

Solar Powered Agri-Bot Using IoT with Disease Identification

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Abstract— Agribusiness is the foundation of rural India. Farmers face problems such as lack of timely availability of efficient workforce, as many have migrated from country side. Hence, to reduce the burden of farmers, Robotization in the field of farming is necessary. The robot developed in this work is semi-automatic and will be able to sow seeds based on seed spacing and depth while also regulating watering of plants. The applications of this can range from efficient and intensive commercial farming to using it for research and backyard gardening purposes. The primary purpose for computerization of cultivating measures are sparing the time and energy needed for performing dreary cultivating errands and expanding the profitability of yield by treating each harvest exclusively utilizing accuracy cultivating idea. The robot is able to automatically seed and water, spray pesticides according the path set by the user using the GUI that was developed. The amount of watering is based on the soil moisture sensor reading that is taken between the two plants. We also detect the disease that in plants by using Matlab analysis.

Keywords: Solar Power, Agri-Bot, IoT, MATLAB, Disease Identification

I. INTRODUCTION

Food is the most fundamental need for every being. All through the ages men have strived to create more and better nourishment for developing the food. More land, Better instruments, improved methods, and innovative advances nonetheless, this advancement has had one regular component that has not changed human. Man has consistently been at the focal point of food creation and has now become the restricting element. For a very long time, the main focus of a man is the food creation. As the time goes, the population increasing occurred which demands the increment in the productivity of the food. The advancement in the technology in all the fields to an extent such as development, fabricating, correspondence, workplaces, families, transportation, fighting, investigation and space travel. The interest in Automation Technology in horticulture is driven by different powers: The principle rationale in creating Agricultural Automation Technology is the diminishing workforce, a marvel regular in the created world. The main reason is the requirement for improved food quality and security, for example, computerized examination of rural items for toxins. Computerization can likewise help tackle issues with high volume occasional work, for example, reaping of citrus organic products, grapes, and raisins. A significant piece of Automation is the utilization of robots.

II. LITERATURE SURVEY

A. Automatic Watering and Seeding Using Raspberry Pi

Agricultural Robot for Automatic Ploughing, Seeding And Watering 2015 IEEE International Conference on

Technological Innovations in ICT (TIAR 2015) (Amrita Sneha.A, Abirami.E, Ankita.A, Mrs. R. Praveen, Mrs. R. Srimeena). This paper explains on building a robot equipped for performing tasks like sowing, seed apportioning. It likewise gives manual control when required and watches the moisturity with the assistance of dampness sensors .The fundamental segment here is the AVR At mega microcontroller that regulates the whole cycle. At first the robot works the whole field and continues to sowing, all the while apportioning seeds next to each other. On the field the robot works in an automated mode, however outside the field is carefully worked in manual mode.

“Design and Implementation of Seeding Agricultural Robot” (JIRAS) (P.Usha, V. Maheswari, Dr. V. Nandagopal). This paper describes how can a robot be utilized to build up the way toward developing farming area without the utilization of labor. The point of the paper is to reduce the labor, time and increment the profitability rate.

Automated Farming Using Microcontroller and Sensors (IJSRMS) ISSN: 23493371 (Abdullah Tanveer, Abhishek Choudhary, Divya Pal, Rajani Gupta, Farooq Husain) Farming should be possible utilizing new innovations to yield higher development of the harvests. In this task, we will check temperature, light, moistness and soil dampness in the field zone. The paper here portrays about programmed control highlights with most recent hardware innovation utilizing microcontroller and GSM telephone line. The venture works consequently and henceforth diminishes the labor.

B. Image Processing Using MATLAB

Sachin .D.Khirade, A.B.patil,” Plant disease detection Using image processing,”2015, International conference on computing communication control and automation, IEEE.

The identification of a plant sickness is the way to forestall the misfortunes in the yield and amount of the horticultural item. The investigations of the plant infections works dependent on outwardly detectable examples seen on the plant. Wellbeing observing and illness identification of a plant is extremely basic for maintainable farming. It is frequently very hard to screen the plant sicknesses physically. It requires an enormous measure of work, expertize in the plant illnesses, and furthermore require the exorbitant preparing time to dissect. Henceforth, picture preparing is a procedure that is utilized for the discovery of plant sicknesses. Illness recognition measure includes the means like picture procurement, picture pre-handling, picture division, highlight extraction and order. This paper examined about the strategies utilized for the discovery of plant illnesses utilizing their leaves pictures. This paper likewise depicted about some division and highlight extraction calculation utilized in the plant infection identification.

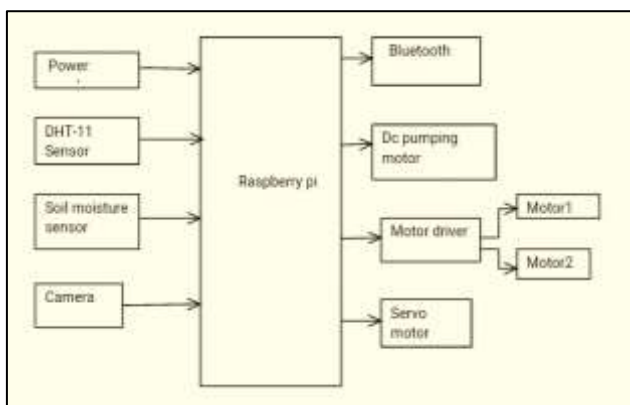
Vijai singh, Varsha, A.K.Mishra, Detection of unhealthy region of plant leaves using image processing and

genetic algorithm, 205, ICA CEA, India. The economy of a nation relies upon the profitability from agribusiness. The distinguishing proof of a plant infection is the fundamental key for forestalling the misfortunes in the efficiency and furthermore for improving the nature of a rural item i.e., food. Conventional techniques are dependable however it requires a human asset for outwardly noticing the plant leaf designs and analyze the illness dependent on their insight. Conventional technique burns-through additional time, dull work for works. In enormous ranch lands, beginning phase identification of plant illness by utilizing computerized procedures will diminish the misfortune in efficiency and furthermore improvement in the result. In this paper, we propose a dream based programmed recognition of plant illness location utilizing Image Processing calculation. The picture preparing calculation is created to recognize the plant contamination or illness by distinguishing the shading highlight of the leaf region. K mean calculation is utilized for shading division and GLCM is utilized for sicknesses order. Vision based plant disease indicated productive outcome and promising execution.

III. PROPOSED METHODOLOGY

Many researches have been done in this field to automate the process. In the present project an effort is made for the design and development of the robot that can perform seeding and watering process without any human intervention. The robot developed is capable of making a placing the seed accurately. The process is controlled by a Raspberry pi. The robot developed overcomes the drawbacks in the traditional method of seeding which includes wastage of seeds, high labor wage, lower utilization of land etc. By the application of automation and robotics in the field of agriculture it is possible to increase the overall efficiency of the agricultural process and can mitigate effects of labor shortage. we are design and development of an agribot for automatic seeding, watering and monitoring. First thing is the drilling process second one is the seed feeding process along with the mud closing and watering the seed. The controlling of the robot can be made via mobile by using Bluetooth and Internet. the raspberry Pi with camera works the picture captures and send to the MATLAB to find the disease in the field. The information will send to mail.

IV. BLOCK DIAGRAM

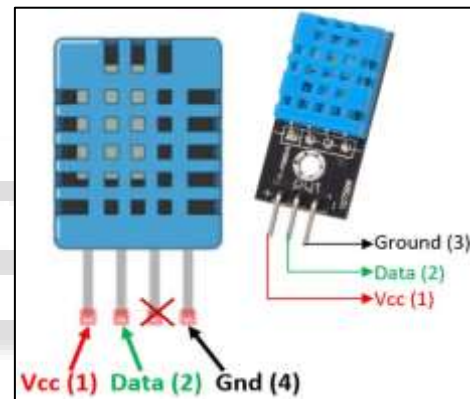


A. Raspberry PI



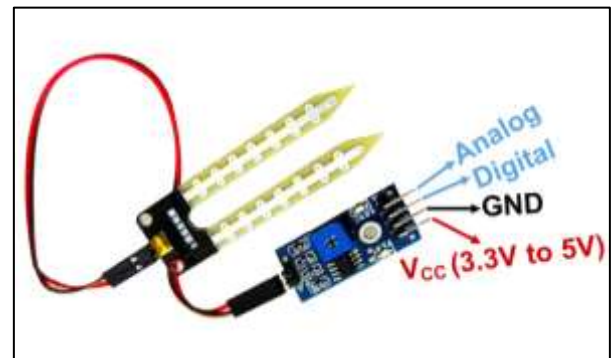
The Raspberry pi is a solitary PC board with charge card size that can be utilized for some undertakings that your PC does, similar to games, word handling, bookkeeping pages and furthermore to play HD video. It was set up by the Raspberry pi establishment from the UK. Essentially we can say Raspberry Pi is a charge card measured PC which likewise fills in as microcontroller. It is quick when contrasted with different regulators.

B. DHT11–Temperature and Humidity Sensor



The DHT11 is a normally used Temperature and clamminess sensor. The sensor goes with a committed NTC to measure temperature and a 8-cycle microcontroller to yield the assessments of temperature and dampness as consecutive data. The sensor is moreover preparing plant changed and consequently easy to interface with various microcontrollers.

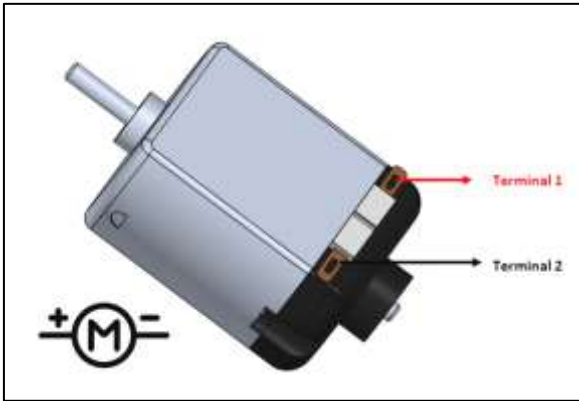
C. Soil Moisture Sensor



This soil moisture sensor module is used to detect the moisture level present in the soil. It measures the volumetric content of water present inside the soil or the field and gives us the moisture level as output. The module has both digital

and analog outputs and a potentiometer to adjust the threshold level in which we mostly use is the digital output.

D. DC Motor



A considerable lot of us might have gone over this DC engines through children toys, for example, far off controlled vehicles, trains and so forth, consequently this engine is likewise called as engine. All things considered this engine can likewise be utilized for some other normal purposes and is generally utilized by fledgling level gadgets specialist. They are extremely rough and simple to utilize and control with normally accessible and wide scope of voltage levels. These engines can turn one or the other way and speed control is likewise conceivable, anyway don't anticipate a quick speed and high force from these little folks.

V. CONCLUSIONS

This adventure presents far off development in the field of cultivation. Exploits features of Android stage to help Farmers Significantly. Provides a versatile UI to farmer to control the machine sufficiently.

It diminishes actual work need which is a safe house to the farmers as finding laborers is an amazingly inconvenient occupation today. He Agribot can work in quite a climatic condition excessively as can work tenacious unlike individuals. The time expected to finish the five functionalities diminishes widely in relationship with doing comparable activities actually. It is a onetime endeavor which reduces the general developing expense essentially. This Agribot goes probably as a section to automated astute developing.

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