot will have complete path planning and navigation system, as well as driving obstacle avoidance Driving control, spraying system and multi sensor Module integration. A spray robot will be designed Obstacle avoidance, including spraying and sensors Integration simulations and analyses. It is not used exclusively To track speed and observation orientation, but Compensate for path error to achieve batter stability and During reliability, there will be a spraying system Modified to eliminate leakage and prevent recurrence Spraying, automatic sprayers are changing accordingly The target is proposed and insecticide spraying A system to help farmers in agriculture. This agriculture vehicle proves to be an effective and efficient machine which can be easily navigated and controlled. The robot can traverse a variety of terrains and seils. The android application is used to control the robot's movement as well as spray pesticides. As a result, the robot's contest is simple, and farmers can easily operate this intelige vehicle. The application was built by using MIT app Inventor. This robot focuses on farmers spraying pesticides from a distance without coming into direct contact with them. Becanie the task's complexity is reduced and the manned task is converted to an unmanned task, this feature would encourage some people to take up agriculture.

Key Words: *DC Motor, Arduino UNO, Bluetooth Module, Relay*

1.INTRODUCTION

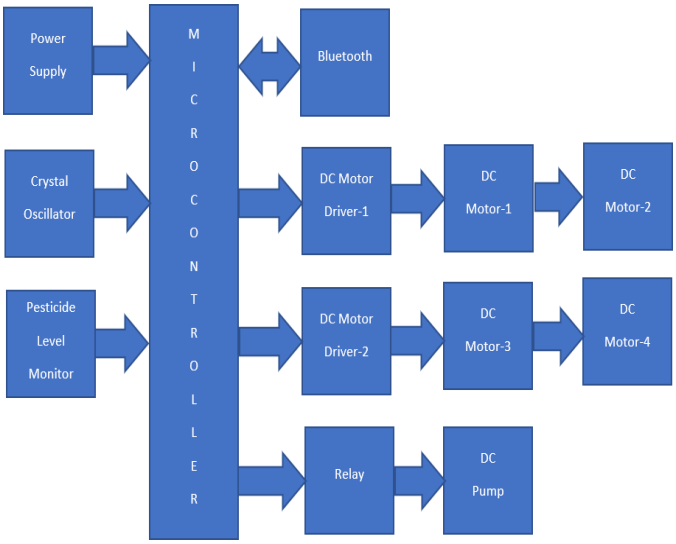
Agriculture is the primary source of income for India's population, accounting for nearly 60% of the country's total population. Farmers work their fields and grow different crops based on the environment and available resources. To meet the high demand for food from such a large population. Farmers should use large amounts of pesticides to increase food production. In traditional manual pesticide spraying operations, the pesticide liquid is fully exposed to the work environment, which causes great harm to the human body and can cause skin cancer and asthma if the pesticide comes into contact with the farmer during spraying. Increased pesticide spraying entering the food chain may affect consumer health. So we designed an automated robotic system that can spray a controlled amount of insecticide when an insect is detected to solve the above-mentioned problem. This not only saves the farmer from life-threatening diseases and physical problems, but also saves him money due to the use of prohibited pesticides. Therefore, farmers help the economic development of the country. The use of this type of robot reduces the time required to spray pesticide liquid and will help reduce the work load on the framers in any season or condition. Surely this idea will accelerate their company to reach new heights and also become more profitable. The implementation of our robot is largely dependent on the awareness of the farmers, which we believe will be easily generated due to its numerous benefits. The proposed objective is to increase the safety of farmers during crop activities such as chemical spraying. fertilizers, and pesticides. The research shows its

relevance in the fields of Agricultural Engineering, Electrical Engineering, Electronics Engineering. Telecommunication Engineering, Mechatronics Engineering, Environmental Engineering. Biomedical Engineering. Mechanical Engineering etc. Detection and tracking of moving objects is used as a low-level function of computer vision applications, such as video surveillance, robotics, authentication systems, user interfaces through gestures, and the pre-stage of MPEG4 image compression as discussed earlier. Rest of the paper Section II covers a brief overview of the literature review, Section III covers the proposed system and the operation of the robot, Section IV covers the results, advantages and its implications. Applications in various fields. Finally, Sections V and VI include conclusions and future work areas that present the implications of the proposed system.

2. LITERATURE SURVEY

The robotics model provides the facility to control the movement of the agricultural vehicle. Plant diseases can reduce the quality and quantity of agricultural products, resulting in serious port-effect situations. Cultivated crops face many challenges including early detection of pests. First steppentails regularly keep a close eye on the plants. Then the diseased trees will be sorted and the affected parts of the trees will be photographed by camera. Pre-processing, transformation and clustering are then applied to the images. The images are then presented to the processor as input and the processor compares them. If the image provided is an affected image, an automatic insecticide sprayer is used to apply the insecticide to specific areas of the leaves. If not, the processor will automatically discard it and the robot will continue on its way. A new wireless robot receiver side is designed to remotely control the necessary commands from the PC section. Based on the written program, independent tasks such as moving the wireless robot to the correct path whenever the robot encounters an obstacle, making some strange noise whenever the wireless robot experiences unknown movement, spraying insecticides, and turning on the electric motor. Moisture is low in crop fields. Created an agricultural robot vehicle that navigates between crops based on the farmer's joystick instructions. The transmitted instructions will be received at the receiver end and the movement of the robot will be determined. This robot will detect insects using image processing and pesticides.

3. BLOCK DIAGRAM



Working:

We create android application to control this spraying rover. First we need to connect Arduino application with bluetooth module HC 05 to control all hardware components of spray rover. We can easily control the spray rover when we connect bluetooth. To this we can add four brushless DC motors with L293D motor driver. Connection of Microcontroller Brushless DC motor is driven by brushless motor driver and powered by 12V battery. Motor drivers are able to manipulate the rotation of the motor using a phase connected gate driver MOSFET on its circuit. Another set of DC motors is

also used here to control the sprayer part of this rover. A DC motor is a rotary or linear actuator that can control angular or linear position. Acceleration with speed and accuracy. The main purpose of these servo motors is to move the sprayer according to the users needs. We used these DC motors as part of the arm to move the sprayer accordingly. Arduino uno board receives commands from android application and acts accordingly. In this system we used a 6V pump. The pump is connected with arduino and gocs through a buck converter and relay module which helps to control the high voltage pump. A relay is a switch that is controlled by an electromagnet. A lower voltage, such as the microcontroller's 5 volts, activates an electromagnet, which pulls a contact to make or break a higher voltage circuit. Here, we have used a 12V battery which is actually high, so we use a buck converter here to convert high voltage DC current to low voltage DC from input to output. The buck converter steps down the DC voltage. The operation of the circuit is determined by the conduction state of the MOSFET: ON-state: the current flowing through the inductor increases and the diode turns off. As energy is transferred from the inductor to the capacitor, the inductor current decreases. In the rover, we have also added humidity sensors and temperature to predict the weather before spraying pesticides. DC gear motor, 100 RPM, 12V, torque up to 2 kg-cm

This DC motor with metal gear head is commonly used in various robotics applications. It has the following electrical and mechanical features.

Features:-

- Used in farms and fields.
- Hardware industries and business units use it,
- Used for gardening Maintain public properties and parka Spray paint can also be used in the automobile industry.
- Provides Agricultural security

Specifications:

PIC16F877A Specs

Here's a few of its specifications:

- Bus width – 8 bits
- Pin Count – 40 (PDIP, SOIC) / 44 (QFN, PLCC, TQFP)
- Program Memory – 14.3 kilobytes
- CPU Speed – 5 million instructions per second
- RAM Size – 368 bytes
- EEPROM Size – 256 bytes

Obviously, the PIC16F877A trumps the PIC16F84A is based on the above numbers. But what separates this microcontroller these are the features:

- 10-bit, to 8-channel Analog-to-Digital Converter (A/D)
- Synchronous Serial Port (SSP) with SPI (Master mode) and I2C™ (Master/Slave)

Motor Type	**:**	DC with Gear Box, Metal Gears
Base Motor	**:**	DC 3000 RPM
Shaft Type	**:**	Circular 6mm Dia with Internal Hole for coupling, 23 mm shaft Length
Maximum Torque:		~3 Kg-cm at 12V
RPM	**:**	100 RPM at 12V

Weight : 130 Gm

Max Load Current: ~330mA at 12V

ADVANTAGES

- Minimizing direct contact of pesticides and human body and improving production efficiency.
- They also work with close tolerances.
- They produce low errors and high speed, and the machine can reliably detect high-quality objects.
- Robots can reduce pesticide use on farms
- Up to 30%.
- Robots have the potential to create jobs for those who must build and repair them.

4. RESULT

This agriculture vehicle proves to be an effective and efficient machine which can be easily navigated and controlled. The robot can traverse a variety of terrains and soils. The android application is used to control the robot's movement as well as spray pesticides. As a result, the robot's contest is simple, and farmers can easily operate this intelligent vehicle. The application was built by using MIT app Inventor. This robot focuses on farmers spraying pesticides from a distance without coming into direct contact with them. Became the task's complexity is reduced and the manned task is converted to an unmanned task, this feature would encourage some people to take up agriculture.

Fig: Project Result

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