



DESIGN AND FABRICATION OF MULTIPURPOSE AGRICULTURAL ROBOT

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ABSTRACT

This approach is on the designing of agricultural robot for various tasks. Certainly, robots are playing an important role in the field of agriculture for farming process autonomously. In agriculture, the opportunity for robot is enhancing the productivity and the robots are appearing in the field in large number. The proposed system focuses on implementing all the farming process especially in the field of ploughing and seeding by using microcontroller, Bluetooth models, various sensors etc., In a continuation, the rest of remaining process could be done automatically. In recent years the development of the autonomous vehicles in the agriculture has experienced more interest. This robot will help the farmers in doing the farming process more accurate. The robot is a mechanical device which is capable of performing various tasks without human intervention. The robot works based on command given by the controller. Various sensors are used for sensing various parameters along the robotic path. The microcontroller being the heart of the robotic system manipulates entire the action of the robotic system. It also controls a wheel motion by controlling the DC motors. Motor driving circuit is used to drive the DC motors which in turn control the wheel motion. The seeding robot for agricultural purpose is an autonomous robot which is controlled remotely through a wireless Bluetooth connectivity between the Smartphone and the robot. The Bluetooth electronics app is used to operate the robot. It is used to control each and every operation of the robot. Agricultural robot or " Agribot " is a robot used for agricultural purposes. The advent of robots in agriculture drastically increased the productivity and output of agriculture in several countries. Further, the usage of robots in agriculture reduced the operating costs and lead time of agriculture. The current paper reviews the success stories of robotic agriculture in different areas of agriculture. The work also throws light on the future scope of robotic agriculture especially in developing countries.

INTRODUCTION

Agriculture is the backbone of India. The history of Agriculture in India dates back to Indus Valley Civilization Era and even before that in some parts of Southern India. Today, India ranks second worldwide in farm output. The special vehicles play a major role in various fields such as industrial, medical, military applications etc. The special vehicle field are gradually increasing its productivity in agriculture field. Some of the major problems in the Indian agricultural are rising of input costs, availability of skilled labours, lack of water resources and crop monitoring. To overcome these problems, the automation technologies were used in agriculture. The agricultural census gives vital information on the distribution of land holdings in our country. According to the census majority of the farmers are having the land less than 1 hectare. This is one of the major drawbacks for the mechanization in agricultural sector in India. The vehicles are being developed for the processes for ploughing, seed sowing, levelling, water spraying. All of these functions have not yet performed using a single vehicle. In this the robots are developed to concentrate in an efficient manner and also it is expected to perform the operations autonomously. The proposed idea implements the vehicle to perform the functions such as ploughing, seed sowing, mud levelling, water spraying. These functions can be integrated into a single vehicle and then performed. Indian economy is based on agriculture. The backbones for food production are farmers. Traditionally farming is done by human being with the help of bullock carts, tractors and tillers etc. In modern era, the main problem in agricultural field includes lack of labour availability, lack of knowledge regarding soil testing, increase in labour wages, wastage of seeds and more wastage in water. To overcome all these disadvantages the robot for agriculture has been developed. The main aim of agricultural robot is applying robotic technology in agricultural field. The agriculture robot efficiently performs ploughing, seeding and mud levelling automatically. The robot is a mechanical device which is capable of performing various tasks without human intervention. The robot works based on command given by the controller. Various sensors are used for sensing various parameters along the robotic path. The microcontroller being the heart of the robotic system manipulates entire the action of the robotic system. It also controls a wheel motion by controlling the DC motors. Motor driving circuit is used to drive the DC motor which in turn controls the wheel motion. Controlling of the robot mainly require some means of communication. One of the communication means is the wireless Bluetooth connectivity. Bluetooth modules that are used to control the robot using Smartphone. The Bluetooth application is user friendly and data exchanging between robot and smartphones is done systematically. The developed robot is focused on agricultural purposes like cutting, water spraying, sowing and mud levelling. The robot can operate in any weather conditions. The agricultural robot mainly tests the soil using soil moisture sensor, in addition to this the temperature and humidity sensors also been used. As the robot is controlled by using Bluetooth the individual operations can be performed separately.

PROBLEM STATEMENT

Agriculture is a very important sector in Indian economy. Most of the livelihood in India depends on agriculture. As the knowledge-based farm labours are less, the requirement for them is high and their wages are increasing. Traditionally farming is done by human being with the help of bullock carts, tractors and tillers etc. The main problem in agricultural field includes lack of labour availability, lack of knowledge regarding soil testing, increase in labour wages, wastage of seeds and more wastage in water. The idea of applying robotics technology in the field of agriculture is very new. In agriculture, the opportunity for robot-enhanced productivity is more and the robots are appearing on farms in various guises and in increasing numbers.

AIM & OBJECTIVES

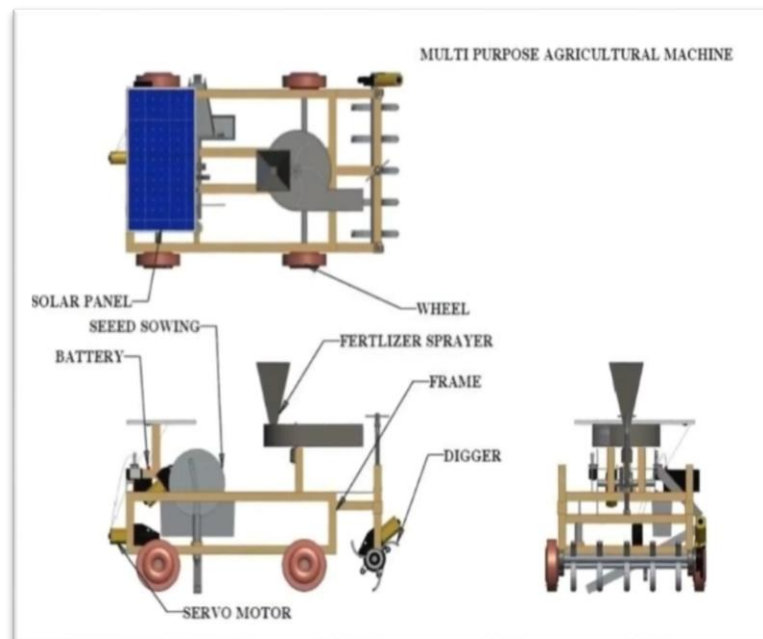
- This project objective is to design and fabricate a solar operated agricultural robot which can perform the operations like,
 - Cultivating operation.
 - Seed sowing operation.
 - Crop cutting operation.
 - Water spraying operation.

- The ground should be dug to the specified depth and the adequate number of seeds must be dispensed then it should level the mud after seeding operation.
- To reduce human effort in the agricultural field with the use of small robot.
- To build a battery operated smart agricultural robot for multipurpose farm activities.

FUTURE SCOPE

Every machine has scope for its future modification for gaining more and more beneficial output with the least input. Hence human is always trying for achieving it. Being technology, it comes under the research and development activity. Our product being the small and compact one, still it has so many scopes for its future developments as following: - 1) In this project we can use the solar panel to capture and convert solar energy into electrical energy which in turn is used to charge a 12v battery which then gives necessary power to a DC motor.

FIGURE



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