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CROP ESSENTIALS MONITORING SYSTEM BASED ON IOT

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ABSTRACT

Agriculture has always been a paramount part of India. It not only gives food and employment to half the nation's population but provides a significant part of our GDP. Smart Agriculture is implemented by using modern day technology to increase the quantity and quality and reducing human labor. Farmers often face huge hurdles in the form of insects, climate, water scarcity, lack of nourishment in soil, its pH and diseases which decrease the crop yield and often kills the crop. Here we propose an idea to overcome a problem that is identifying the type of disease and to detect the environmental contents of the soil like moisture, pH, etc. using image processing along with suitable sensors for detection.

KEYWORD:
Image processing, soil moisture, humidity, soil content, crop diseases, senors

I. INTRODUCTION

Agriculture is the process and science of growing crops, raising and lucrative use of livestock and their products, cultivation and maintenance of soil. Farmers find apt conditions to grow crops and it provides the food and essential items of the nation. It is the bread and butter of most people in India. India is the 2nd largest country and agriculture provides for a large part of the overall GDP of the country. Smart agriculture is the suitable and effectively use the modern technology to increase the quality and quantity of the yield in agriculture and at the same time reduce the labor that is given as input. Sensors are indispensable in the field of smart agriculture. It is being adopted everywhere you reduce the strain on both mankind and environment alike.

Image processing is a method where analog or digital images are processed, edited and operated on. Here the input is the image and output is based on the characteristics or features of that particular image. Image processing is used in collecting information about satellites, earthquakes, publications and in the medical field. In this project we use ARDUINO UNO for interfacing the software and hardware and execute the process. In sensors we use soil moisture sensor, rain sensor, ultrasonic sensor, and DHT11 sensor. This system identifies a disease if we give the image of the affected plant by analyzing the data fed and also helps to detect the moisture, acidic level of soil.

In this paper, section II contains problem statement and preliminaries. Section III contain program analysis and implementing problem. Section IV contain advantage. Section V contain results and Section VI contains conclusion.

II. PROBLEM STATEMENT AND PRELIMINARIES

There have been multiple technologies and ideas that have been proposed by using smart agriculture to make the lives of farmers more easier and increase the yield. But still they face many problems in crop cultivation and harvesting. They experience many impediments in the

form of mainly insects, diseases and lately water scarcity, water acidity, lack of proper irrigation has added to their problems. Dearth of adequate nourishment in soil reduces the yield considerably and this also affects them.

Although many ideas are proposed, farmers are pushed to suicide because they have debts racked up because of buying HYV seeds and pricey fertilizers and still largely believe in nature and heavy rains destroy the crops. So, to overcome one of the main drawbacks, we propose a method to identify the disease or deficiency in crops and also gives the moisture and acidic content of soil or a periodic analysis of soil in pictorial form. The detection of disease of crop is done using Image processing. Here the data of the crop and the disease is fed into the system and when a particular disease attacks the crop, the image of the disease affected crop is compared with data and matches with accurate data and gives the result with remedies. in the system. A regular report of the plant and soil is sent as a pictograph so that farmers can identify the pattern of growth of their crops and soil pattern. In this way, we try to solve one of the most persistent problems that farmers face.

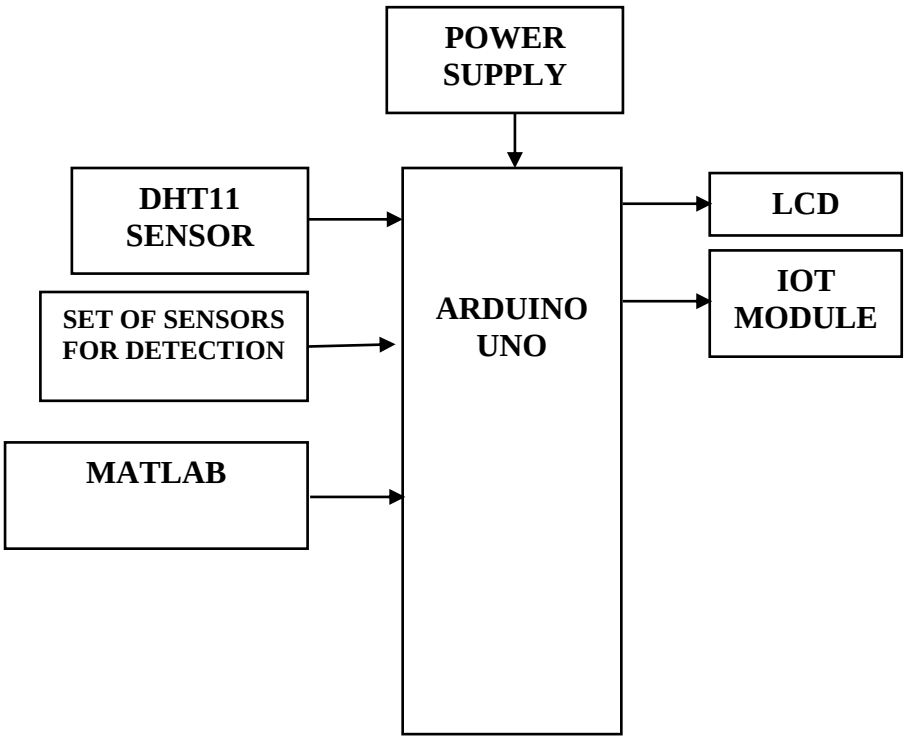

FIG1. BLOCK DIAGRAM OF THE MONITORING SYSTEM

III. PROGRAM ANALYSIS FOR IMPLEMENTATION PROGRAM

Using ARDUINO IDE software with MATLAB and embedded C to write program. The program will have the commands to analysis the image by converting it in shades of grey and compare with data to find the match which is the output. And to operate sensors and determine their values and form a periodic report about the soil. It has an ARDUINO UNO board, DHT11 sensor, ultrasonic sensor, LCD, relay, moisture sensor, etc.

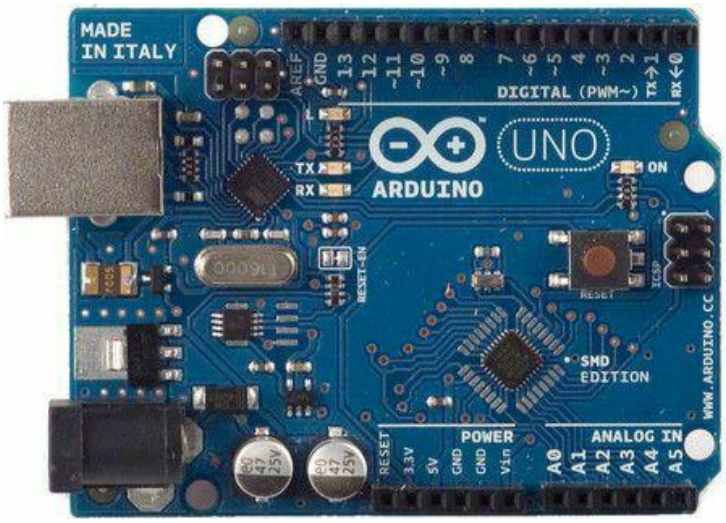

FIG2. ARDUINO UNO BOARD

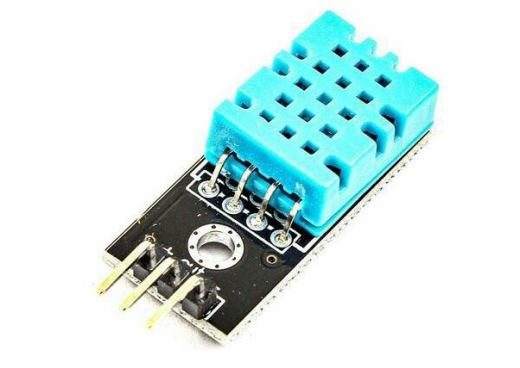

FIG3. DHT11 SENSOR

The DHT11 sensor is used to determine the humidity.

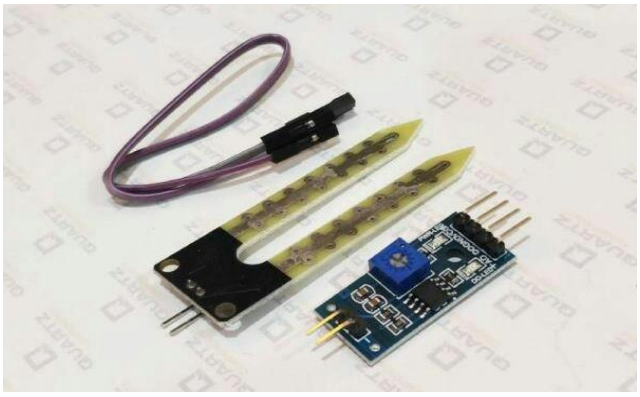

FIG4. MOISTURE DETECTION SENSOR

FIG5. RELAY

IV. ADVANTAGES

The main problem with proposing smart agriculture technologies is that they are mostly exorbitantly high priced which makes them commercially viable only to rich and not middle class farmers. Here we propose a system that can be viable to almost all farmers. Image processing is advantageous because it can be easily and quickly processed, accurate and it is cost effective. The system is efficient because an effective solution is also presented along with the problem which makes it convenient and less time-consuming for the farmers. When regular updates are presented in the form of pictographs, it is easily understood regardless of education status. It needs no high priced sensors to identify and propose a solution and data is presented in a simple and precise manner.

V. CONCLUSION

This project has been proposed to reduce the one of the major handicaps that are faced by farmers in agriculture. This system is designed after referring to the designs and drawbacks of the existing system and the defects in them are overcome. We can detect the disease of crop easily and also know the progress of soil in environmental conditions.

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