

# Agricultural Safety with Autonomous Robot Spraying Pesticide

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**Abstract**—The proposed work presents technical solution to current human hazards involved in spraying of toxic chemical in the confined space of atmosphere. This is achieved by constructing an autonomous robot based on AT89c52 microcontroller. Communication between robot and user is made by human operator via Bluetooth and android app. This is the efficient way which reduces human work. The Robot will be having spray mechanism and chemical tank. According to command received, motion of robot will be controlled.

**Index Terms**-Android Smartphone, Bluetooth Module, Microcontroller, Wireless Camera Unit.

## I. INTRODUCTION

In this project work an engineering solution of the current human health hazards involved in spraying potentially toxic chemicals. Such types of robot are called as agrobots. Here in this project we want to design a robot which can be controlled by using a android mobile phone for spraying the pesticide in the field or greenhouse. So, an agriculture robot which helps the farmers to pesticides liquid and minimize their workload[2].

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Recent century is full of technology, none field can't be remain without use of the technology, Agriculture is one of those fields. More than 42% of the total population in the world has chosen agriculture as their primary occupation. The farmers have do many works, such of them are also not good for their health. In recent years, the development of autonomous vehicles in agriculture has experienced increased interest. This development has led many researches to start developing more rational and adaptable vehicles. In the field of agriculture autonomous vehicle, a concept is being developed investigate if multiple small autonomous vehicle, machines would be more efficient than traditional large tractors and human force.



Fig1: Pesticide Spraying Robot

These vehicles should be capable of working 24 hours a day all year round, in most whether condition. Moreover such a system may have less environmental impact if it can reduce over application of chemical and high usage of energy, such as diesel and fertilizer, by control that is better

matched to stochastic requirements. So, this project is based on spraying the pesticide liquids on crops in the field with the help of robots which can reduce the manually work.

## II. RELATED WORK

In previous paper the autonomous pesticide spraying robot is done with the help of microcontroller and sensor. The various sensors are used like induction sensors, infrared sensors, bump sensors. The induction sensor is directly connected to the microcontroller; allowing the robot to sense that it is indeed on the rails and on course. The bump sensors are located at the front and back of the robot to stop the robot from bumping into any object that may be in the path of travel.[2]

Our project is done with the help of Bluetooth module, android app and also use camera. Using these, farmer can easily control the robot and spraying pesticide on the crops. By viewing on computer/TV/Digital video recorder.

picks up the signal and outputs it to a TV / Computer / Digital Video recorder.

### Bluetooth Module:



Fig3:Bluetooth Module

## III. THEORY

### Wireless Camera:

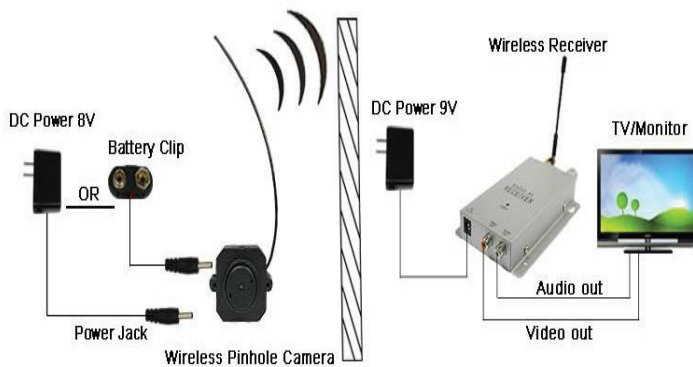


Fig2:Wireless Camera

Wireless cameras are basically described as a wireless transmitter carrying a camera signal. The Camera capture the images, the camera then provides the video to the transmitter, then the transmitter sends the wireless signal to the receiver. There are many types of wireless cameras. Any camera can be made wireless transmitter and receiver. The camera and transmitter require power. The power is provided by battery and/ or transformer / adapter. Figure 2 shows wiring for the wireless camera and transmitter end follows.

The camera sees an image, and sends it to the transmitter, and the transmitter sends the signal out to the air. The receiver

Bluetooth is a wireless technology standard for exchanging data over short distance (using short length radio waves) from fixed and mobile devices, creating personal area networks (PANs). It was originally conceived as a wireless alternative to RS-232 data cables. Bluetooth is a promising standard for short range wireless communication. Bluetooth uses the same frequency as wavelength but with much less effect. Bluetooth is a wireless technology for transmission of voice and data over a short distance. RXD and TXD pin of Bluetooth evaluation kit connected with the controller through serial port.

**IV. METHODOLOGY**

Bluetooth module is configured with App and microcontroller is programmed for code received from Bluetooth.

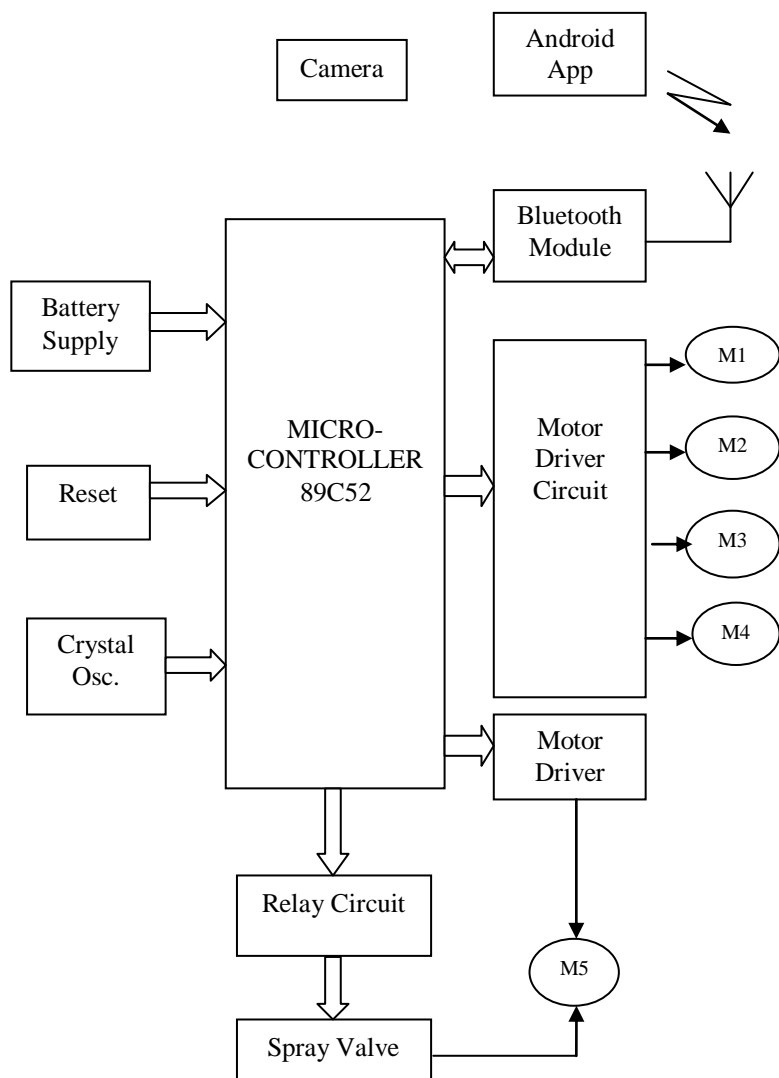


Fig4:Block Diagram

As shown in fig. microcontroller receives signal from Bluetooth via serial communication(TxD and RxD). As per signal from microcontroller to Bluetooth motor will ON by microcontroller via motor driver IC L293D. Motor will move forward, reverse, left, right as per command from Bluetooth to microcontroller. In this project we use the camera when crop is detected by visualiasing camera then we can stop motor and start spray system, is decided by another command received by Bluetooth to microcontroller. According to the commands received from android the robot motion can be controlled. All commands are received by android App from mobile.

**V. SOFTWARE IMPLIMENTATION**

Programming is done using Embedded C language. It is easy to write code.

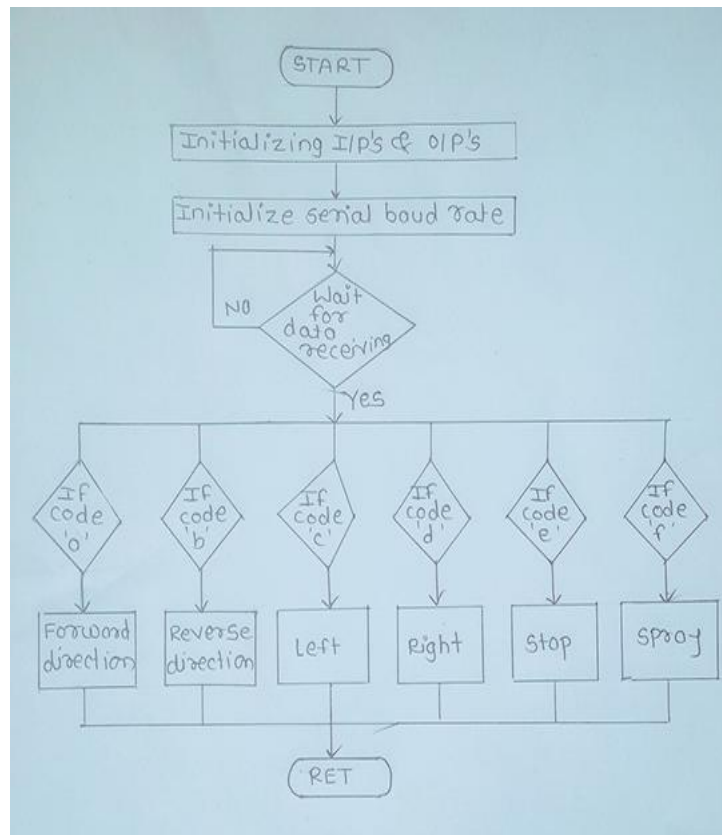


Fig5:Flow chart

**VI. EXPERIMENTAL RESULT**

According to command received from android app the robot motion can be controlled. The robot in the project can be made to move in all the four direction and spraying pesticide using android app. The control system has good stability and reliability. The experiment showed that the robot can basically complete the work of automatic controlled and meet spraying requirements in the greenhouse.



Fig6: Experimental Model

**VII. CONCLUSION**

The project experimental results shows that spraying mechanism will works properly. The Robot will be under control of user via android app. It provides safety to the farmers from harmful pesticides and also reduce the workload of farmers. In current situation effective farming can be carried out by such kind of application.

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