

Bluetooth Based Atal Krishi Mitra Robot

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Abstract

We know that technology and machines play a vital role in enhancing agricultural productivity but not every farmer can afford these expensive resources. Our motive in this project is to make agriculture work (like-Harvesting, Cultivating, Digging, Cropping, Spraying insecticides, Ploughing) with more convenient and also in less time. Our project is helpful to increase agricultural productivity and reduce costs incurred by farmers using "BLUETOOTH Technology". The ATAL KRISHI MITRA is a robotic machine through which robotic farming will be done. In the recent years, the technological progress is increasing rapidly. This technology is increasing in all the fields like agriculture, robotics, industrial purpose, etc. Nowadays, the technologies are so developed that it is implemented in the agriculture also. The project aims on the design and development of a robot that will be used in the field of agriculture. This robot can help the farmers to perform cultivating, Harvesting, cutting the crop, sowing seeds, water, insecticide and pesticide sprinkling, Labelling the field, & Transportation. The robot can minimize the pressure on the farmers in addition to increase the speed, accuracy and quantity. Using the robotic technology, we can increase the yield of the crops and the quality of the farming. We are using microcontroller to provide the input to the robot. By using the microcontroller, we setup the connection between robot and the Smartphone. With the help of smartphone, the farmers can do the farming easily. The farmers can easily establish the connection between the robot and the smartphone. And as per the user instruction, the robot will perform the operations. Through Innovation

INTRODUCTION

The ATAL KRISHI MITRA is a robotic machine through which robotic farming will be done. Along with ploughing the fields, sowing of seeds and spraying of medicines will also be done in the crop. When the crop is ready to be harvested, then the work of harvesting and milling will also be done through it using Bluetooth according to the instructed commands. Through this project we want to aware the farmers that despite using expensive modern machinery they should use robotic farming because of its important features. This machine can potentially increase the output for farmers which resulting

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in increased the production in the farm.With the help of our project farmers can earn the profits as well as save their time. In the recent years, the technological progress is increasing rapidly. This technologies are so developed that it is implemented in the agriculture also. The project aims on the design and development of a robot that will be used in the field of agriculture. This robot can help the farmers to perform cultivating, Harvesting, cutting the crop, sowing seeds, water, insecticide and pesticide sprinkling, Labelling the field, & Transportation. The robot can minimize the pressure on the farmers in addition to increase the speed, accuracy and quantity. Using the robotic technology, we can increase the yield of the crops and the quality of the farming. We are using microcontroller to provide the input to the robot. By using the microcontroller, we setup the connection between robot and the Smartphone. With the help of smartphone, the farmers can do the farming easily. The farmers can easily establish the connection between the robot and the smartphone. And as per the user instruction, the robot will perform the operations.

NEED OF THE STUDY

We know that technology and machines play a vital role in enhancing agricultural productivity but not every farmer can afford these expensive resources. Our motive in this project is to make agriculture work (like- Harvesting, Sowing seeds, project is helpful to increase agricultural Cultivating, Digging, Cropping, Spraying insecticides, Ploughing) with more convenient and also in less time. Our productivity and reduce costs incurred by farmers using "Bluetooth Technology". The history of agriculture in India dates back to the Indus Valley Civilization. India ranks second worldwide in farm outputs. As per 2018, agriculture employed more than 50% of the Indian work force and contributed 17–18% to country's GDP. In 2016, agriculture and allied sectors like animal husbandry, forestry and fisheries accounted for 15.4% of the GDP (gross domestic product) with about 41.49% of the workforce in 2020. India ranks first in the world with highest net cropped area followed by US and China. The economic contribution of agriculture to India's GDP is steadily declining with the country's broad-based economic growth. Still, agriculture is demographically the broadest economic sector and plays a significant role in the overall socioeconomic fabric of India^[21]. Technologies is updating day by day and it is applying in all the areas in the world. It also implemented in the agriculture field to increase the quality and quantity of the crops and give farmers some rest. Technology in agriculture affects many areas of agriculture, such as fertilizers, pesticides, seed technology, etc. Biotechnology and genetic engineering have resulted in pest resistance and increased crop yields. Mechanization has led to efficient tilling, harvesting, and a reduction in manual labour. Irrigation methods and transportation systems have improved, processing machinery has reduced wastage etc., and the effect is visible in all areas. New-age technologies focus on robotics, precision agriculture, artificial intelligence, block chain technology, and more. Some technological advancements that have innovated agriculture:

- **Improved productivity from mechanization of agriculture** To reduce manual labour and make the processes faster, combine harvesters are finding greater use. Indian farming is characterized by small landholdings, and the need is to partner with others to take advantage of modern machines.
- **Climate/ weather prediction through artificial intelligence** -A major advance in agriculture is the use of artificial intelligence (AI). Modern equipment and tools based on AI enable data gathering and assist in precision farming and informed decision-making.

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Our project is helpful to increase agricultural productivity and reduce costs incurred by farmers using "BLUETOOTH TECHNOLOGY".

3.1Population and Sample

The history of agriculture in India dates back to the Indus Valley Civilization. India ranks second worldwide in farm outputs. As per 2018, agriculture employed more than 50% of the Indian work force and contributed 17–18% to country's GDP. In 2016, agriculture and allied sectors like animal husbandry, forestry and fisheries accounted for 15.4% of the GDP (gross domestic product) with about 41.49% of the workforce in 2020. India ranks first in the world with highest net cropped area followed by US and China. The economic contribution of agriculture to India's GDP is steadily declining with the country's broad-based economic growth. Still, agriculture is demographically the broadest economic sector and plays a significant role in the overall socioeconomic fabric of India^[21]. Technologies is updating day by day and it is applying in all the areas in the world. It also implemented in the agriculture field to increase the quality and quantity of the crops and give farmers some rest. Technology in agriculture affects many areas of agriculture, such as fertilizers, pesticides, seed technology, etc. Biotechnology and genetic engineering have resulted in pest resistance and increased crop yields. Mechanization has led to efficient tilling, harvesting, and a reduction in manual labour. Irrigation methods and transportation systems have improved, processing machinery has reduced wastage etc., and the effect is visible in all areas. New-age technologies focus on robotics, precision agriculture, artificial intelligence, block chain technology, and more. Some technological advancements that have innovated agriculture.

3.2 Data and Sources of Data

As technology progresses, so too does the scope of what is considered robotics. In 2005, 90% of all robots could be found assembling cars in automotive factories. These robots consist mainly of mechanical arms tasked with welding or screwing on certain parts of a car. Today, we're seeing an evolved and expanded definition of robotics that includes the development, creation and use of bots that explore Earth's harshest conditions, robots that assist lawenforcement and even robots that assist in almost every facet of healthcare. The history of agriculture in India dates back to the Indus Valley Civilization. India ranks second worldwide in farm outputs. As per 2018, agriculture employed more than 50% of the Indian work force and contributed 17–18% to country's GDP. In 2016, agriculture and allied sectors like animal husbandry, forestry and fisheries accounted for 15.4% of the GDP (gross domestic product) with about 41.49% of the workforce in 2020. India ranks first in the world with highest net cropped area followed by US and China.

3.3 Theoretical framework

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RESEARCH METHODOLOGY

The main aim to make a multipurpose robot which can do multiple agricultural work which farmers do like Cultivating, Harvesting, Cropping the field, Digging the field ,sowing seed, Spraying medicine, water spraying, pesticide and insecticide spraying and levelling the field. The whole system of the robot works on a power supply of 12V battery. The whole base is on a 4 DC motor which is connected to 4 channel Relay module which gives equal voltages to all the DC motor. There is also a flatter which level the field. The

robot can be moved with the helps of wheel which is connected to Relay module which is controlled by Bluetooth module and this module is connected with phone. When the user gives the input to the smart phone (ON or OFF) The Bluetooth module is connected with the one motor. The plough shape thing is attach to the second motor and last the seed sowing machine is attach is third motor. When the user gives the input from the Smartphone, the servo motor start rotating according to the angle given in the program.

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IV. RESULTS AND DISCUSSION

If we see the result of the project, then the result came is very good. Because the farmers do the farming using the manual things in the agriculture and also sometimes injured themselves during the farming. So, this robot can do the agricultural things using robotics things. The robot can give the moisture percentage of the field, it can sow seeds with the help of seed sowing system, can plough the field using the ploughing system, and can also give water to the crops. The robot can easily controlled by the smartphone, with the help of Node MCU we connect the smartphone Wi-Fi with it. With this Wi-Fi we can move the robot in any direction we want. And by using Bluetooth, we can on and off the seed sowing system, up and down the ploughing system. It is open-source Arduino software (IDE) which is shown in figure 2.8 make it easy to write and upload to the board. This software is used with any Arduino board. It runs on windows, Mac OS X, and Linux. The program is written in java and based on processing and other open source software. The Arduino IDE supports the languages C and C++ using rules of code structuring. In October 2019 the Arduino.CC has introduced Arduino Pro IDE with other advance features.

Serial No.	Components	Cost (in	Reason
		Rs)	
1.	Arduino UNO	<mark>500</mark>	To run the system.
2.	Node MCU	400	To run the robot.
3.	Servo motor	600	For
4.	Motor (4 Quantity)	800	To move the robot
5.	Motor Driver	150	To supply constant voltage and power.
6.	Jumper Wires	100	For connecting the components
7.	S <mark>oil Moistur</mark> e Module	150	To sense the moisture of soil
8.	Wheels	120	To move in different directions.
9.	Bluetooth Module	150	To move the seed sowing and ploughing
			system.
	Total	2820	

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