IJIREEICE

ISSN (Online) 2321-2004
ISSN (Print) 2321-5526

International Journal of Innovative Research in
Electrical, Electronics, Instrumentation and Control Engineering

Vol. 9, Issue 2, February 2021

DOI 10.17148/IJIREEICE.2021.9201

Crop Essentials Monitoring System Based on IOT

Neenu P.A[1], Ashvitha[2], Aparajitha.C[3], Karpagam.S[4]

Assistant Professor, Dept. of ECE, Agni College of Technology Chennai, Tamilnadu, India[1]

UG Student, Dept. of ECE, Agni College of Technology Chennai, Tamilnadu, India[2, 3, 4]

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.

Keywords: Image processing, soil moisture, humidity, soil content, crop diseases, sensors

I. INTRODUCTION

Agriculture is the process and science of growing crops, making use of livestock and their products, 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 are 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 analysing 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.

OBJECTIVES OF THE STUDY

The objective of the project is to implement smart agriculture in an organic way to protect crops from pests and diseases.

II. REVIEW OF LITERATURE

2.1 Smart farming using IOT

Even today, different developing countries are also using traditional methods and backward techniques in agriculture sector. Little or very less technological advancement is found here that has increased the production efficiency significantly. To increase the productivity, a novel design approach is presented in this paper. Smart farming with the help of Internet of Things (IOT) has been designed. A remote-controlled vehicle operates on both automatic and manual modes, for various agriculture operations like spraying, cutting, weeding etc. The controller keeps monitoring the temperature, humidity, soil condition and accordingly supplies water to the field.[8]

IJIREEICE

ISSN (Online) 2321-2004
ISSN (Print) 2321-5526

International Journal of Innovative Research in
Electrical, Electronics, Instrumentation and Control Engineering

Vol. 9, Issue 2, February 2021

DOI 10.17148/IJIREEICE.2021.9201

2.2 Design and development of soil moisture sensor and response monitoring system

The efficient irrigation management practices based on the monitoring of the moisture in the soil provide a great benefit for the appropriate amount of water applied in the fields. This paper presents design and development of a soil moisture sensor and a response monitoring system. The probes used in this sensor are made of nickel which is an anti-corrosive and robust material for use in agricultural related applications. The response monitoring system 4 measure the moisture of the soil, compare it with the desired values given by the user and generate alert if soil moisture goes below desired value. It helps in problems related to growing of crops in which irrigation is required at irregular interval. It is also helpful in monitoring of soil moisture in golf fields.[1]

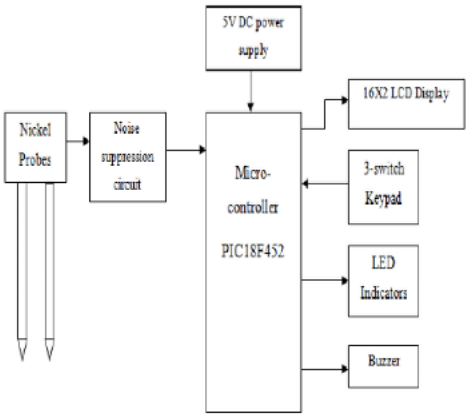

Fig 2.2.1 Block diagram of soil moisture sensor-based response monitor [1]

III. PROBLEM STATEMENT AND PRELIMINERIES:

There have been multiple technologies and ideas that have been proposed by using smart agriculture to make the lives of farmers 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.

IJIREEICE
ISSN (Online) 2321-2004
ISSN (Print) 2321-5526
International Journal of Innovative Research in
Electrical, Electronics, Instrumentation and Control Engineering
Vol. 9, Issue 2, February 2021
DOI 10.17148/IJIREEICE.2021.9201

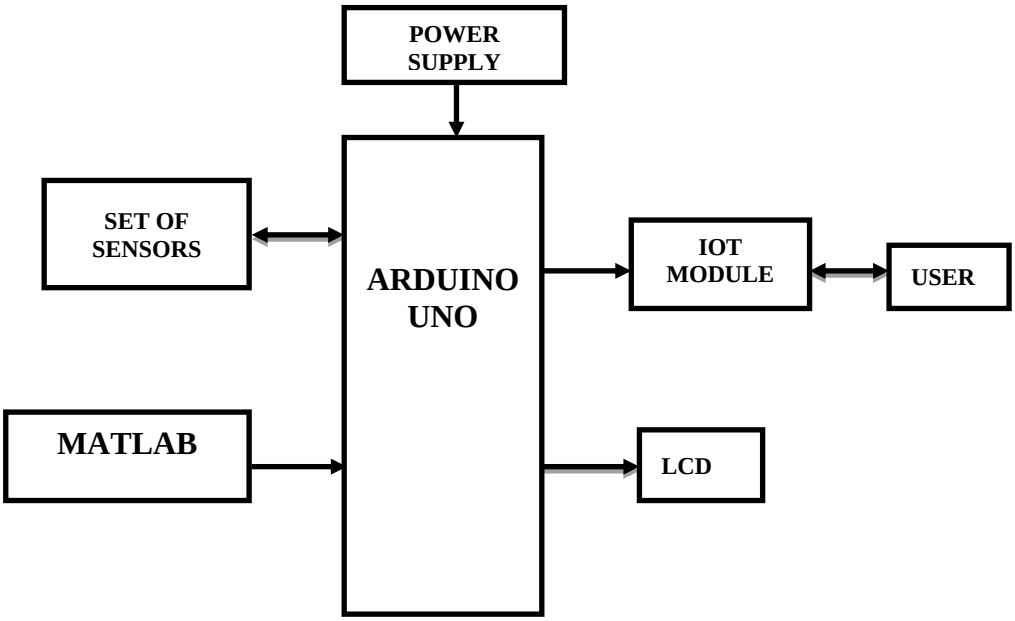

FIG 3.1 BLOCK DIAGRAM OF THE PROPOSED SYSTEM

IV. PROGRAM ANALYSIS FOR IMPLEMENTATION PROGRAM:

Here ARDUINO UNO is the brain of the system and here it is being used with software like ARDUINO IDE, embedded C and MATLAB program to implement the process to identify the disease of the crop and to give the environmental status with image processing technique and sensors related to it.

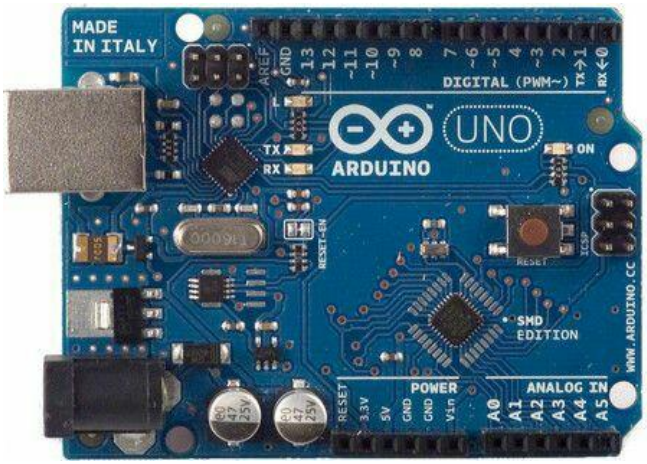

FIG 3.2 ARDUINO UNO BOARD

IJIREEICE
ISSN (Online) 2321-2004
ISSN (Print) 2321-5526
International Journal of Innovative Research in
Electrical, Electronics, Instrumentation and Control Engineering
Vol. 9, Issue 2, February 2021
DOI 10.17148/IJIREEICE.2021.9201

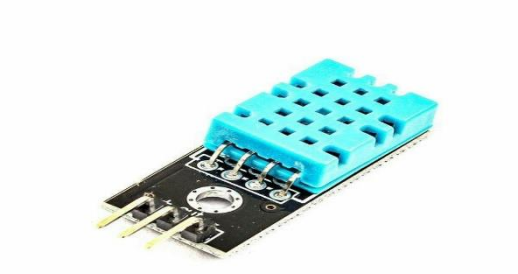

FIG 3.3 DHT11 SENSOR

The DHT11 sensor is used to determine the humidity.

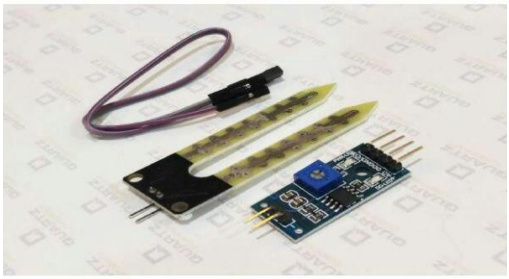

FIG 3.4 SENSORS

These sensors are used to detect the humidity of the atmosphere and the moisture content of the soil and other sensors like pH sensor and ultrasonic sensor, rain sensor is used which helps to find the pH of the soil, detects rain in the atmosphere.

V.RESULT OF THE STUDY

The result of this study is that it identifies the disease of the crop and gives a solution and also the environmental status with the help of sensors, Arduino and MATLAB program.

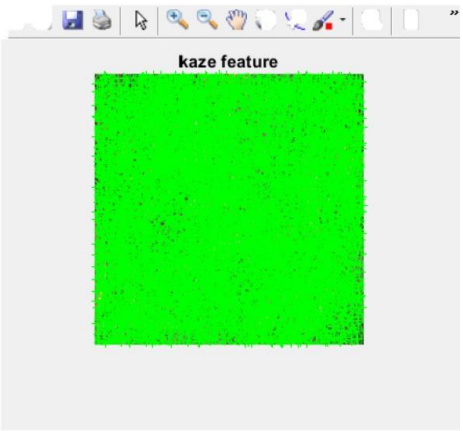

FIG 5.1 KAZE FEATURE

VI. ADVANTAGES

The main advantage of this proposed system is that it is efficient and simple method to follow unlike the other solutions. This process identifies the disease that affects the paddy and gives solution which makes the process easy for user.

IJIREEICE

ISSN (Online) 2321-2004
ISSN (Print) 2321-5526

International Journal of Innovative Research in
Electrical, Electronics, Instrumentation and Control Engineering

Vol. 9, Issue 2, February 2021

DOI 10.17148/IJIREEICE.2021.9201

VII. 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.

REFERENCES

[1] Neha Khanna, Gurmohan Singh, D.K. Jain, Manjit Kaur, "DESIGN AND DEVELOPMENT OF SOIL MOISTURE SENSOR AND RESPONSE MONITORING SYSTEM" in International Journal of Latest Research in Science and Technology, Vol. 3, Issue 6: pp142-145, December 2014

[2] EUDINEI O. SILVA, WAGNER E. VANÇO, AND GERALDO C. GUIMARÃES, "A Technical and Economic Project Analysis of Asynchronous Technology in Distributed Generation Using Methane Gas from Pig Farms" in IEEE conf., 2 march 2020.

[3] Joaquín Gutiérrez, Juan Francisco Villa-Medina, Aracely López-Guzmán, and Miguel Angel Porta Gandara, "smartphone irrigation sensor" in IEEE sensors journal, June 2015

[4] 1Neha Khanna, 2Gurmohan Singh, 3D. K. Jain, 4Manjit Kaur, "DESIGN AND DEVELOPMENT OF SOIL MOISTURE SENSOR AND RESPONSE MONITORING SYSTEM", International Journal of Latest Research in Science and Technology ISSN (Online):2278-5299 Volume 3, Issue 6: Page No.142-145, November-December 2014

[5] Paper-based smart microfluidics for education and low-cost diagnostics Smith Suzanne, Moodley Klariska, Govender Ureshnie, Chen Hao, Fourie Louis, Ngwenya Sibusiso, Kumar Shavon, Mjwana Phumlani, Cele Hastings, MbanjwaMesuliB, Potgieter Suretha, Joubert Trudi-Heleen, Land Kevin, and. South African Journal of Science.2015-November.

[6] Employee Demography, Organizational Commitment, and Turnover Intentions in China: Do Cultural Differences Matter? Chen Zhen Xiong, Francesco Anne Marie. Human Relations.2000- Jun;869-887.

[7] Armstrong text quote singles Handbook of Human Resource Management Practice (11th ed.)20092Michael Armstrong. Armstrong text quote singles Handbook of Human Resource Management Practice (11th ed.). London: Kogan Page 2009. 1088 pp., ISBN: 978-0-7494-5242-1 UK £39.50 (paperback) Willens Catherine. Industrial and Commercial Training.2009-sep;344-346.

[8] Amandeep, Arshia Bhattacharjee, Paboni Das, Debjit Basu, "Smart farming using IOT",2017, IEEE.