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MULTI TASKING AGRICULTURE ROBOT

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Abstract

Agriculture is the world's important occupation. The main reason for developing agriculture robot is to improve the food quality. In recent years ,there is a huge development in agriculture like developing of robotic vehicles .Robots are used to decrease human intervation and used for automated seed management , water irrigation, and application of soil based fertilizers, checking soil moisture level. Allowing that robots to work in the farmland , robots undertakes the basic tasks like harvesting, planting and spraying pesticides. In our model a Bluetooth control is connected to identify the crop disease and gives the following such as seeding, watering the irrigation, ploughing, checking the soil moisture level.So these tasks helps the farmer to gain profit and save their time and also it helps to know about the crop disease on time therefore this will produce an increase in their income. Crop disease prediction system assist the farmers in timely detection of plant disease. Robots can work efficiently than a farmer in order to increase the crop production within a short duration.

Keywords: Soil moisture level, Bluetooth Controller, Plant Disease Prediction.

1. Introduction

The main motive for proposing agricultural robot is to reduce the labor effect. Need for improved food quality, Food is one of the basic need that everyone needs to survive their life. This multi purpose agricultural robot helps in maximizing the farmland using minimal resources. Currently agriculture robot undertaking the basic tasks like harvesting, spraying pesticides, planting. In our module blue-tooth control is connected that can sow seeds, water the irrigation, check the soil moisture level and detect the plant disease of the affected crops. Agriculture is a significant employment in India, with a large number of individuals choosing it as a career. With each generation, technology advances, and villages are transformed to urban areas, reducing the number of farmers and the work force that used to assist them in farming. As a result, new technologies must play a critical role in making farming a better and simpler employment in this

circumstance. Robot technology is one example of something that may be employed in various farming chores such as seed sowing, plowing, and other duties, minimizing the need for human labor. As a result, we decided to create a prototype for seed sowing on agricultural land that can identify the number of seed sowing sites and automatically finish the seed sowing path. The prototype produced employs a variety of mechanisms for various farming activities. The prototype digs the soil with a rack and pinion system and drops seeds with a wheel mechanism, all of which are detailed in this paper. Based on the seeding locations, an autonomous seed-sowing robot is created to determine the amount of seeds necessary for the entire agricultural area and sow the seeds according to the farmer's inputs. In general, the most essential aspect of constructing a robot is to follow the steps outlined below in the correct order. To get the best outcomes in the design and implementation of the robot, the workflow process listed below was followed. The concept and prototype for seed sowing activities on agricultural land are presented in this study. It also provides an idea of how to create a comparable robot.

2. **Related works**

In this paper automation of vehicle for ploughing and planting is presented.“Arduino based automation of agriculture a step towards modernization of agriculture”. It has only ploughing and planting system. IEEE CONFERENCE (2020).Bhargav Narayana varam; E.Manoj Kumar Reddy; M.R. Rashmi.

This article highlights the potential of wireless senors and IoT in agriculture, as well as the challenges expected to be faced when integrating this technology with the traditional framing practices.Internet of Things (IOT) based smart agriculture: Toward making the fields talk. It has only irrigation system. IEEE TRANS (2019). Muhammad Ayaz; Mohammad Ammad Uddin.

In this paper, the proposed system using raspberry pi to detect healthy and unhealthy plants& alerts the farmer by sending email. Sensor flow tool is used for numerical computation. It can be used in an controlled environment farms such that it detects the signs of disease whenever they appear on the leaves of the plant. Cost of the raspberry is high.”Leaf Disease Detection Using Raspberrypi”.IRE Journals(2019).The paper aims at making use of evolving technology i.e. IoT and smart agriculture using automation. No solution for plant disease..” IoT Based Smart Agriculture System”. IEEE CONFERENCE(2018). G.Sushanth; S.Sujatha.This paper introduces a concept for smart farming which utilizes wireless sensor web technology for moisture detection in the soil in conjunction with a smart phone application which plays a vital role in helping farmers.Arduino based automatic plant watering system and android application which will help to control arduino via internet.”Smart Farming Using Arduino and Data Mining”.IEEE CONFERENCE(2016).

3. **Proposed method**

In our proposed system, It has two types of working conditions. First part is for digging, sowing seeds, and watering the fields. And Secondly, The system works for irrigation process. all these things are controlled by using a blue-tooth module.In the cultivation process in the front of the robot module has digging hooks and in the backside of the robot will drop the seeds at particular distance gap. In the irrigation process, the moisture sensor will feed the water when ever the moisture level is low. and also it capture the images of the plant and sendto the mail. Afterwards plant disease will be detected using matlab, and results will be updated in the IOT module and the

pesticides will be sprayed in the particular plant or crop.The robot is a mechanical device which is capable of performing various tasks without human intervention.

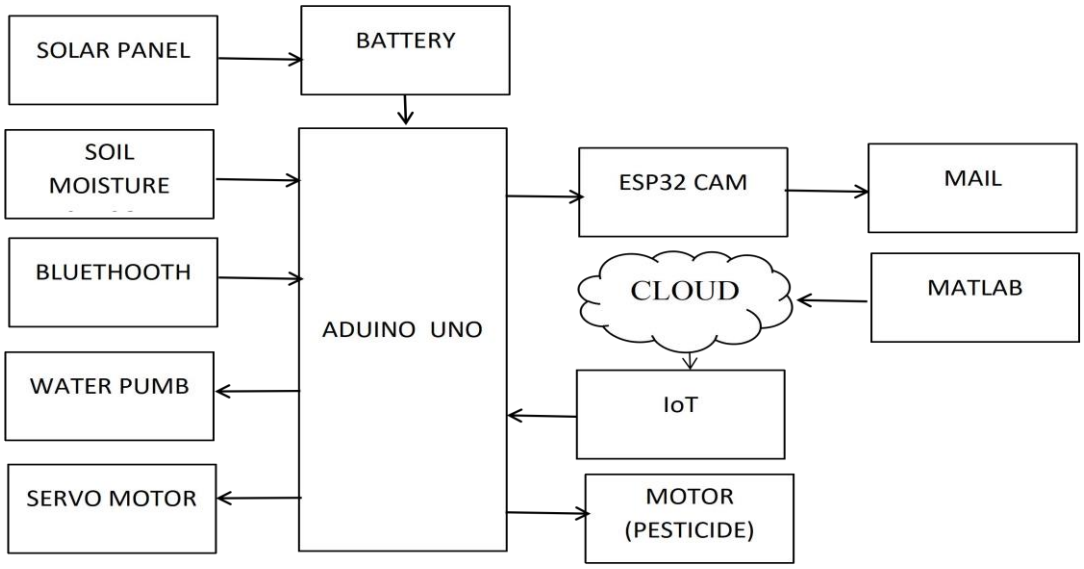

Figure 1. Representation of Agricultural Robot

The robot works based on command given by the controller. Various sensors are used for sensing various parameters along the robotic path. The micro controller being the heart of the robotic systemmanipulates entire the action of the robotic system. It also controls a wheel motion by controlling the Direct Controller (DC) motors. Motor driving circuit isused to drive the DC motors which in turn control the wheel motion. The seedingrobot for agricultural purpose is an autonomous robot which is controlled remotely through a wireless Bluetooth connectivity between the Smartphone andthe robot. The Bluetooth electronics app is used to operate the robot. It is used tocontrol each and every operation of the robot. To ensure a robust and highly repeatable platform, it was decided to base the system on an industrial grade Programable Logical Controller. Figure 1 explains the representation of agricultural robot.

4 RESULTS AND DISCUSSION

The results and discussion obtained by the proposed system are seeding, soil moisture level, soil moisture sensor,plant disease prediction.

4.1 SEEDING

In this section, Figure 2 estimates the seeding process and the irrigation. As the there are two sorts of working situations in our suggested system. The first section entails excavating, seeding, and watering the fields. Second, the system is functional during the irrigation procedure. A blue-tooth module is used to control all of these devices. The front of the robot module features digging hooks, and the backside of the robot will drop the seeds at a specific distance gap during the growing phase. For digging and seeding process servomotor is used. The servomotor rotates

the robot module for dropping the seeds and scounting the soil. The servomotor receives the instructions via bluetooth. Here ardunio and bluetooth are interconnected by the ardunio code.

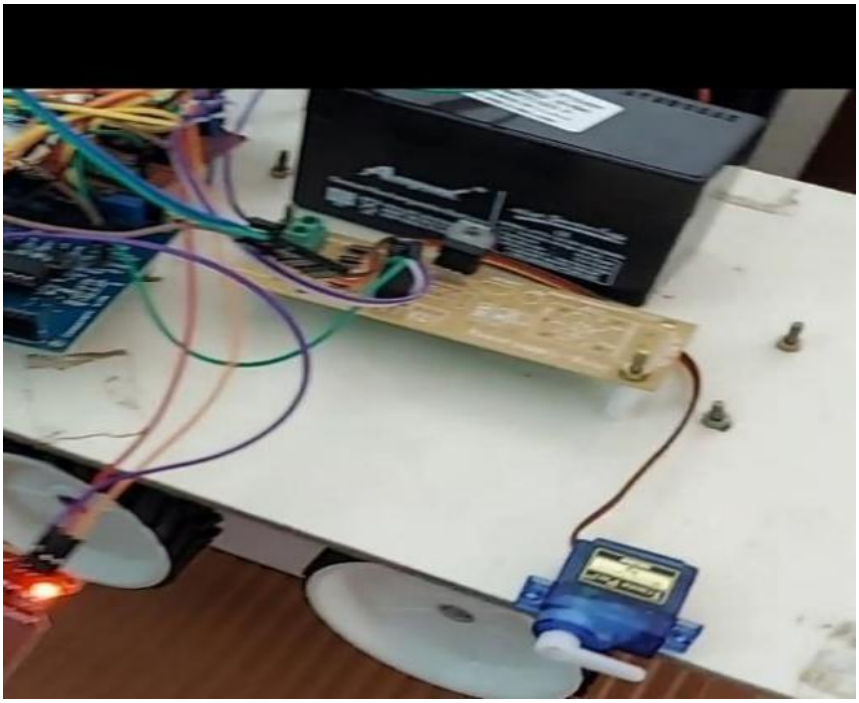

Figure 2. Seeding Process

4.2 SOIL MOISTURE SENSOR

When the moisture level in the irrigation system is low ie. below the range of 300 voltage, the moisture sensor will feed the water, here the IR sensor is transmits the analog signal to the DC motor. This DC motor receives the signal from IR sensor and feeds the water to the soil.

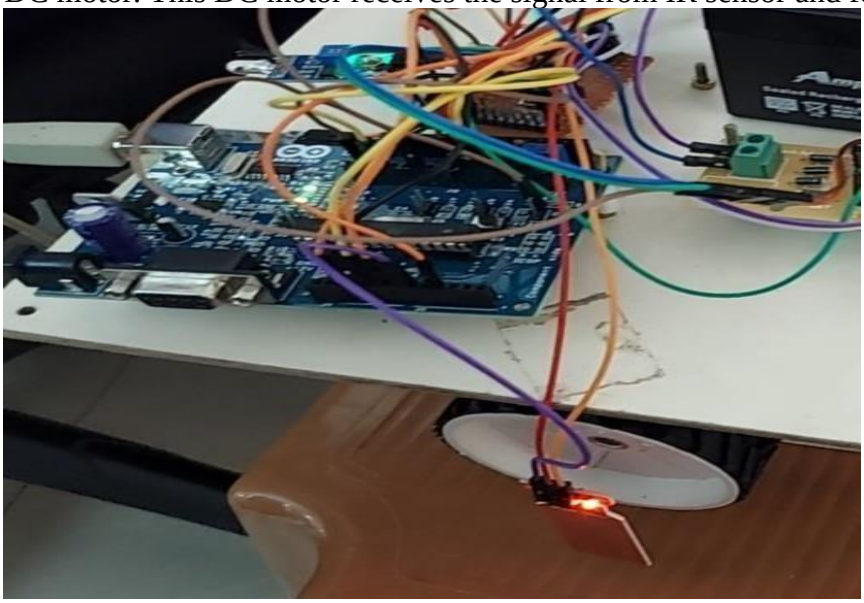

Figure 3. Soil Moisture Sensor

So whenever the water level for the irrigation field is less this process goes on continues. After the water level is normal the DC motor stops feeding the water to the soil. Figure 3 checks the soil moisture sensor.

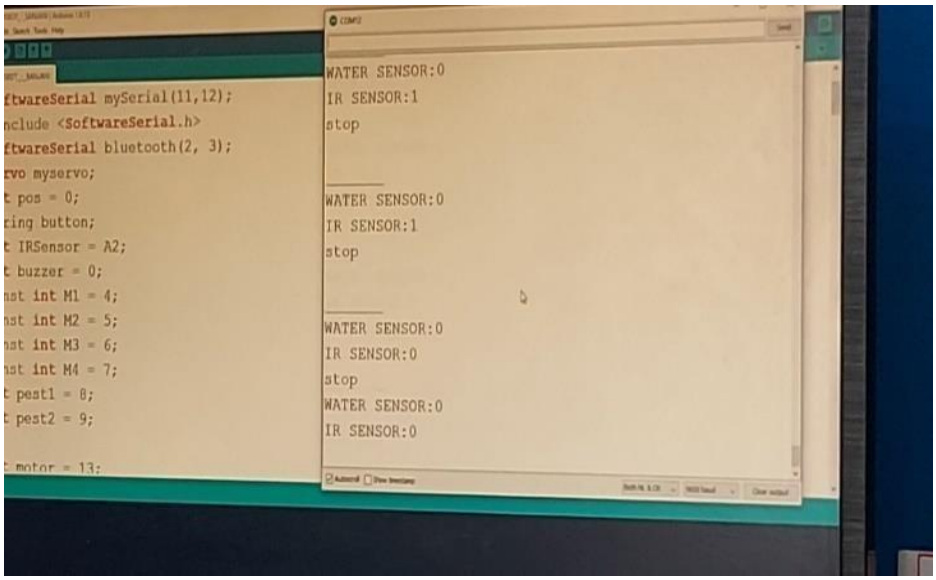

Figure 4 Result of The Soil Moisture Sensor

Figure 4 shows the result of soil moisture level. If the level of soil's water condition ranges below 300 voltage this soil moisture level alerts the message and conveys to water the irrigation field through DC motor.

4.4 Plant disease prediction

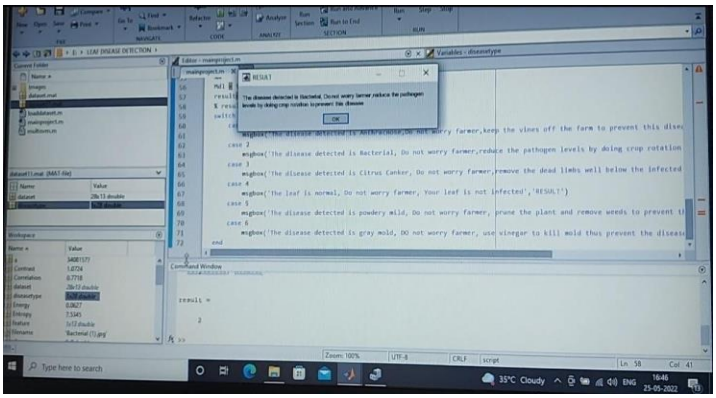

Figure 5. Plant Disease Detection Process

The Figure 5 shows the result of plant disease prediction. ESP32 web cam takes pictures of the plant disease and transmits them to the postal service. Then, using Matlab, plant illness will be recognized, the findings will be updated in the IOT module, and pesticides will be sprayed on the specific plant or crop.Due to the rapid development of digital technology, there is an opportunity for image processing technology to be used in the field of agriculturalresearch which could help

the researcher to solve a complex problem. Image analysis provides a realistic opportunity for the automation of insect pest detection.

5. Conclusion

In this paper focuses on plant disease prediction, we suggest the prediction system for the benefit of crop production. We explore different proposals; like seeding, water irrigation, ploughing and checking the soil moisture level. The main proposal to check the plant disease in the crop. The affected crops are captured by webcam and it is delivered by the blue-tooth module through Email. This model highly helps in saving time and labour cost. It also does periodic assessment of soil. These robots are mainly used in automated weed removal. These robots highly helpful in drip irrigation. Finally we conclude world is moving towards technology. Agricultural robot helps the farmer to have the technical agriculture experience.

"Farmers Make It Grains, Robots Helps It Brain"

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