

Agriculture Fertilizer Distribution using Android Bluetooth Module

^{#1}Shilpa Hinge, ^{#2}Akshay Patil, ^{#3}Rushikesh Mandrupkar



¹shilpahinge12796@gmail.com,

²akshay.patil5596@gmail.com,

³rushi.mandrupkar@gmail.com

^{#123}Department of Electronics Engineering,
SPPU, Pune, Maharashtra, India

ABSTRACT

In the case of Indian agriculture, the automation is lacking factor in current scenario. Agriculture accounts for ~15% of Gross Domestic Product (GDP) of INDIA but more than 40% population directly or indirectly depends on it. The average yield from agriculture is quite low compared to other countries making India vulnerable in global market. We have to focus and implement the advances in Information and Communication Technology in agriculture. That will improve the condition of Indian agriculture and will also improve health conditions of farmers, so this paper is about spraying fertilizers on crops using android application. For long distance communication we have used Bluetooth module which transfers command from android module to microcontroller which then drives DC motors for further movement.

Keywords— Agriculture robot, Bluetooth module, Android module, Proximity Sensor

ARTICLE INFO

Article History

Received: 25th December 2020

Received in revised form :

25th December 2020

Accepted: 30th December 2020

Published online :

2nd January 2021

I. INTRODUCTION

The aim of this project is to prevent farm workers from hazardous side effects of fertilizers spraying. Various studies pointed out that the sprayer human operator is specially exposed working inside greenhouse, high temperature and poor ventilation. So the automation in spraying and monitoring has a greater impact on social and economical aspect. In this project we are going to make sure the robot can be operated very easily so that anyone can use it. The robot will move forward in the farm on predefined track. The project consists of infrared proximity sensors, Bluetooth module, sprinklers and IC's mounted on it. We have AT89S52 microcontroller which is having 8K bytes of flash memory and 5V operating range. Also we have used Liquid Crystal Display (LCD) of 16X2 which is alphanumeric and having good visibility in daylight use. DC motors of suited specifications are used at various phases. There are various basis modules in this project such as parameter monitoring, parameters controlling and automatic movement of robot in the farm. In this phases sensors and motors come into action which impacts the total output of this project. A display unit (LCD) we have mounted on this robot will show the values of parameters that need to be selected such as amount of fertilizer to be

sprayed. That will be helpful for human operator of this project to perform further operations. Accurate readings from such system will be helpful in further studies as this is more accurate than manpower. We have used Bluetooth module HC-05 which is easy to use Serial Port Protocol based module. This model has decent range around the robot also this is cost effective component which helped to reduce the cost of project. The most remarkable thing of this project is, it is operated using android module with keeping in mind safety of operator. Also the track can be laid in the farm if the ground is uneven for smooth transit and caterpillar wheels will also be of greater use. Future improvisations or Future scope of this is briefly discussed in following sections.

This project will help farmers and workers health as fertilizers are very much harmful to human beings and this will be the solution on labour shortage and timely unavailability. The working of this robot is very understandable to implement and use. The other aspects are covered in literature survey and methodology section followed by this one.

II. LITERATURE SURVEY

Rooftop is effective in smaller farms but very costly in implementation. Brief idea about full automation of farm

suggesting greater yield and reducing labour cost but initial cost of this is much high.[1]

Remotely operated robot with advanced technology in agriculture but keeping in mind financial aspects of farmer. Bluetooth module can be used in suitable range with keeping low initial cost .There are limitations in range of this project while working in the farm.[2]

This paper gives basics about controlling bot using IOT. It also has applications in seeding and ploughing .IOT has vast domain of applications as it gives precision farming. IOT uses real time clock in its operations making sure the efficacy is very high.[3]

Use of Android module is discussed in this paper as it gives advantages over other. This paper gives example of control of motor and irrigation process with increase in efficiency. Also previous data can be used very effectively.[4]

III. OBJECTIVES

The objectives of this project are to show the current status of Indian agriculture and the potential it has in our economy and impacts. our aim is to make a prototype robot which can be used to overcome following:

A)The main objectives of this project is to prevent the farmer from the repercussion caused due to sprinkling of fertilizer.

B)Giving the farmer the options when the labour is not available for various reasons also reducing manpower required in the farm.

C)To reduce the time consumed by same work

IV. METHODOLOGY

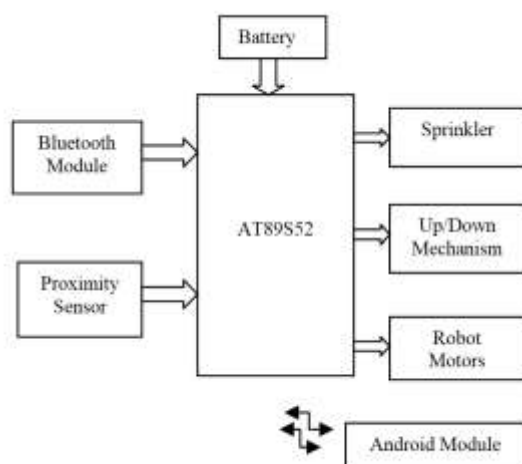


Fig: Block Diagram

The working of system:

A) The robot is placed on track in farm and is controlled by android module with the help of Bluetooth module.

B)Supply is given to the robot of 12V output to the main circuitry.

C)Display on the robot will show the amount to be sprayed and height. Android module helps to choose available options.

D)After this robot starts moving in forward direction and simultaneously starts spraying on adjacent crops in periodic intervals.

V. ADVANTAGES

- Requires less man power
- Efficiency increases
- Overall production increases
- Quality of crop will increase
- Equal and appropriate amount of fertilizer can be given to crop.

Applications of this project are as follows:-

- This system is mainly used in farming at multiple stages.
- This system can also be used in greenhouses.
- In gardening process this is system can be used.

VI. FINAL ASSEMBLY



Fig: (a)



Fig: (b)



Fig: (c)

Fig: (a)-Actual prototype
Fig:(b)&Fig:(c)-LCD Display during operation

VII.CONCLUSION

Thus we have discussed how this project is going to work in real time. The reasons why we thought of this is also very important and we in our way contributed to the cause. All the processes of this project at different stages needs to be managed in proper way to get best results. Bluetooth controlled robots using android module is a versatile system that can be implemented in various aspects of farming for better results. Its range is limited i.e. around 10m, keeping in mind the economic aspects of project. For future enhancements GPS connectivity with video monitoring system can be a advanced version.

VIII. ACKNOWLEDGEMENT

Every work has imprint of so many people and in this case also no different. We would like to thank Mrs.N.S.Warade for her guidance and encouragement throughout this work. Also we would like to thank HOD Dr.D.K.Shedge for cooperation provided to us in many ways. Lastly we are grateful to each and everyone who supported us in this

REFERENCES

- [1]Ron Berenstein and Yael Edan(2017).Automatic Adjustable spraying device for site specific agriculture application(IEEE).
- [2]K. Sujata and B. Londhe(2017).Remotely operated pesticide sprayer robot in agriculture field(ICJA)
- [3]V. Gowrishankar and Dr.K.Venkatachalam(2018).IOT based precision agriculture using Agribit(ICJA)
- [4]Sushil S. Patil and Varsha D. Nikam(2016).Automation in farming using android application(ICRIEM)