Agriculture Robotics

G.Tejaswani[1], Afroz.B[2], Vidya shree.M[3], Shruthi.Y[4], Sunitha.S[5]
(UG), Department of Computer Science & Engineering,
Rao Bahadhur Y. Mahabaleswarappa Engineering
Collage, Ballari, Karnataka, India.
[5]Department of Computer Science & Engineering,
Rao Bahadhur Y. Mahabaleswarappa Engineering
Collage, Ballari, Karnataka, India.

Abstract:
In this paper we are going to present about Agriculture Robot how farmer can perform plowing, seeding and grass cutting in fields. To perform this operation by using the agriculture robot we can reduce the labor work. We are using the android application to provide the input to the robot. By using GSM we are going to communicate with the robot. This system has three main sections like seeding, plowing and waste plant cutting. As per the user instruction the robot will perform the operation without human presence. It automatically stops when there is any abstracal comes in between and it sends the message regarding the abstracal to the user. By using, ultrasonic sensor it detects the abstract which comes in front of the robot.

Keywords: Ultrasonic sensor, Robotic technology, Solar Panel, Battery, Microcontroller, GSM.

1. Introduction

Indian agriculture has begun in early days by 9000 BCE as a result of early cultivation of plants, and domestication of crops and animals. Agriculture is the one of the main occupation in INDIA. They were using animals to perform these operations. Our history of agriculture contains many examples of the use of tools, such as the hoe and the plough. Due to rapid development in technology farming become much less labor sensitive and many other problems are occurred in the agricultural field. By this People are tired of doing the agricultural activities in the sunlight and their health is also affected very much by doing the heavy work in the fields. People were seeding by manual method includes broadcasting the seeds by hand.

2. Purpose

The aim of our project is to perform agriculture work, By using this robotic technology the farmer can perform these all operation just by sitting in a cool place and can do plowing, seeding and grass cutting. The basic idea in this paper is to develop a mechanized device that helps farmers to perform operations like seeding/seed sowing at pre-designated distances and depth. So now it's not necessary to do seeding in sunlight. By using robot technology one can easily perform these all operation by providing the input to the robot it performs the operation according to the data given by the user.

3. Existing system

In existing system day by day farmers are struggling and facing many problems like finding labors and working hard without caring about the climate and about their health conditions.

4. Proposed system

In this paper we are able to reduce the efforts of the farmer and also saves the time, energy and cost required to perform these operations by making use of robotic technology in order to improve the performance efficiency in agriculture field.

Existing with Proposed System Comparison

Properties	Existing system	Proposed system
plowing		
Grass cutting		
Seed sowing		

Fig 1: Existing system and proposed system

5. Literature Survey

5.1 Automated Agribusiness Furrowing Seeding and Grass Cutting Utilizing Android Smartphone

Author: Deekshitha K P, P Prasanna

The paper aims on the design, development & the fabrication of the robot which can put the seeds, depth of soil, plough the land, cutting the waste plant these whole systems of robot works with battery.

5.2 A Review On Multi-Seed Sowing Machine

Author: Mahesh R. Pundkar

Studied the performance of seed sowing devices by using image processing algorithm using MATLAB software. They also studied the effect of seed depth, seed spacing, miss seeding ratio and performance seed sowing device on germination of seed and efficiency of yield crop.

5.3 Design and Implementation of Seeding and Fertilizing Agriculture Robot

Author: Shivprasad B S, Ravishankara M N, B N Shoba

The aim of the designed system is to seeding, fertilizing and soil ph, temperature, moisture, humidity checking. The robot is controlled by remote. The designed system involves navigation of robot to the destination successfully and does the above functions. The direction of the robot is controlled via remote. The robot and the remote system are connected through internet system.

5.4 Robotic Agriculture Machine

Author:Gholap Dipak Dattatraya1, More Vaibhav Mhatardev2, Lokhande Manojkumar Shrihari3, Prof. Joshi S.G 4

This paper presents a system with high speed of operation for an advanced agriculture process which includes cultivation based on robotic platform. The robotic system is an electromechanical (conveys a sense that it has agency of its own) and artificial agent which is steered by DC motor which has four wheels. The farm is cultivated by the machine, depending on the crop considering particular rows & specific columns. The infrared sensor detects the obstacles in the path and it also senses turning position of vehicle at end of land. The seed block can be detected and solved using water pressure. The machine can be controlled remotely and solar panel is used to charge DC battery.
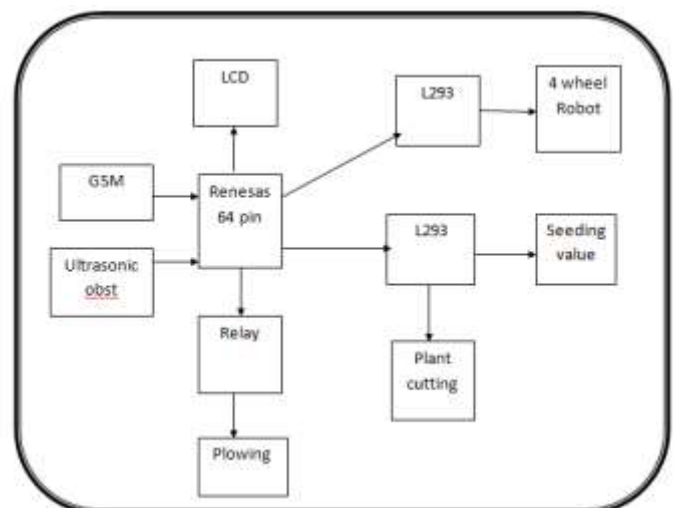
6. System Architecture

Fig 2: System block diagram

GSM is used for the communication purpose. It is similar to the Bluetooth. Ultrasonic sensor is used for detecting the abstracal which comes in front of the robot. Renesas 16 bit microcontroller is mainly used to control whole system. LCD is used to display the complete process of the robot. Relay is used to convert from high voltage to low voltage. By using tiller we are going to plow the land.L293 is driver which is used drive the DC motor. 4 wheels are used to drive the robot. Seeding is done by flexible and distributed pipe.
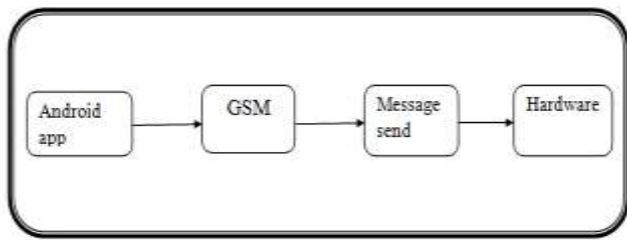
Fig 3: Data flow diagram

In this we are using Android Application to provide the input data to the robot. By using android mobile farmers can enter the data, and the entered data is sent to the robot through GSM . The robot performs the operation according to the input given by the user.
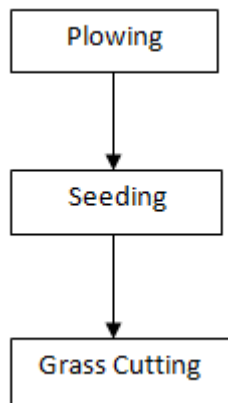

Fig 4: Main operations performed in fields.

7. Conclusion

In the agriculture field it will be very helpful for the farmers.

In order to perform some of the operations like plowing, seeding and grass cutting this can be easily adopted, flexible and can be operated by common man. It can be successfully implemented as a Real Time system with certain modifications. Going further, most of the units can be fabricated on a single along with microcontroller thus making the system compact there by making the existing system more effective.

To make the system applicable for real time purposes components with greater range needs to be implemented.

References

[1] Shivprasad B S, Ravishankara M N, B N Shoba "Design And Implementation Of Seeding And Fertilizing Agriculture Robot." International Journal of Application or Innovation in Engineering & Management (IJAIEM), Volume3, Issue6, June 2014 R. Caves, Multinational Enterprise and Economic Analysis, Cambridge University Press, Cambridge, 1982. (book style).

[2] REVOLUTIONIZING FARMING USING SWARM ROBOTICS By Anil H#1, Nikhil K S#2, Chaitra V#3, Gurusharan B S#4 .

[3] M. H. Almarsha di and S. M. Ismail. Effects of Precision Irrigation on Productivity and Water Use Efficiency of Alfalfa under Different Irrigation Methods in Arid Climates. Journal of Applied Sciences Research, 2011.

[4] Ankit Yadav1, Pranav Pandhare 2, Saleel Kulkarni3, Shubham Kale4, Soniya Zope5 Design and implementation of Smart Agriculture using Embedded System International Journal Of Engineering And Computer Science Science ISSN: 2319-7242 Volume 5 Issue 12 Dec. 2016, Page No. 19344-19347

[5] Amol B. Rohokale*, Pavan D. Shewale*, Sumit B.Pokharkar*, Keshav K. Sanap* A REVIEW ON MULTI-SEED SOWING MACHINE International Journal of Mechanical Engineering and Technology (IJMET), ISSN 0976 – 6340(Print), ISSN 0976 – 6359(Online), Volume 5, Issue 2, February (2014), pp. 180-186, © IAEME 180 *Students, Mechanical Engg. Dept. Marathwada Mitra Mandal's Institute of Technology, Lohegaon, Pune-411047