IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 7.918 ⁜ Vol. 11, Issue 10, October 2022

DOI: 10.17148/IJARCCE.2022.111005

IMPLEMENTATION OF ROVER WITH FIELD PROTECTION AND CROP HEALTH MONITORING SYSTEM AND FLOOR SWEEPING SYSTEM

D Pavankumar[1], Roopa S[2], Pradeep Kumar V H[3], HJ Jambukesh[4]

Asso Professor, Dept of Electronics Communication SJM Institute of Technology, Chitradurga, India[1]

Asst Professor, Dept of Electronics Communication SJM Institute of Technology, Chitradurga, India[2]

Asst Professor, Dept of Electronics Communication SJM Institute of Technology, Chitradurga, India[3]

Asst Professor, Dept of Electronics Communication,Govt Engineering College Haveri,India[4]

Abstract: The world today is governed by automation, In sd most of the domain, automation has maneuverer industrial advances and has become predictable. But in a lesser degree, the contribution of automation to agriculture. When complex operations are made automated to simplify tasks, the benefits of automation can also be tapped to perform simple household tasks also. Cultural irrigation is made cost-effective by considering soil, temperature and humidity levels of moisture. Health supervision is performed by an autonomous agricultural rover that moves around the field and collects data through a camera attached to it. Using the Ultraviolet Flame sensor, it is identified in case of fire incidents and the fire is placed off. The farm also uses a PIR sensor and buzzer to protect it from animal intrusion. SWEEPY , the smart floor cleaner is both an autonomous and manual controlled cleaning machine used to simplify and achieve the task of cleaning. By means of its dry and wet modes all round cleanliness and hence good health is achieved.

Index Terms - IOT, Image Processing, Machine Learning, Open CV, Laptop, IP Camera.

I. INTRODUCTION

The latest Internet of Things (IoT) progress in precision farming enables us to enhance general management of agriculture. Because of its extremely interoperable, scalable, pervasive and open nature, IoT is the ideal match for precision agriculture. There are many technologies obtained from IoT, all of which offer numerous advantages including decreasing the risk of vendor lock-in, adopting machinery, and improving sensing / automation systems. Agriculture is a primitive occupation of human subsistence.

Agriculture's protection and growth is therefore essential. There are many issues in the sector of agriculture that still need to be solved as most of the methods used by farmers are outdated and do not satisfy the anticipated output. The plants are watered without understanding their need, which can lead to crop drying or water wasting. Sometimes the plants are watered without understanding the water level in the tanks or well, resulting in water being unavailable in critical circumstances. Although the plants are properly watered, the nutrition provided to the plants may be inadequate, and unknown illnesses may result in the yield falling below the threshold. To overcome this, an ideology for adequate surveillance of plant nutrient deficiencies and illnesses needs to be proposed. for instance, they focused on rice crops that focused on two significant nutrients, namely magnesium and nitrogen Using machine learning.

II. OBJECTIVES

The basic aim of the project is to build up a multipurpose machine which is utilized for monitoring the agriculture field by making use of camera, water sprayer and sweeping of floor with least changes in accomplices with minimum cost. The moisture sensor senses the moisture content of the soil and if required sprays the water. The whole system of the robot works with the battery. Farmer can easily operate the robot through remote by sitting at one end thus reducing the man power and utilizing the technology.

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 7.918 ⁜ Vol. 11, Issue 10, October 2022

DOI: 10.17148/IJARCCE.2022.111005

III.METHODOLOGY

In order to provide an effective solution to the issues encountered during farming, a model for enhanced irrigation, an independent rover for field surveillance, a system for identifying and classifying impacted crops and a protection method were incorporated.In order to promote efficient plant irrigation and prevent water wastage, a module for soil moisture detection, a DTH11 module and a module for water level sensors have been merged and their values are used to determine whether or not the crop can be watered. The soil moisture is taken into consideration at first. If the soil's water level is below the plant's necessary water level, the temperature and humidity will be inspected. In the perspective that watering the plants when it is about to rain is ineffective, temperature and humidity are verified. When all things are insufficient for the plant and when the plant does not fulfils the preconditioned value sufficient for the plant, and the water level in the tank or well should be checked when the plant has to be irrigated. This is achieved in the event of inevitable plight, given the requirement of water. It is stated to the farmer if the water level is small and they can take the appropriate action.

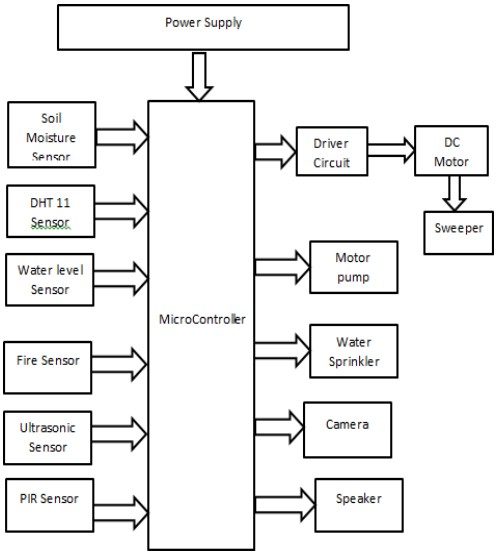

Fig1: Proposed Block Diagram

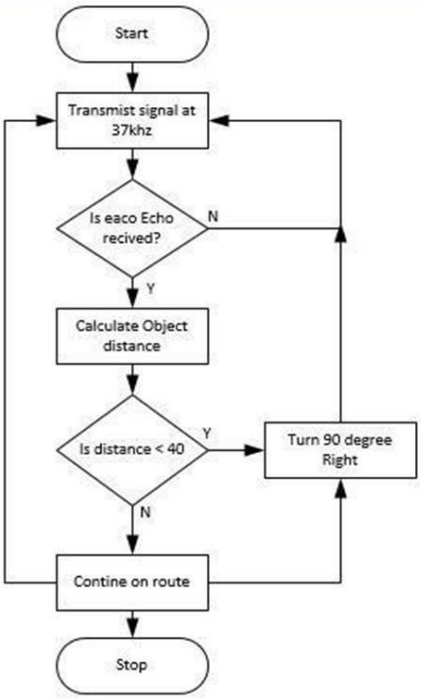

Fig2: Flowchart Autonomous Rover Working

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 7.918 ⁜ Vol. 11, Issue 10, October 2022

DOI: 10.17148/IJARCCE.2022.111005

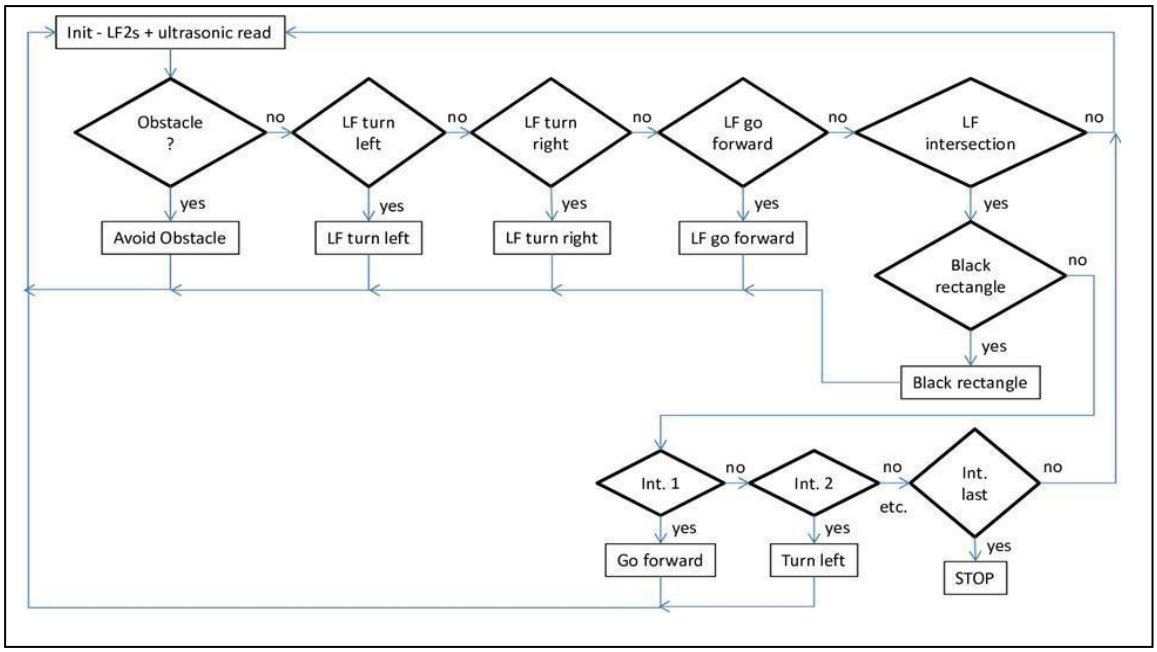

Fig3: Implementation of Autonomous Rover Working

IV.HARDWARE DESCRIPTION

4.1Microcontroller ESP32

ESP32 Board in Arduino IDE
There's an add-on for the Arduino IDE allows you to program the ESP32 using the Arduino IDE and its programming language.

4.2ESP32 Pinout Guide

The ESP32 has more GPIOs with more functionalities compared to the ESP8266.
With the ESP32 you can decide which pins are UART, I2C, or SPI – you just need to set that on the code. This is possible due to the ESP32 chip's multiplexing feature that allows to assign multiple functions to the same pin. If you don't set them on the code, the pins will be used as default as shown in the figure below (the pin location can change depending on the manufacturer).

4.3Soil Moisture Sensor

This sensor can be used to test the moisture of soil, when the soil is having water shortage, the module output is at high level, else the output is at low level. By using this sensor one can automatically water the flower plant, or any other plants requiring automatic watering technique. Module triple output mode, digital output is simple, analog output more accurate, serial output with exact readings.

4.4Flame Sensor

Flame sensor is the most sensitive to ordinary light that is why its reaction is generally used as flame alarm purposes. This module can detect flame or wavelength in 760 nm to 1100 nm range of light source. Small plate output interface can and singlechip can be directly connected to the microcomputer IO port. The sensor and flame should keep a certain distance to avoid high temperature damage to the sensor. The shortest test distance is 80 cm, if the flame is bigger, test it with farther distance. The detection angle is 60 degrees so the flame spectrum is especially sensitive. The detection angle is 60 degrees so the flame spectrum is especially sensitive.

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 7.918 ⁜ Vol. 11, Issue 10, October 2022

DOI: 10.17148/IJARCCE.2022.111005

4.5 IP Camera

The camera body is made of plastic. The protective lens rim outer diameter is 20.6 mm. The lens protrudes forward making protection against scratches and dents. The camera uses the most popular LCD driver. It works with 2-inch LCD display with mediocre viewing angles.
Brightness is enough for shooting under different lighting conditions. The screen is 8touch sensitive and is covered with glossy transparent protective film. The front panel has the power button. The shutter button is located on the top.

4.6 SOFTWARE DESCRIPTION

- Arduino IDE
- C++
- Image Processing
- Machine Learning(Open CV)

V.RESULTS AND DISCUSSION

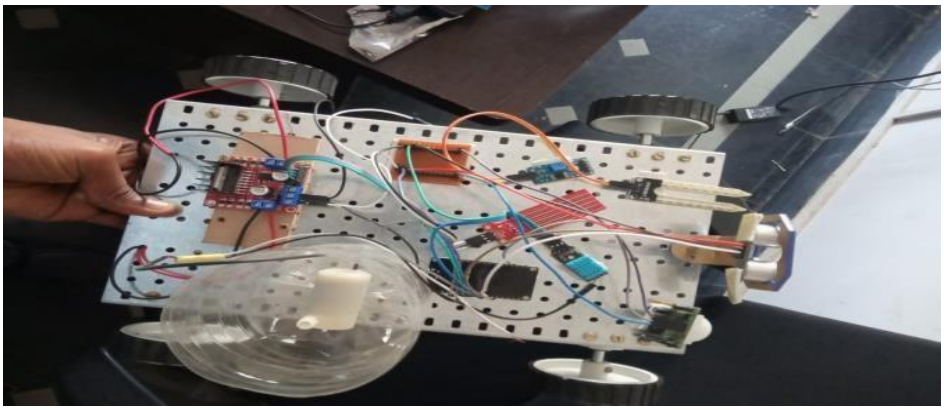

Fig4: Snapshot of Agriculture Rover

The basic aim of the project is to build up a multipurpose machine which is utilized for digging the soil, seed sowing, water sprayer and close the mud with least changes in accomplices with minimum cost. The moisture sensor senses the moisture content of the soil and if required sprays the water. The whole system of the robot works with the battery and the solar power. Farmer can easily operate the robot through remote by sitting at one end thus reducing the man power and using technology.

VI. CONCLUSION

The outcomes of this system will carry farming to the next level development. The architecture would reduce the manual labour and mistakes, and thereby improving crop productivity. Through using the irrigation system as stated in the document, crops obtain the optimal water level, and it is possible avoid water wastage. Detection of earlier nutritional deficiencies and diseases helps the farmer reduce yield losses, and protecting the farmland prevents physical damage.

REFERENCES

[1] AmoghJayaraj Rau, JairamSankar, Ashok R Mohan, Deepti Das Krishna, and Jimson Mathew, “IoT Based Smart Irrigation System and Nutrient Detection with Disease Analysis”, IEEE Region 10 Symposium, 2017

[2] Pooja V, Rahul Das, Kanchana V, “Identification of Plant Diseases using Image Processing Techniques”, IEEE International Conference on Technological Innovations in ICT For Agriculture and Rural Development, 2017.

[3] Sathiesh Kumar V, Gogul I, Deepan Raj M, vc rgftPragadeshS.K,SarathkumarSebastin J, “Smart Autonomous Gardening Rover with Plant Recognition using Neural Networks”, 6th International Conference On Advances In Computing & Communications, ICACC 2016, September 2016.