

IOT Enabled Pesticide Spray Robot with Solar Powered Gesture Control Device and Disease Detection System

Kavyashree S¹, Vani M², Ranjitha B M³, Santhosha H N⁴, Raju M⁵

¹ Assistant professor, Department of EEE, Vidya Vikas Institute of Engineering and Technology, Mysore, Karnataka, India

^{2,3,4,5} Student, Department of EEE, Vidya Vikas Institute of Engineering and Technology, Mysore, Karnataka, India.

Submitted: 25-06-2021

Revised: 07-07-2021

Accepted: 10-07-2021

ABSTRACT: -One of the important occupations in developing country like India is agriculture. More than 60percent of the population in India, agriculture as the primary sector occupation. It is very important to improve the efficiency and productivity of agriculture by replacing laborers with intelligent machines like robots using latest technologies. Pesticides have virtual influence of the agribusiness. Nearly 35% of crops have been safeguarded from the insects using pesticides. The pesticides are needed for agriculture field to increase the efficiency but they are also injurious to human and also to the environment. This paper deals with the robot which can be controlled both manually and automatically that is automatically by IOT and manually by solar powered gesture control device, along with disease detection of plants by image processing technique.

Keywords: Robot, IOT, Pesticide, Agriculture, Gesture control, Disease Detection.

I. INTRODUCTION

India is the farmland with a population of 3/4 in agriculture. In accordance with the climate and other resources accessible to them, farmers will grow multiple plants in their field. But some technological assistance are required to achieve high output and excellent quality. The increase in the demand of labour in the agriculture fields is increasing day by day as the people now a day are less interested in agriculture so all we need is a robot which can replace humans.



Pesticide spraying plays a key role in protecting the field. Many people are not interested in spraying pesticides as they are getting harmful skin infections and breathing problems also carbon dioxide emitted as pollutant during the operation of such pumps has a harmful effect in the environment. Another important factor is human error which leads to unexpected issues while spraying. For instance,

Due to lack of awareness human labor may spray extra dosage to the plants that leads severe damage to the field. We can find some of the robots available for pesticide spraying in the market but what makes robot presented in this paper different from them are, we are designing a robot which is totally controlled by humans through mobile app using IOT, also that robot can be controlled by using gesture control device.

II. PROBLEMS IDENTIFIED

- If farming field is larger in area spraying pesticides manually is a challenging task for a farmer.
- Finding labourers is a daunting task as agriculture requires more physical work.
- Chemicals used in the pesticide liquids are harmful and dangerous for mankind ,if they don't pay attention during spraying they have to suffer problems.
- Lack of up-gradation into modern tools and technology, usage of renewable resources.
- Intruder activity goes unnoticed by the farmer leading to less security in the farm.

III. OBJECTIVES

- To reduce the burden of farmers in spraying of pesticides to crops.

- To design a mechanism for spraying and construct this machine in such a way that it can travel across any type terrain.
- To make this machine solar powered so that it can be readily charged using the energy required from the sun.
- To protect farmers from health hazards caused by the affect of pesticides.

IV . METHODOLOGY

The affected plants are identified and photographs are obtained for the affected crop component using scanners or cameras. These objects are pre-processed, transformed and grouped. Then images are sent to the processor which compares the images. If the picture is contaminated, an automatic sprayer is used to spray. All these activities are controlled by IOT.

Mechanism for Gesture control:

ADXL335 Accelerometer sensor collects data and sends it to RF Transmitter through Arduino. Then data is transmitted to RF Receiver using Encoder ICs. After decoding the data received, RF Receiver sends signals to the motor driver, which will activate the wheels of the motor. Charging of this gesture control device is done using solar power. System is also provided with the Intruder sensor ,to detect the intruders in the farm and message is sent to farmer’s mobile.

Block Diagram for the proposed system is given below

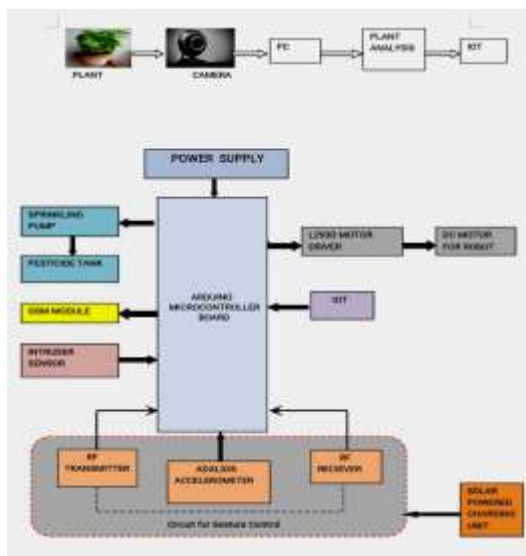


Fig: Block Diagram

Algorithm For Disease Detection:

The block diagram of the proposed the system is shown. Our proposed system will be able to detect the disease and classify it. It requires power supply, raspberry pi3, Internet, E- mail, Raspberry pi camera. In this process, we have to send command to the camera. It is directly connected to the raspberry pi. Using the USB connection, the power supply is being provided. Using tensor flow, the image is being Processed and detected by the raspberry pi.

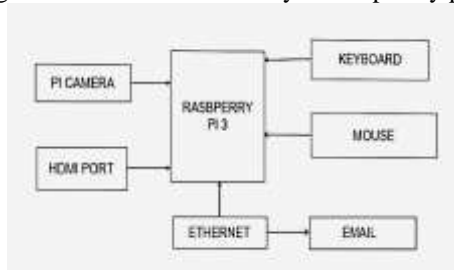


Fig: Block diagram fro disease detection of leaf

V. RESULT AND DISCUSSION

Pesticide spraying work becomes more autonomous with quick transmission of data by using IOT. The user can also navigate the wireless robot in the environment using various gestures commands .The proposed system will detect the Faulty crops and will capture the images of the disease affected leaves and farmers will be able to view the images using smart phones. Intruders will also be detected .Robot will be able to move in any kind of terrain.



VI. CONCLUSION

The use of machine learning and image processing helped to overcome the plant disease diagnosis. This can be controlled from anywhere without working in the field and being exposed to pesticides, it will be a profit for the farmer. It does not require any supervision for operating. It only needs pesticide level refilling, recharging the battery. Solar technology for self-recharge can also be imported in future.

This a cost effective and one time investment project. It saves labor cost which also saves total cost for a farmer. By the removal of the disease from crop, a farmer gets more productive

output which results in wealth maximization of the farmer. This can be said as an advanced step in the agricultural sector, which avoid food crisis, attract the youngsters, and shows the fragrance of agriculture.

REFERENCES

- [1]. Solar Powered Autonomous Multipurpose Agriculture Robot using Android App (2019-IEEE) by B.Ranjitha , M.N.Nikitha ,K.Aruna ,B.T.Venkatesh Murthy
- [2]. Autonomous Adjustable Pesticide Spraying Device for Agricultural Application (2019-IRJET) by J.Rajesh , R.Dinesh , S.Goutham , K.Iniyavan.
- [3]. IOT Enabled pesticides sprayer with security system by using solar energy (2020-IJERT) by Amaresh A.M , Anagha G Rao , Moditha.N , Fenaaz Afreen.
- [4]. Agricultural Automation using IOT (2020-IRJET) by Saima Sadaf , Anupama Shetter , Ranjini D,R ,Nithish Athreyas S.R .
- [5]. Leaf Disease Detection Using Raspberry Pi (2019-IRE) By Laya Yesudas , Santhiya S , Parimala R ,Mohammad Haris.