# SURVEY ON SMART ROBOTIC VEHICLE FOR AGRICULTURE APPLICATION

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*Abstract : This paper proposes smart robotic vehicle for agriculture. The smart agriculture robotic vehicle is a device used in agriculture to reduce the man power by using the mobile application. Rural efficiency depends on different factors, for example, water accessibility, soil fertility and nature of seeds, works, accessibility and associated farming hardware. Truly farming was done utilizing hand held instruments and as the human progress advanced individuals began utilizing creature driven apparatuses. One methodology is to use accessible data innovations as increasingly smart machines to decrease and target vitality contributions to more compelling courses than before. The robot which is controlled by the mobile application or by a program which is used for harvesting, Plough, spraying and cutting and also includes camera monitoring manner with the help of this mobile application.*

*Keyword- **Harvesting, Plough, Spraying, Cutting, Camera monitoring, Mobile android app***

### INTRODUCTION

The possibility of automated agribusiness (rural conditions adjusted by savvy machines) is anything but another one. Numerous specialists have created driverless tractors previously however they have not been fruitful as they didn't be able to grasp the multifaceted nature of this present reality. The greater part of them expected a modern style of cultivating where everything was known before hand and the machines could work completely in predefined ways – much like a generation line. The methodology is currently to create more astute machines that are sufficiently clever to work in an unmodified or semi indigenous habitat. These machines don't need to be wise in the manner in which we consider individuals to be canny however should show reasonable conduct in perceived settings. The task to address is to design an intelligent system that can perform in an original or semi natural conditions. This system should not have to be as intelligent as human being but must show sensible behavior in context of recognition.



Figure: Portal crop scouting platform

In pasta, agriculturists for the most part rely upon ordinary agrarian gear, which relied upon bullock, camels and so forth. This undertaking contains microcontroller as a fundamental gadget it is effectively available gadget for controller and driving of different gadgets like DC engine and so forth. It will work automatically till the finish of seed chamber just customary consideration ought to need to client on seed chamber [1].

The new innovation has a programmed mode in which it can take its own choice for challenging. Seed detection, DNA mapping and weeding are the a few highlights added to this [2]. In India, almost around 70 percent of individuals are relying on farming.

### METHODOLOGY

The new innovation has a programmed mode in which it can take its own choice for battling. Notwithstanding this it likewise incorporates a portion of the highlights like seed discovery, DNA mapping, weeding, smaller scale splashing, water system and reaping.

In this innovation, at first the robot will test the dirt of the place where there is developing region. In the wake of testing the dirt, it will put the seed and observing the status of the seed. The checking status principally characterizes the climatic conditions. After the plant develops, it will checks the DNA structure of the developing plant with the transferred structure and improves its supplements by transformation. The checking of the plant will occur and climatic conditions are likewise estimated. At last it will develop the plant with enhanced supplements.
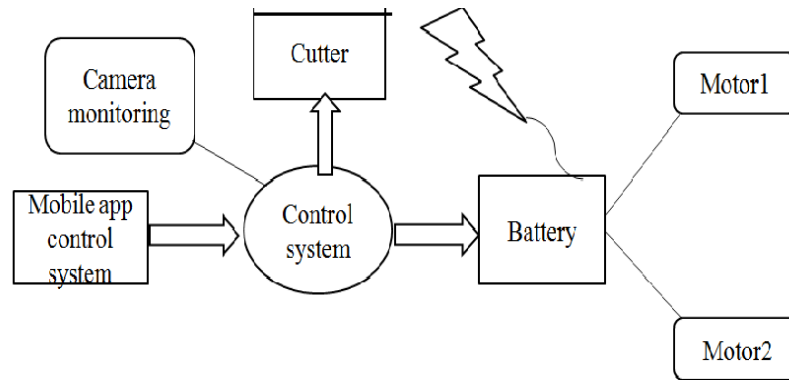
Figure: Block Diagram

The methodology of treating harvest and soil specifically as per their requirements by little self-governing machines is the regular subsequent stage in the advancement of Precision Farming (PF) as it decreases the field scale directly down to the person plant or Phytotechnology. One basic meaning of PF is making the best decision in the perfect place at the opportune time with the appropriate sum. This definition not just applies to mechanical horticulture (RA) and phytotechnology yet it likewise infers a dimension of

computerization innate in the machines. Programmed detecting and control (in a hurry) for each undertaking is additionally vital and numerous investigate papers have demonstrated that these frameworks are practical yet most are excessively moderate, and subsequently not financially feasible, to be worked on a kept an eye on tractor. When these frameworks are mounted on a self-governing vehicle, they may well all of a sudden progress toward becoming economically feasible

By taking a systems approach, in which we consider a system in terms of its actions, interactions and implications, we can develop a new mechanization system that collectively deals with all the crop's agronomic needs in a better way. To do this we must stop defining plant care in terms of the current mechanization but in terms of what the plant needs. When we have defined the actual plant requirements we are then free to design a better way of dealing with them.

### Modern Agriculture

Present day agriculture utilizes a great deal of vitality. It comes in numerous structures from composts and synthetics to tractors and fuel. The Phytotechnology approach endeavors to focus on the acquainted vitality with enhance viability. Chamen (1994) distinguished that a 70% vitality sparing can be made in development vitality by moving from customary dealt frameworks to a non-dealt framework. This was for shallow furrowing and did exclude any profound releasing. From this we gauge that 80-90% of the vitality going into customary development is there to fix the harm done by vast tractors. It would be vastly improved to not cause compaction in any case which is one of the reasons that drives us to think about utilizing little light machines.

### Robotic Irrigation

An automated irrigator as a mechatronic sprinkler (to reenact a voyaging precipitation firearm) was produced to apply variable rates of water and chemigation to predefined territories. The direction and segment points of the stream were constrained by stepper engines and could be balanced agreeing the ebb and flow climate and the ideal example by a little PC When the airborne water was blown down wind, the fly edges could be changed in accordance with repay by estimating the immediate breeze speed and heading (Turker et al. 1998). This framework couldn't just apply the required water in the ideal place however could flood into field corners.

### Harvesting and Plough

Harvesting includes the idea of just collecting those parts of the product that meet certain quality limits. It very well may be viewed as a kind of pre arranging dependent on tactile observation. Models are to just gather grain underneath a settled protein content or join grain that is dry enough (and leave the rest to dry out) or to choose and gather foods grown from the ground that meet a size criteria. As these criteria frequently pull in quality premiums, expanded financial returns could legitimize the extra detecting.

To have the capacity to do specific collecting adequately, two criteria are required; the capacity to detect the quality factor before gather and the capacity to collect the result of enthusiasm without harming the rest of the product. Most farming gear is getting greater and henceforth not suited for this methodology. Littler increasingly adaptable particular reaping gear is required. Either the yield can be overviewed before reap so that the data required about where the yield of intrigue is found, or that the reaper may have sensors mounted that can learn the product condition.

### Crop care

One of the fundamental activities inside great administration is the capacity to gather convenient and exact data. Measured information has would in general be costly and inspecting expenses can rapidly out gauge the advantages of spatially factor the executives. (Godwin et al. 2001) Information gathering would be more affordable and timelier if a computerized framework could stay in the harvest conveying a scope of sensors to survey crop wellbeing and status. A high freedom stage is expected to convey instruments over the yield shade and use GPS. Littler sub overhang machines have been created in understudy rivalries.

**Micro Spraying**

Inside the near yield zone, incredible consideration must be taken not to harm the harvest nor bother the dirt. One strategy for murdering weeds near the yield plants is to utilize a miniaturized scale shower that conveys little sums straightforwardly on to the weed leaf. Machine vision can be utilized to recognize the situation of an individual weed plant and a lot of spouts mounted near one another can squirt a herbicide on to the weed. Tests have demonstrated that sprinkling can be diminished when a gel is utilized as a transporter instead of water (Lund and Sogaard 2005).Different preliminaries have demonstrated that when the perfect measure of herbicide is set morally justified path at the correct time, the utilization of herbicide can be radically diminished to around 1 gram per hectare for a pervasion of 100 weeds for every square meter (Graglia 2004).
A smaller scale shower framework is presently a work in progress at DIAS Bygholm, in Denmark.

**Bluetooth Control System**
The paper aims on designing a robot that could be operated using android mobile phone. The controlling of the robot is done wirelessly through Android smart phone by using the Bluetooth feature of the smart phone. This Project is on the android smart phone remote control for operating the robot. Android is a software stack for mobile devices that includes an operating system, middle ware and key applications. Android boasts a healthy array of connectivity options on Bluetooth connection. Bluetooth is an open standard specification for a radio frequency (RF)-based, short-range connectivity technology that promises to change the face of computing and wireless communication. It is designed to be used in mobile phones.
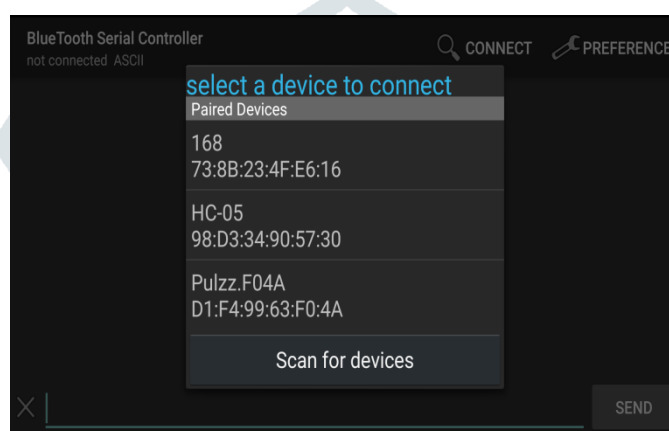


Figure: Bluetooth Connection

**Mobile Application Control System**
The over view of the Paper is with the help of mobile application as well as using the bluetooth application, we can operate the mobile robotic vehicles forward, backward, turn left and turn right easily. Following the same principle, we control and operate the Sprayer pump, Plough, Tiller, Harvesting and Cutting machine through the very Bluetooth facility. In addition to that, the Camera monitoring system functions to monitor all those above Mechanisms perfectly. At the outset, this diagram plays a vital role to recharge battery to run the motor affixed with these robotics vehicles.
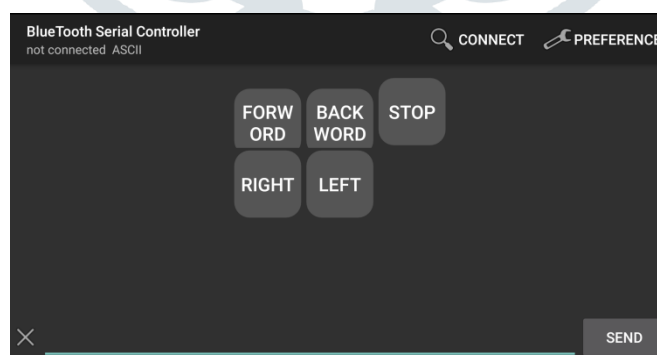


Figure: Mobile Application

**CONCLUSIONS**

Now a day's every where a common technology will be used but in this type of agricultural research study it will be something different result provide by using this multifunctional robot. In this study has group out a vision of how aspects of crop generation could be automated one. Although exist manned operations can be sufficient over big area there is a potential for decreeing the scale of remedy with autonomous robots that may result in even higher capable & efficient. The manufacturer process may be raising but the overall concept requires a paradigm shift in the way we think about mechanization for crop production that is based more on plant needs and novel ways of encounter them rather than developed existing methodology & technology.

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