

AUTOMATED SEED SOWING MACHINE USING EMBEDDED SYSTEM

Prof. P.M. Bagul & Kalyani Ravindra Patil & Anjali Raju Gore & Shraddha Rajvilas Sapate

Department of Electronics and Telecommunication Engineering, Modern Education Society's
College Of Engineering Pune,India.

Received: February 02, 2019

Accepted: March 13, 2019

ABSTRACT: *As the world is moving towards the modernization in each and every field, the agriculture field is also changing with a rapid growth. New technique keeps on implementing for agriculture to increase the overall crop productivity without affecting the soil texture. The seed sowing machine is a key component of agriculture and it can be achieved by using an appropriate use of small, portable and advanced technology. The proposed work is about development of a machine to minimize the working cost and time for digging as well as to operate it on clean energy. Here, Arduino is used for automation purpose so that the capability of handling multiple tasks at a time can be done softly. Program for various types of seed will be available with this system. User sets the instructions through the android application and as per that it will set the speed to the type of seed provided. This will save time, will improve accuracy and will avoid wastage of seed.*

Key Words: *Arduino UNO R3, Bluetooth, Android Application, Obstacle Detection.*

I. INTRODUCTION

Automation is a necessity in industries because it not only seeks to improve the quality of life for humans at both home and work, it allows the distribution of both quality products and services to be made available at faster rates, and reduces down time and human error. this proposed framework is to decrease seed manor time and increment the efficiency. Thinking about a case of plant nursery, the time required is more for manor which is because of the seed bolstering process as seed nourishing is a talented activity. Pretty much every seed has the ability of developing so can't bolster at least two seeds in a single measure of plate; henceforth causes loss of estates. The proposed work aims at minimizing the human efforts in plantation and to be done precisely. The mechanism is quite simple consisting of digging, feeding and covering -up. The objective of this is to maintain some amount of distance between two seed at the time of sowing process. To enable the machine for the sowing of several of seed like maize, jowar, wheat, etc., and most important is the effectiveness use for automatic seed sowing with great efficiency and accuracy.

II. LITERATURE SURVEY

Ramesh D et al. [1] presents, audit that gives brief data about the different sorts of developments done in seed sowing hardware. The fundamental aim of this activity is to place the seed and compost in lines at wanted profundity and seed to seed separating, spreading of seeds with soil and give legitimate compaction over the seed. In this

multipurpose system gear comprises of tube-shaped shape compartment. in that compartment we can fill the seeds. The holder is connected on the bearers which has four wheels. This system comprises of measuring plate slant gear component and gaps on base contingent upon seed estimate. This filling in as plate will turn in holder when the base openings at compartment and measuring plate gap correspond seed will course with the help of pipe in to the soil. Here with the help of slant gear the measuring plate gets turning movement get together and the slant gears get the movement by back wheels with the assistance chain and sprocket gathering.

Shriprasad B et al. [2] presented data about present day globalization; numerous advances are to refresh another improvement dependent on computerization which works in all respects inflexibly, high successfully and inside brief timespan. The dynamic innovation in agrarian framework is turning into a vital errand particular as a result of rising interest on nature of horticulture items and declining work accessibility in rustic cultivating territories. The planned framework is seeding and treating farming robot utilizing small scale controller. The point of planned framework is to treat the seed and ph of soil, temp. dampness, and to check the sickness. This robot is constrained by remote. This route of robot is controlled by remote. this framework is associated to the web. Direct current engines are utilized for route of the robot. The controller is used to controlled direct current engine. preparing of seeds is controlled by

solenoid. The work gives thought regarding mechanization, utilization of engine.

Kannan D. [3] presented plan adjustment in multiple purpose seed machine. In the work they represented that import the hardware in which mass is having more expense. To keep the structure multiple purpose seed-sowing machine which comprise of container, seed measuring instrument, ground wheel, control framework to transmit, seed-wholesaler. This configuration demonstrates on programming. As a matter of fact, the work is straightforward as the tiller pivots it specifically transfer the movement to ground-wheel which straightforwardly associated through fundamental shaft. A primary shaft has a plate in the container.

khanna, A;Ranjan, [4] presented, The Agri-bot created in the work performs burrowing, seed sowing and to cover seed. all the while and controlled by sun-based board. It uses Android App.

Amer,G;Mudassir, S.M.M;Malik, M.A. [5] presented each development is observed on the server of web just as on Android-App from anyplace.in future this work can be extended isn't just identifying obstruction yet additionally keeping away from it effectively without irritating the fundamental course of the framework.

III.DESRIPTION OF BLOCK DIAGRAM

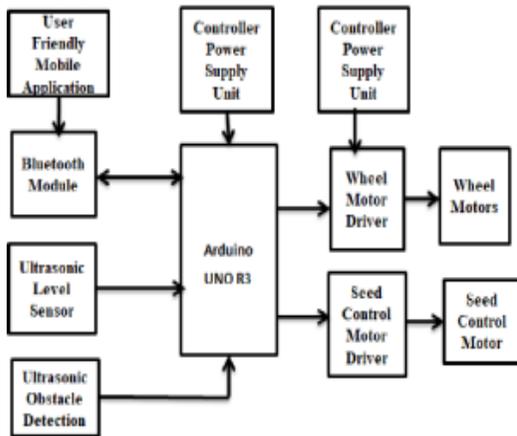


Fig. 1 Block Diagram of seed sowing machine

i) Arduino UNO R3 Board:

As appeared in fig.1 Arduino UNO R3 is the core of framework which is associated with every one of the sensors and other equipment get together required to accomplish the craving work. Arduino UNO R3 is a little, total, and breadboard. cordialArduino board dependent on the ATmega328. The ATmega328 has 32KB of blaze

memory for putting away code in which 2KB is for bootloader. The ATmega328 has 2KB of SRAM and 1KB of E^2PROM. The controller has minimal effort and effectively accessible.

ii) Ultrasonic Sensor:

A ultrasonic sensor fundamentally measures the separation to an item utilizing ultrasonic sound waves. A ultrasonic sensor utilizes a transducer to send and get ultrasonic heartbeats. High-recurrence sound waves reflect from limits to deliver particular reverberation designs. Also, is being utilized to continue observing the seed level.

iii) To Detect Barrier:

The essential errand of Agri-bot is to Detect Barrier. The range of this sensor is 2cm to 400cm. to identify snag 3mm precision is required. The system incorporates transmitters, recipient and controlling circuit. The fundamental standard is that, if the flag gets returned through abnormal state time term, test separation can be determined as appeared in condition (1)

$$\text{Time Distance} = \text{sound velocity} * \text{time of high level} \dots (1)$$

2

iv) Seed Level measurement:

It will continue observing that how much amount is available inside the compartment. Seed Level can be determined as appeared in condition (2)

$$\text{Level detect} = \text{distance} * 0.034 / 2 \dots (2)$$

v) DC Motor:

It's a class of turning electrical machines changing over electrical machines that changes over direct flow electrical vitality into mechanical vitality. As terminal voltage increments or diminishes, the speed of the associated/dc engine additionally expanded or diminishes. The working of DC engine has been delineated in Table-I. In table-I L indicates low and H indicates high.

Pattern	Input A	Input B
Stop	L	L
Clock-wise	L	H
Anti-clockwise	H	L
Stop	H	H

TABLE I. Pattern of DC Motor

vi) DC-Motor Driver:

A Direct Current engine is an electro-mechanical gadget changing over electric vitality which is

utilized to perform development of Agri-bot suspension with the assistance of L293D-IC.as control required to run the engines through Arduino isn't sufficient, L293D-IC can discover the ebb and flow rating issues. Agri-bot requires 30-rpm engines so speed is given by it will withstand the total load of entire get together.

vii) Mechanism for seed sowing:

For the use of seed sowing, DC engine is used. This is only a straightforward engine, controlled by DC component. We can turn the DC engine with required degree that is appended in container which contains seed. The component of this mechanism is accomplished effectively.

viii) Mobile Application:

Android Application is created by utilizing MIT App Inventor. It is a Kind of application which gives similarity with every single small-scale controller. All required is a HC-05 sequential connector association with sequential ports of the controllers. It can control any controller that utilizes a Bluetooth Module HC 05 or HC 06 through your advanced mobile phone. This application can send and get order.



Fig. 3 Android Application for Agrirobot

I) Bluetooth Module:

Utilization of Bluetooth SPP module is simple using HC-05. It is used for sequential remote setup. The sequential correspondence is used because of which interfacing with computer is simpler. The Bluetooth module HC-05 gives exchanging mode. The stick portrayal of Bluetooth module is as appeared TableII.

Pins	Pin Description	Functions of pins
VCC	+5V	Connection to +5V
GND	Ground	Connection to Ground
TXD	UART, Transmitter, Bluetooth serial signal sending PIN	Connect with the Receiver pin of Arduino.

RXD	UART, Receiver, Bluetooth signal sending PIN	Connect with the Transmitter pin of Arduino.
-----	--	--

Table II pin description of Bluetooth module

IV.WORKING PRINCIPLE

Input given by the user, Arduino will provide command to the plate to select an appropriate seed sowing and the speed will be set accordingly. Ultrasonic sensors are connected to the analog pins of an Arduino. Reason behind using ultrasonic sensors is to detect any obstacle present and to keep on monitoring the seed level. If any obstacle detected, the machine will stop automatically and the machine will respond as per the further command given user that in which direction the machine should move. Then again, it will start its operation of sowing. The working principle of proposed system as shown in fig.4. First it will dig up soil by maintaining distance to feed seed in soil.

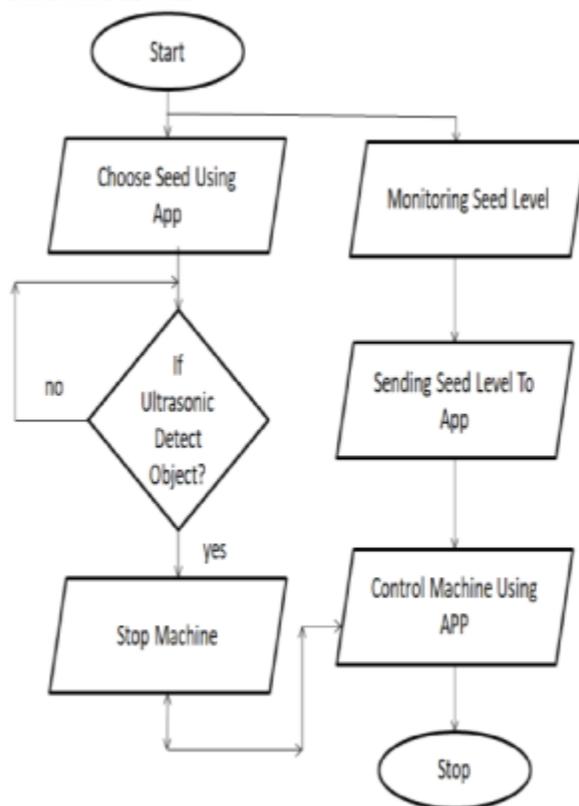


Fig.4 Flow chart of execution

After feeding it will move further so as to cover the seed by soil. This process will be continued till the stop command is not provided by the user through the android application. Suppose the user wants to change the seed we just to give input to system through application it will automatically change the speed of plate then the plate installed

below hopper will move according the type of seed instructed by the controller. Agri-bot is controlled by android App. Fig. 4 represents picture of android App. The Bluetooth device is very much needed as to send the command for performing operations. The device is HC 05. The transmitter side of this is connected to the receiver side of the Arduino and the receiver side of this is connected to the transmitted side of Arduino. The Android Application is connected through the Bluetooth terminal app.

V.RESULT

In the wake of thinking about colossal favorable circumstances of the machine, it is presumed that mechanized vehicle for ranchers can keep up line dividing, appropriate use of paces should be possible with less misfortune. Performing different concurrent activities. This Automated seed sowing machine can possibly expand efficiency. The proposed framework gives a minimized, ease and low power framework with a proficient yield.

Table III Result

Placing seeds by Agri-bot	From Land	Grassy Land	Hard Surface
Soy-bean (4.9 to 5.6 cm)	5 cm	4.8 cm	5 cm
Jowar (9.7 to 12.2 cm)	9 cm	10 cm	9.5 cm
Wheat (7.8 to 10.2 cm)	9 cm	8 cm	8.7 cm
Pulses (6.5 to 8.3 cm)	7.3 cm	7.9 cm	6.7 cm



Fig. 5 Agri-bot view

VI.CONCLUSION

It is presumed that, mechanized mechanical autonomy vehicle for ranchers can keep up column separating and appropriate use of speed should be possible with less misfortune.

REFERENCES

- [1] D. Ramesh, H.P. Girishkumar, "Horticulture Seed Sowing Equipment's: A Review", ISSN NO.:2278-7798, Volume3, JULY 2014.
- [2] B. Shivprasad, M. Ravishankara, B. Shoba., "Structure and Implementation of Seeding and Fertilizing Agriculture Robot", Volume 1(3)190-213, 2010.
- [3] A. Kannan, K. Esakkiraja, S. Thimmarayan, "Plan and Modification of Multipurpose Sowing Machine" VOL:2, ISSN (ONLINE): 2321-3051, JAN 2014.
- [4] Khanna,A;Ranjan, "Sun oriented controlled Android based Speed Control of DC engines through Secure Bluetooth," Communication frameworks and system advances CSNT worldwide gathering (IEEE Publication), pp 1244-1249, 2015.
- [5] Amer, G;Mudassir, S.M.M; Malik,M.A., "Plan and task of Wi-Fi Agrirobot Integrated framework ", Industrial Instrumentation and Control, Worldwide Conference (IEEE Pubslication), pp 207212, 2015.