

# GSM Embedded Agriculture With Plowing, Seeding, Grass Cutting Powered by Solar Energy Using Android Application.

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**Abstract:** - This paper is based on IOT (Internet of Things). Nowadays a Variety of tasks are Based on IOT. This is a new trend in Technology. The main aim of this paper is to reduce the work and energy of the farmer. In India, nearly 70% people are dependent upon agriculture. So the agriculture system in India should be advanced to reduce the efforts of farmers. In agriculture field many operations are performed like seeding, weeding, waste plant cutting, plowing etc. and the very basic operation is seeding, plowing, grass cutting and the present method is very difficult to perform all operations and this method need heavy human resources. The drawbacks of the existing system will be removed successfully in this automatic machine.

**Keywords:** - Microcontroller (Renesas 64 bit), GSM modem, Ultrasonic sensor, L293, 4 wheels, Relay.

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## I. INTRODUCTION

Agriculture is the main occupation in India and nearly about 70% of people are dependent upon agriculture. So the agriculture system in India should be advanced to reduce the efforts of farmers. In agriculture field people are facing many problems like they have to work in sunlight and find the labor is very difficult. Today's agriculture field demands to find new ways of agricultural operation. So to make the work of the farmer easy in this paper we are going to discuss Robotic technology which is controlled by android application. The farmer can do the operation like plowing, seeding grass cutting easily by setting in a cool place using android application.

## II. LITERATURE SURVY

**A. 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.

**B. 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.

**C. 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.

**D. 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

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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.

**III. PURPOSE**

The main aim of this paper is to present agriculture operations like plowing, seeding, waste plant cutting (grass). By using the robotic technology the farmer can sit in a cool place and he can perform the above operations through android application by providing the input to the robot it performs the operation according to the data given by the farmer.

**Existing with Proposed System Comparison**

properties	Existing System s	Proposed System
Plowing		

**Figure 1: Plowing**

In Existing system plowing is done by the Animals,heavy equipments and with human presence. Animals were used to plow the land which is very harmful to those animals. To over come these problems we can move to the proposed system. Here one tiller is used to plow the land. By sitting in a cool place the farmer can plow the land easily and he can give the instruction through he application to that machine. As show in figure 1.

properties	Existing System s	Proposed System
Grass cutting		

**Figure 2: Waste plant cutting (grass cutting)**

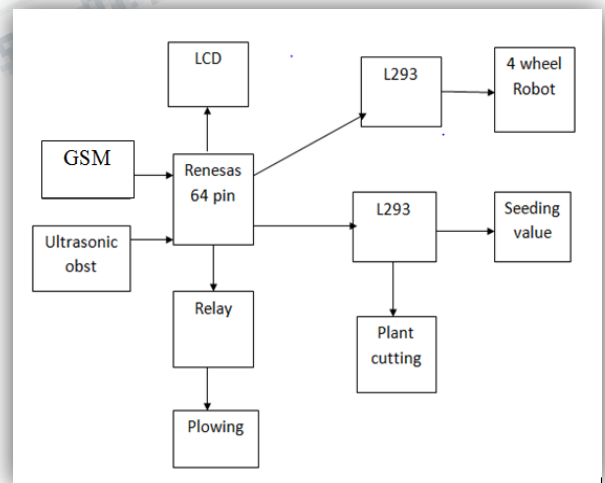
In Existing system the farmers are using the sharp equipment's with human presence to cut the waste plants or grass. In proposed system we are using sharp blades to cut the waste plants or grass easily, without using heavy equipment's and human presence. Here the farmer can sit in a place and monitor the machine through the application. As shown in figure 2.

properties	Existing System s	Proposed System
Seeding		

**Figure 3: Seeding**

In existing system seeding is done by using animals, tractors with human presence. Here the wastage of seeds is more. In proposed system we are using a flexible and distributed pipe to perform seed sowing. Here the wastage of seeds is less, we can perform this operation without using animals and less labors are required. Here by giving the input through android application we can seed the land easily. As show in Figure 3.

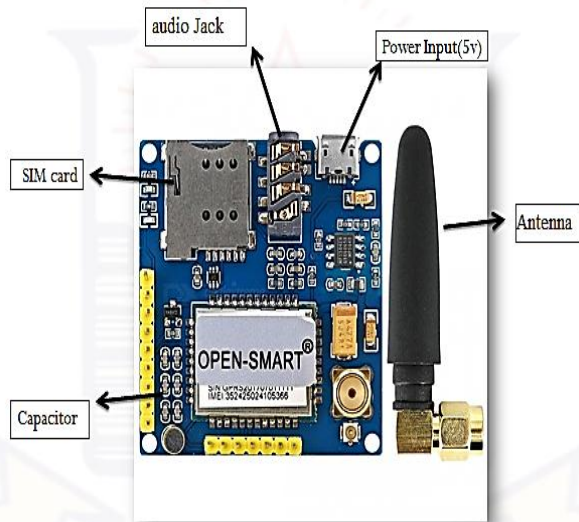
**Block Diagram**



**Figure 4: System Architecture**

GSM is a Global system for mobile communication and it is a wireless communication .GSM is used for communication between the android application and the robotic machine. The minimum range of GSM is

around 35 kilometers, by this we can send the data when we are in the range 35 kilometers.



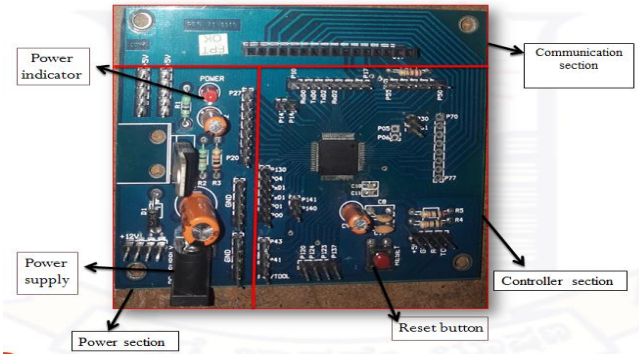
**Figure 5: GSM board**

Ultrasonic sensor: Ultrasonic sensor is also called as sonar sensor, here we are using HC sr04 model. The HC sr04 ultrasonic module has 4 pins. i.e ground, VCC, Trig and echo.



**Figure 6: Ultrasonic sensor**

Microcontroller: we are using Renesas 64 bit microcontroller. The microcontroller has 3 sections like power section, communication section, controller section.



**Figure 7: Renesas microcontroller**

LCD is a liquid crystal display which is used to display the complete process on the LCD screen. LCD is connected to the microcontroller which has a 16 pins (1X16).

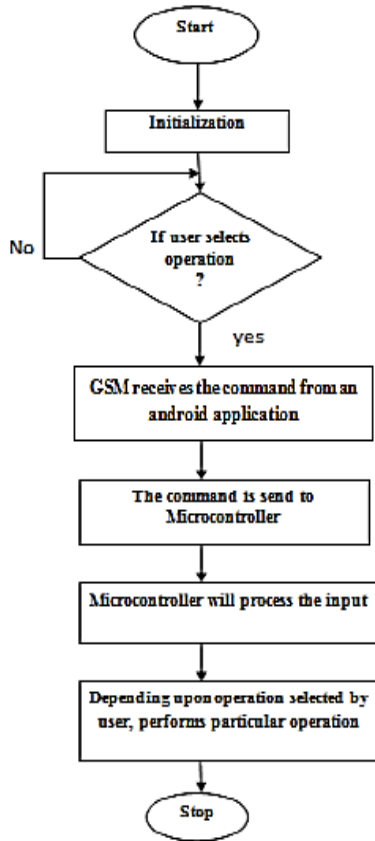


**Figure 8: LCD display**

Relay is an electrically operated or electromechanical switch. Relays are necessary when there must be electrical isolation between controlled and control circuits, or when multiple circuits need to be controlled by a single signal. Here relay are used to convert high volt to low volt. L293 is an integrated circuit motor driver that can be used for simultaneous, bi-directional control of small motors. Here L293D is used to drive the small DC motors, and 4 wheels are connected to the base of robotic machine, which is used to move towards left, right, forward, backward and turns around. For Seed sowing we are using a flexible and distributed pipe, by using this the wastage of seeds will be reduced. Plant cutting is done by using a sharp blades which is placed in front of the robot. By using L293 we are performing seed sowing and grass cutting operations. Plowing is done by using a tiller.



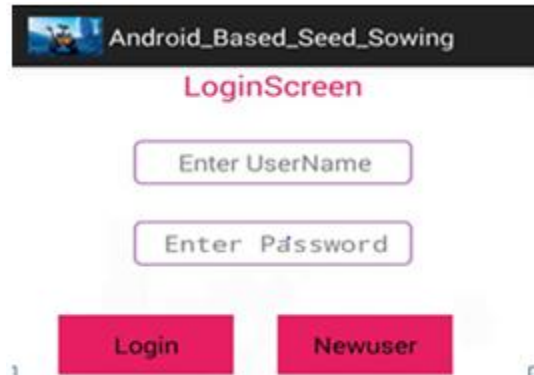
**V. FLOW CHART**



**Figure 9:Flow chart**

As shown in above figure: initially when the robotic machine starts once it checks all the operations and get ready to perform the operations given by user. When user gives input command to the robot by selecting the operations like plowing, seeding, grass cutting and GSM receives the input through network from android application and this input is sent to microcontroller and microcontroller will process this input command and perform the selected operations and after completing the system stop working. GSM is used to communicate with robot through android and send the operation to the Microcontroller. As per the guidelines given by the farmer the robot move in forward, turn around, left and right bearing to drop the seeds at a Specific position. Four wheels are associated at the base for the adaptable development of robot. Two DC engines are utilized to drive the wheels associated with the robot. L293D is utilized to drive the DC engines.

**VI. WORKING**



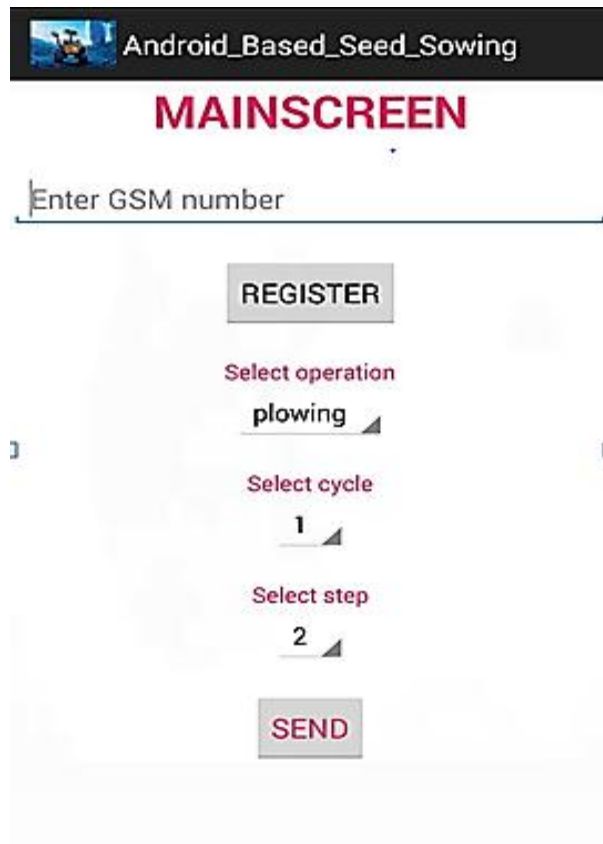
**Figure 10: login screen**

When the user initially opens android application the login page will be displayed as shown in above figure. If new customer wants to use application first the customer has to register by selecting the new user button as shown. Before registration customer cannot login into the android app.



**Figure 11: Registration screen**

As shown in above figure, this is the registration form where the farmer has to register the details before login. The details given to register the username and password have to be used in login page to login into main screen.



**Figure 12:Main screen**

As shown in above figure main screen is used to give input to the robotic machine. By selecting the operations like plowing, seeding, and grass cutting and we can give cycles and steps as input to the robotic machine.

### VII. APPLICATION

This machine is very useful in garden and stadium to cut the grass easily.

This machine is used to perform 3 operations, like plowing, seeding, grass cutting by receiving the input through android application.

This robot is used to plow the land easily without using heavy equipment and animals.

The seeding is done by the flexible and distributed pipe, which reduces wastage of seeds.

Pros and Cons

#### Pros:

The operation of this machine is very simple even to the lay man.

Labor problem can be reduced.

Wastage of seed is less.

The existing System will be removed successfully in this automatic machine.

#### Cons

Sometimes we may find a network problem..

Initial investment is more.

### IX. FUTURE SCOPE

In future, this paper can be taken to the product level. To make this model as user friendly and durable, we need to make it compact and cost effective.

Due to the climate fluctuation when suddenly rain comes we can use the air bags to protect the machine easily without causing to that machine.

### X. CONCLUSION

In the agriculture field the robotic machine is very helpful for the farmers. In order to perform the operations like plowing, seeding and grass cutting this machine can be easily adopted, flexible and can be operated by common man. It can be successfully implemented in 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.

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### 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 (IJAEM), Volume3, Issue6, June 2014 R. Caves, Multinational Enterprise and Economic Analysis, Cambridge University Press, Cambridge, 1982. (Book style).

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[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 Yadav<sup>1</sup>, Pranav Pandhare<sup>2</sup>, Saleel Kulkarni<sup>3</sup>, Shubham Kale<sup>4</sup>, Soniya Zope<sup>5</sup> Design and implementation of Smart Agriculture using Embedded System International Journal Of Engineering And Computer 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.

