Google kisan-an autonomous IOT-agrobot controlled over google voice

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ABSTRACT

About 40 percent of the world's population relies on the agriculture field. Apart from traditional farming, recent years have demanded the application of autonomous vehicles in agriculture. The proposed system aims at designing an autonomous agricultural robot that can be controlled through IoT providing real-time monitoring of the field thereby improving the irrigation system. The system can be controlled by an IoT module. Thus this project simplifies the technology for farmers using voice. This project involves development of completely autonomous agricultural machines which can be used for different applications such as spraying, sowing, irrigation using voice commands over IOT where farmers can operate the machine in the farm form any corner of the world using voice The system uses speech recognition and can detect the voice commands of the farmers and trigger the vehicle in farm remotely using IOT. The machine is capable of performing multiple operations such as sowing, spraying, cutting and more. Since the machine is voice activated, the farmers can easily control the machine as it involves just voice commands. Further the machine operates over IOT and is autonomous, so that farmer can control the machine from any corner of the world. Thus this project provides an completely economical solution to problems faced by farmers and automating agricultural operations improving productivity. *Further the machine is solar powered which not only makes it green but also ecofriendly and cost free for farmers.*

Keywords: *Autonomous, Cutting, voice, IOT, Labor, Sowing, Solar, Spraying, Tilling, etc.*

I.INTRODUCTION

Agriculture is the backbone of economic system of a specified country standard techniques of farming rely on Man power and old procedures such as the application of synthetic chemical fertilizers, pesticides, herbicides and genetically changed creatures. To carry out similar tasks with efficiency, we make use of agricultural robotics. Agribots can spot the existence of diseases, weeds, insect infestations and other stress circumstances. Agri robots are lightweight. Agricultural robot can be controlled by an android application which is helpful for the farmers livelihood. An android application is used to monitor Agribot. This indeed supports the farmer's livelihood. Nevertheless, current methodologies that permit highly mechanised group of primary phenotypic data for compact numbers of plants in the greenhouse fall far short of the requirement to look into and distinguish plenty of plants under real world circumstances. Building structures that can gather multi-modal, multicharacter data in real time in the field needs joining plant biology and crop science with robotic vision and computer engineering. These structures should be precise and dependable, and should supply exceptional facts than the present routine accessible for automated greenhouse or physical field phenotyping. This will assist us to associate plant genotypes in additional to the molecular and ecophysiological responses with the interpretation of particular phenotypes in retaliation to the flourishing surroundings.

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 include lack of labor availability, lack of knowledge regarding soil testing, increase in labor wages, wastage of seeds and more wastage in water. To overcome all these disadvantages the robot for agriculture has been developed.

The proposed project can be controlled from any corner of the world using voice commands by farmers. The proposed project can recognize the command the farmer gives and can start performing that particular operation in the field. The project is solar powered hence it is clean, green and ecofriendly. The system being autonomous redueces the burden on farmers.

II.PROBLEM STATEMENT

- Agriculture is a very important sector in Indian economy. Most of the livelihood in India depends on agriculture.
- As the knowledge based farmlabours 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 include lack of labor availability, lack of knowledge regarding soil testing, increase in labor 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 robotsare appearing on farms in various guises and in increasing numbers.

III.LITERATURE REVIEW

[1] According to Kawadaskar, The basic objective of sowing operation is to put the seed and fertilizer in rows at desired depth and spacing, cover the seeds with soil and provide proper compaction over the seed. The recommended row to row spacing, seed rate, seed to seed spacing and depth of seed placement vary from crop to crop and for different agricultural and climatic conditions to achieve optimum yields and an efficient sowing machine should attempt to fulfill these requirements.

[2] S. Chandika reviewed that lack of man power has resulted in spending a lot of money in seed sowing, which is not only time consuming but also not accurate.

[3] Mahesh R. Pundkar stated that the seed sowing machine is a key component of agriculture field. High precision pneumatic planters have been developed for many verities of crops, for a wide range of seed sizes, resulting to uniform seeds distribution along the travel path , in seed spacing.

[4] P.P. Shelke, concludes that bullock drawn planters are becoming necessity for sowing as the skilled workers for sowing are almost diminishing. Planting distance and plant population are crucial factors in maximizing the yields of crops.

[5] Singh, revealed that by using a seed drill for wheat crop there was an increase in yield by 13.025 percent when compared with the conventional method, it also revealed that by using a seed drill for wheat crop, a saving of 69.96 per cent in man-hours and 55.17 percent in hillock hours was achieved when compared, with the conventional method.

IV. OBJECTIVES

- To develop an agricultural robot which can be controlled by voice commands from farmers using smart speech device developed to detect the voice commands of farmers
- To implement IOT based control system, which can be used to give commands from anywhere in the world using internet
- To implement seed sowing systems in the project so that the project can be used for sowing the seeds.
- To implement Spraying system in the machine so that the machine can be used for the spraying operation
- To implement the Cutting mechanisms so that machine can be used for cutting operation
- To make the system solar powered so that it is green, ecofriendly and cost free for farmers to operate
- To make the system automated so that it is totally autonomous and performs above operations autonomously once the farmers gives commands using speech commands.
- To make the system easy to operate and multipurpose to autonomously do day to day tasks.

V.METHODOLOGY

Working Principle: The illustrative diagram below shows the working principle of the project. As shown in the illustrative diagram, the system consists of voice controlled agriculture Robot. The Robot will reside in the farm waiting for farmers commands. When the farmer gives voice commands using the device which is present with the farmers, the system starts working. The farmers voice is detected and speech recognition system finds out which particular command farmer has given. The command is recognized and sent to the cloud server which will then command the machine to perform those operations. The machine is also totally autonomous and does not require any manual intervention. The solar energy provides all the energy to the machine to operate. The farmer can sit in home and control all the agricultural operations in the field using voice commands over IOT.

1. Selection of frame material:

Since the frame or chasis forms te integral part of the project on which all the other components can be mounted, care has be taken whlie choosing the material for the frame of the project.

2. Choosing the optimum drive system:

A proper drive system is needed for transmitting the power from motors to the spinning disc. Thus it is necessary to select the drive systme in such a way that it is most efficient to with minimum maintenance.Also the slected drive system for the machine should have a proper transfer of energy and have least maintenance.

3. Hopper Fabrication:

The hopper is ued for storing the seeds to be sowed. The hopper is proposed to be made using 1.6 mm sheet metal using welding and cutting.

4. Chassis Fabrication:

With the selected frame the next step is fabrication of the chassis. The chassis should be so fabricated that is is light weight , withstaand all the forces and should have sufficient space for mounting all the components. The chassis also should sustain the forces which are induced as a result of tilling mechaism as tilling attachment is a part of chassis and is fabricated during the chassis fabrication itself.

5. The Spraying sytem development: In this phase the spraying system of the project is developed. The spraying system is responsible for performing the spraying operation in the farm once the farmer commands the spraying operation from Robo assitant.

6. The cutting attachment:

The cutting attachment is responsible for cutting . Once the command for cutting is received the same will be performed by the agrobot across the field.

7. The Voice control system:

In this phase the voice and speech recognition system is developed which is linked to the agrobot over internet. This involves developmet of voice recognition application to connect the machine to the internet. The farmers can give voice commands to the machine using speech recognition system developed which can detect the control commands and send it to the cloud server to operate the robot in the field using Interent of things.

8. Constant pitch seed sowing mechnism:

In this phase the constant pitch seed sowing mechanism is fabricated. This mechanism is responsible for dropping the seeds exactly at one feet as the machine is operated across the farm.

9. The Internet Control system:

The voice commands given by farmers using are sent to internet. In this phase the internet control system is developed to make the machine solar powered and automated. This provides the facility for farmers to control the machine from anywhere in the world.

10. Assembly:

The components fabricated in the above phases are assembled to fom a complete machine in this phase

11. Testing : The testing is carrried out in this phase and optimizations if any are done.

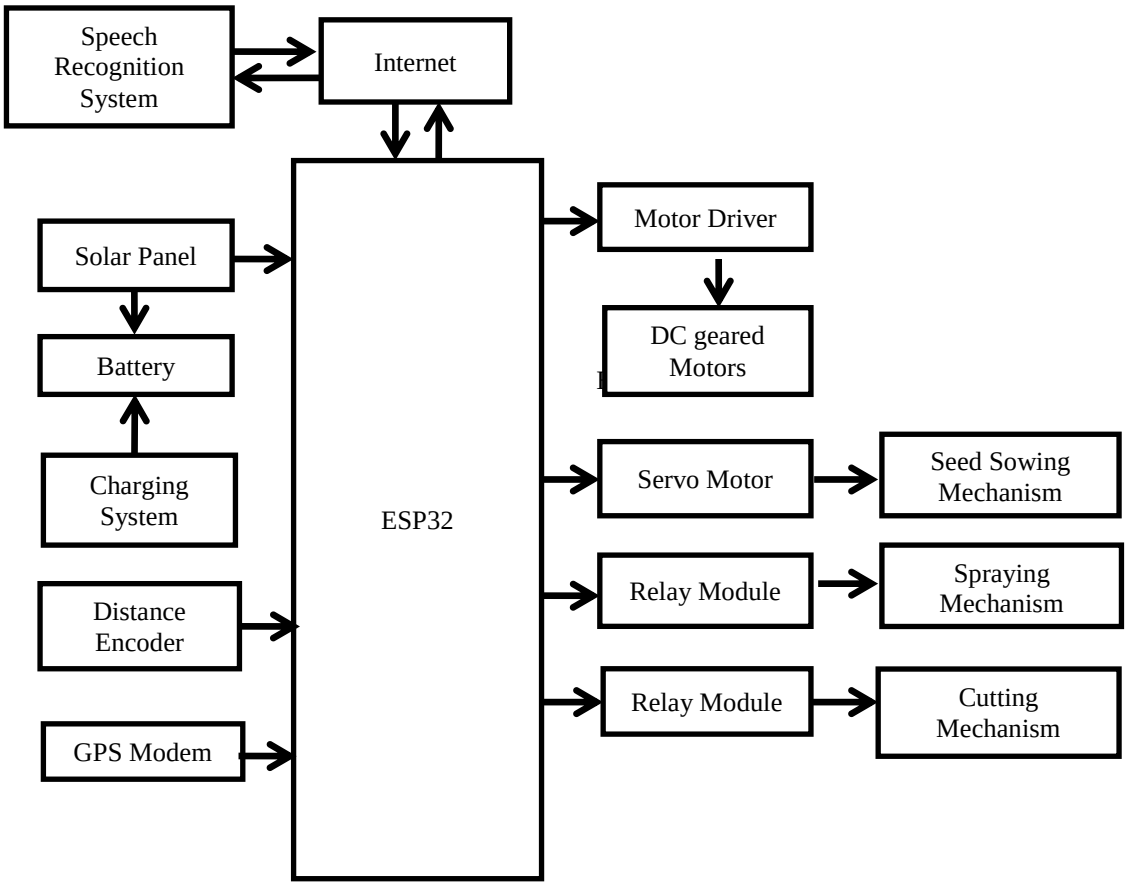

Fig: Block Diagram of Proposed System

VI. CONCLUSION

- The proposed project deals with implementation of Google kisan system.
- This developed system detect farmers voice and find out the particular command given by farmer and act accordingly.
- It is the machine is totally autonomous and doesn't require any manual interaction from farmer side.
- It also used in the absence of farmer through voice commands of farmer.

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