Available at www.ijsred.com

RESEARCH ARTICLE OPEN ACCESS

Automatic Inspection in Agriculture Using IOT

Dr.D.R.P. Rajarathnam[1*],Ms.C. Sumithra[2*], Kanmani R[3], Praveen Rajan S[4], Gokulapriyan.S[5]

[1*]*Head of the Department,Department of Mechatronics Engineering,*
[2*]*Associate professor, Department of Mechatronics Engineering*
[3,4,5]*Students,Department of Mechatronics Engineering,*
Paavai Engineering College, Namakkal– 637018, Tamil Nadu, India.
Tel: +91-8667394438
E-mail:praveenrajan15403522@gmail.com

Abstract - This inspection strives to develop a robot capable of performing operations like automatic monitoring, inspecting water content according to seed varieties by use of IoT.It checks the level of humidity and inform the farmer. The operating system will be facile even for uneducated peoples.

Keywords:- Farming, IoT, sowing, harvest, humidity, conventional, ground water, operating system, wireless network.

I. INTRODUCTION:

The engineering research in field of agriculture holds a key for sustainable future of mankind. Technological advancement in farming, referred to as agricultural technology as grabbed a massive attention among researchers investors and users.

It focuses on every aspect of farming, starting from crop selection, land preparation, seed selection, sowing until the crop is harvested. Agricultural technology is automation of conventional farming techniques using modern day robots and drones. Development of agricultural equipment has been an extensive process over past many decades and it still continues with intense on robots in agricultural field.In our inspection strives to develop a robot capable of performing operations like automatic monitoring, inspecting water content according to seed varieties by use IoT. It checks the level of humidity and inform the farmer. The operating system will be facile even for uneducated people. The agricultural robots can also connected to the wireless network will collect the huge amount of information.

II. LITERATURE SURVEY:

Balaji Banu [1] designed a wireless sensor networks to observe the conditions of the farming and increasing the crop yield and quality. Sensors are used to monitor different conditions of environment like water level, humidity, temperature etc., The processors ATMEGA8535 and IC- S8817 BS, analog to digital conversion and wireless sensor nodes with wireless transceiver module are used in this designing system. Database and web applications are used to retrieve and store data. In this experiment the sensor node failure and energy efficiencies are managed.

Joseph Haule [2], carried out experiment on intelligent agriculture greenhouse monitoring system based on Arduino technology. The system performs data acquisition, processing, transmission and reception functions. The aim of their experiments is to realize greenhouse environment system, where the of system efficiency to manage the environment area and reduce the money and farming cost and also save energy.

Patrick M. Grace [3], have proposed an experiment that explains the use of WSN used in automating irrigation. Irrigation control and rescheduling based on WSN are powerful solutions for optimum water management through automatic communication to know the soil moisture conditions of irrigation design. The process used here is to determine the proper frequency and time of watering are important to ensure the efficient use of water,

high quality of crop detection delay throughput and load.

M.S.Rahman, M.A.Monayem Miah, Moniruzzaman and S. Hossain [4] have studied the influence of farm automation on man power requirements for growing wheat crop in Northern Bangladesh. This study revealed that the yield of wheat crop under automation is increased to 2.65 t/ha from 2.57 t/ha using conventional farming practices. Traditional forms have higher variable cost (Tk.10,102) and whereas the mechanized farms have higher gross margin (Tk. 14,168) compared to traditional farm. This paper is used to identify the quality of the crop. The results indicated that farm mechanization will significantly reduce the man power requirements.

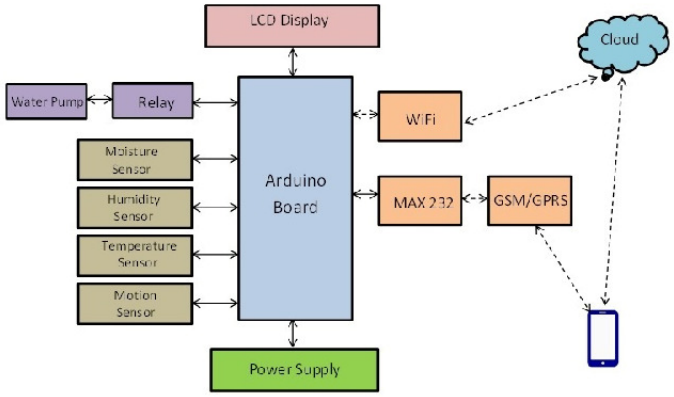
James F. Thompson and Steven C Blank [5] stated that mechanization of agriculture helps to remain competitive. Automation of agriculture has helped farmer to enhance their crop production and decrease the cost in California and they are ahead of the competition in the global marketplace. The authors have conducted a study of rice and tomatoes cultivation and discovered that manpower requirement has been decreased by 92% to 97% and total input costs decreased by 20%.

S.S.Katariya, S.S.Gundal, Kanawade M.T and Khan Mazhar [6] have designed a prototype robot for automation of agriculture activities such as water supplying, dropping of seeds accurately and automatically ploughing, pesticide spraying. The echo-friendly solar power system installed in the field supplies power to robot. Tracking system guides the movement of the robot in a pre-defined path only for crops. The pesticide spraying mechanism avoids direct contact between farmer's body and poisonous pesticides. This system also maintains a standard level of pesticide quantity which improves the crop quality and soil quality standards. The water supply system provides accurate water to a particular crop and saves the wastage of water

Drishti Kanjilal, Divyata Singh, Rakhi Reddy and Prof Jimmy Mathew [7] stated that the world is getting automated with advancement of technology. Manual labour is substituted by automated systems because of advantages like energy efficiency, safety and speed of operations and promotes agriculture growth. Agriculture is the primary economic sector of India and other developing countries. The concept of automation is extended to the agricultural farms and farm houses. Many activities of the farm like auto-irrigation cycles, secure temperature controlled enclosures for livestock and farm products are automated. This paperdiscuss about the implementation of automatic lighting system, auto-sprinkler system, in-house temperature control and security for the farm houses.

Shiva Prasad B.S, Ravishankar M.N and B.N Shoba [8] have designed a prototype agriculture robot for seeding and fertilizing robot using microcontroller. The robot also senses the soil PH, humidity, temperature and moisture. The remote controls the robot. The remote controller is used to move the robot to the destination and perform the above functions. The robot is internet enabled. DC motors are used to navigate the robot to required position and its speed is controlled by the remote.

III. BLOCK DIAGRAM



A.Arduino

It is the very valuable addition in the electronics that consists of USB interface, 14 digital I/O pins, 6 analog pins and Atmega328 microcontroller. It also supports serial communication using Tx and Rx pins.

It is an open source platform, means the boards and software are readily available and anyone can modify and optimize the boards for better functionality.

B. Sensors

It is the element that produce signals relating to the quantity that being measured. The device detects changes and events in a physical stimulus and

provides a corresponding output signal can be measured or recorded.

1. Temperature sensor
2. Humidity sensor
3. Soil moisture sensor

1. Temperature sensor

This provides for temperature measurement through an electrical signal. These sensors are the key to read temperatures correctly and to control the temperature in industrial applications.

2. Humidity sensor

Humidity measurement and determines the water vapour present in a gas such as air or a pure gas, such as nitrogen or argon. Most commonly used units for humidity measurements are Relative humidity (RH) – function of temperature, dew/frost point (D/F) – function of pressure and Parts per Million (PPE) – absolute measurement.

3. Soil moisture sensor

This sensor uses capacitance to measure dielectric permittivity surrounding medium. In soil, dielectric permittivity is a function of water content. This sensor creates voltage proportional to the dielectric permittivity and therefore the water content of soil. The sensor averages the water over the entire length of the sensor.

C. Motor driver

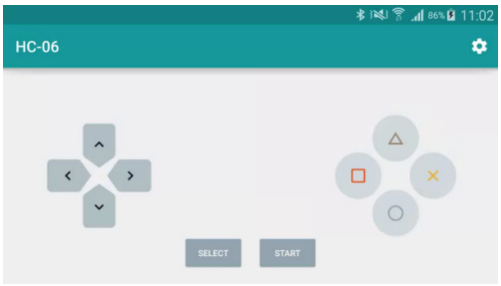
Motor drives are circuits used to run a motor. They are commonly used for motor interfacing. These circuits can be easily interfaced with the motor and the selection depends upon the types of motor being used and their ratings (current, voltage).

D. RFID Tag and Reader

These tags are small chips that are used in our day to day life unlocking doors, entering into cars etc. These tiny chips along with RFID reader forms the RFID system. The data is retrieved by the reader using electromagnetic waves. Tags can store only a few kilobytes of data.

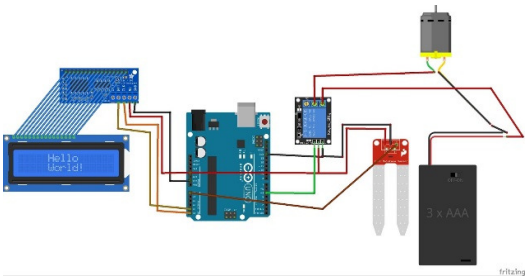
E. User Interface

This application is developed in the android application studio. This app can be installed in the android smart phone to control the RC unit. This app includes buttons for the movement of the vehicle in different directions. These commands are as follows: Forward, backward, left, right, start and stop.



IV. CIRCUIT DIAGRAM

This circuit diagram I the connection between the Arduino, senosrs and motors. This also shows the motor driver which is responsible for the movement of the motors in all directions. Supply of 5V is provided to each motor of the vehicle.



V. ACKNOWLEDGEMENT

We express our sincere thanks to our honourable principal **Mr. Premkumar**, who gives us an opportunity to work on this project. Being the students of Paavai engineering college, it was our pleasure to work on this project and it made us to learn lot of new things.

I would like to thank our project guide, **Prof. Ms. C. Sumithra**, who with our friendly nature helps us to complete our project and guided us continuously. We are very grateful to thank our head

of the department, **Mr. Dr. D.R.P. Rajarathinam**, who coordinated with us and gave us his valuable time.

VI. CONCLUSION

Internet of Things has enables the automatic inspection in agricultural field easy and efficient to enhance the productivity of the crop and hence profits for the farmer. Wireless sensor network and sensors of different types are used to collect the information of crop conditions and environmental changes and these information is transmitted through network to the farmer/devices that initiates corrective actions. Farmers are connected and aware of the conditions of the agricultural field at anytime and anywhere in the world. Some disadvantages in communication must be overcome by advancing the technology to consume less energy and also by making user interfaceeaseofuse.

VII. RESULT

This project will be very useful and helpful to the farmers in the future generation. This project is a user friendly that unskilled persons are also can able to operate easily. Hence by using this project the each and every need of agricultural work can be satisfied easily.

VIII. REFERENCES

1.Balaji Banu, "Agriculture Field Monitoring and Analysis using Wireless Sensor Networks for improving Crop Production", 2014 Eleventh International Conference on Wireless and Optical Communications Networks (WOCN)

2. Joseph Haule, "Intelligent agent greenhouse environment monitoring system based on IOT technology", 2015 International Conference on Intelligent Transportation, Big Data & SmartCity

3. Patrick M. Grace, Kisangiri Michael, "Deployment of wireless sensor networks (WSN) in automated irrigation management and scheduling systems: a review", Science, Computing and Telecommunications (PACT),2014,PanAfricanConference

4. M.S.Rahman, M.A.Monayem Miah, Moniruzzaman and S. Hossain,"Preliminary Design for Crop Monitoring Involving Water and Fertilizer Conservation Using Wireless Sensor Networks", Communication Software and Networks (ICCSN), 2011IEEE3rdInternationalConference.

5. James F. Thompson and Steven C Blank, "Wireless Sensor Network Based Automated Irrigation and Crop Field Monitoring System", 2014 Sixth International ConferenceonAdvancedComputing(IcoAC).

6.S.S.Katariya, S.S.Gundal, Kanawade M.T and Khan Mazhar, "A Global Crop Growth MonitoringSystem Based on RemoteSensing",2006 IEEE International SymposiumonGeoscienceandRemoteSensing.

7. Drishti Kanjilal, Divyata Singh, Rakhi Reddy and Prof Jimmy Mathew,"Wireless Sensor Networks for Habitat Monitoring", InternationalConference.

8. Shiva Prasad B.S, Ravishankar M.N and B.N Shoba, "An Analysis of Various Routing Protocols for Precision Agriculture using Wireless Sensor Network", 2015, IEEE International Conference on Technological Innovations in ICTforAgricultureandRuralDevelopment(TIAR2015) .

