

“Automatic Mechanical Embedded based Remote Controlled Seed Sowing System for Agriculture.”

Mounika CH¹, M.Ganesh Kumar², Mekala Navya³, monika B.0⁴, Vinay s.v⁵, Nataraj Urs H D⁶

^{1,2,3,4}B-TECH 3rd year, School of Electronics and Communication Engineering, REVA University, Bangalore-64.

⁶Professor, School of Electronics and Communication, REVA University, Bangalore-64

Abstract

The foundation of the Indian economy is agribusiness. Of the all-out populace in our nation which has picked farming as their central occupation is over 60% as indicated by FAO (Food and Agriculture Organization). Sowing arable land with traditional farming methods are clumsy ways, as it produces less yield, so automation is required in the field of cultivation. The seed sowing robot is intended to limit the work of ranchers, for example, furrowing the arable land, and spreading the seed. The robot is self-sufficient and is remote controlled. The undertaking comprises of a superior structure of a machine for spreading groundnut, soya bean, Bengal gram, maize and so forth. This paper is for the most part worried about the computerization of an incomplete procedure engaged with the horticulture utilizing programmed robot framework for developing the land.

Keyword: - FAO, ATMEGA328p, LM 293D, HC-05, SDU (speed dispense unit).

1. INTRODUCTION

Agribusiness assumes a significant job in India's economy. The requirement for computerization in the field of the horticultural part is mostly because of the expanded requirement for farming items because of expanding populace and deficiency of work in the rural area. This paper is for the most part worried about the robotization of a fractional procedure associated with horticulture. The conventional techniques for seed sowing incorporate telecom, putting seeds behind the furrow, line sowing, transplanting, spilling and so on. The utilization of a tractor is most basic in the current farming pattern, before the seeding procedure is done. It is important to initially blend the top layer of the soil with the fertile base layer of the soil which is normally done by the tractors or creature is driven furrow, and furthermore for sowing the seeds i.e. digging the hole ploughing the land, covering the seed with soil with manual metering of seeds are very prevalent. Since it requires more investment, so robotization is required to the ranchers.

The shown strategy for seeding is the manual one, yet it requires additional time and labour lack is confronted constantly. India is agrarian financial aspects and the greater part of the country populaces rely upon farming to gain their job. Farming is the biggest occupation given in India generally in provincial regions. The ranchers need seeds for furrowing and development. The seeds are accessible in bundles and numerous enterprises bargain in the assembling of such seeds parcels, Therefore computerization is required. In this paper, the robot framework is utilized to build up the way toward developing the area to lessen labour and increment the efficiency rate.

2. METHODOLOGY:

In this project, it is showing the development of an agricultural process which is independent agribusiness framework. The main strategy of the robot is Bluetooth and a motor driver. The square chart of the mechanical framework in independent agribusiness framework has appeared in figure 1. The framework incorporates Bluetooth, two motors and entire parts are constrained by a microcontroller. The core of the framework is the microcontroller ATMEGA328p. The controller we are utilized in this task is Arduino ATMEGA_UNO controlled at the range of 5 to 12v for a minimum of 250mA current output.

2.1 BLOCK DIAGRAM

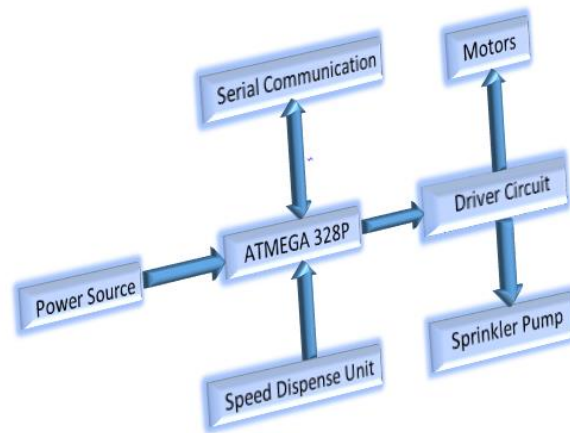


FIG1:- Block diagram

The main priority of our project is ATMEGA 328p where all control blocks are controlled by Arduino i.e. serial communication (BLUETOOTH), motor driver, DC geared-motors. Serial communication has been done at a board-rate of 9600 where the power supply has been connected to both Arduino and driver circuit according to its requirement.

We incorporated with the special unit called as speed dispense unit where it acts as volume controller for seed spiller and also it gives Data to the Arduino so, Arduino can able to adjust the time duration of seed sowing by passing pulse to the driver circuit. Here we are using a sprinkler pump where it is used for the sprinkling of different pesticides and water for the agricultural land.

2.1.1 AURDINO_UNO



FIG2:- Arduino Uno board

Arduino Uno is a developer circuit board. It consists of 14 digital input and output ports and 6 are analog sources input ports with a crystal oscillator of 16 Megahertz. ATMEGA 328p_Integrated chip is the chief component in the Arduino board. Arduino is one of the easiest programmable controller circuit board operated at 5 to 12 volts range. Serial communication is performed by receiver and transmitter that is port number one and zero respectively, it is controlled by 8 bits of ATMEL series and also it has a built-in power regulator for controlled power supply to the microcontroller chip and it can able to withstand the load of 500miliamperes, it has type B universal serial bus connection for dumping the code of respective operations that has to be performed also it is connected from pc to the USB socket and it is an open source software which can able to work with embedded C program.

2.1.2 LM 293D

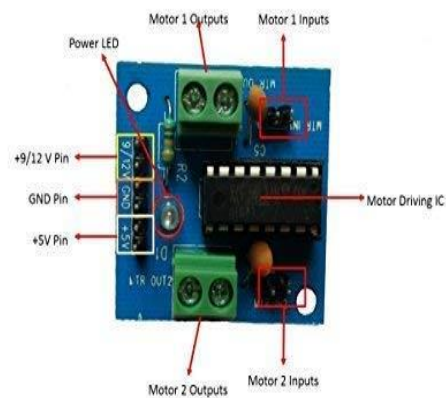


FIG3:-LM 293D

The L293D is for the most part of driver integrated chip containing circuit concept of H-bridge. By using a pulse width modulation circuit thereby increases the chip space. By interfacing dual dc engine to the driver IC L293D we can move MOTOR toward both paths. Table 1 shows the functionality to be performed. The precisely controlled speed of a Dc _motor is relying upon the voltage, and the force of momentum has relied on the current. Velocity control is achieved by alterable voltage supply, electronic components or electronic controls be the framework to microcontroller chip for shifting the velocity by interpolating the pulse timing of PWM passing between controllers to motor drivers.

2.1.3 DC motor

The prototype framework uses dc geared motor to accomplish greater torque. The driving velocity of designed agri-bot is controlled by altering the velocity of dc geared-motor just as by controlling the direction of rotation of every DC motor, the framework was designed in such a way that always updates the course of wheels. DC driver and geared- motor needs 530mA current for both at a time to get function. This framework utilized L239D which provides 500-600mA o/p current. The current sources of microcontroller port o/p are approximately 60uA and also the rate of flow of charges required for driver feed line draws up to 100uA each, So to give adequate current for each data line of the L239D framework utilizes amplifying register of 2.2K which feeds 2.2milliAmpere current.

2.1.4 BLUETOOTH HC 05

Bluetooth(HC-05) is a familiar component that is used in serial communication and it can be used as master as well as slave in serial communication example:- suppose if the android device is paired with Bluetooth module then smartphones Bluetooth becomes master and HC-05 Bluetooth module becomes slave, i.e. whatever the command send serially by the master the slave decodes and send the data to Atmega 328p integrated chip through receiver port respectively.it is observed that while dumping the code to the Arduino board at that particular time receiver and transmitter ports. The same ports have to be removed because these ports are used in serial communication between pc and Arduino Uno board. The (IEEE) recognized the IEEE 802.15 standard. Its primary quality is its capacity to at the same time handle the two information and voice transmissions

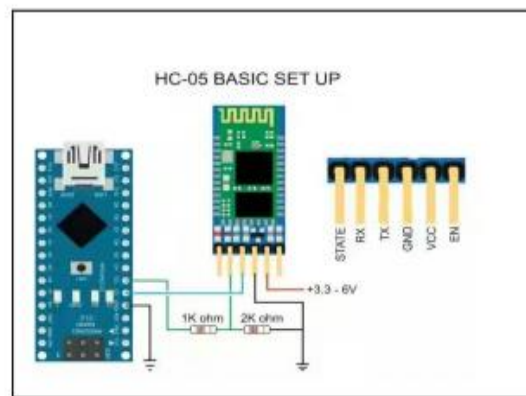


FIG4:- Bluetooth device

Favorable circumstances: Of Bluetooth device

1. Simple of utilization.
2. No LOS (Line of sight) required for information exchange.
3. Less power utilization makes its use exceptionally reasonable.
4. 2.4 GHz radio frequency guarantees overall operability.
5. The information rate is high for example around 3Mbps.

2.2 SCHEMATIC

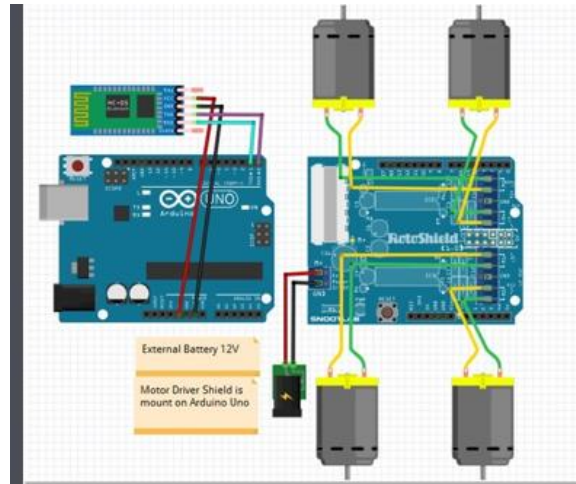


FIG5:-SCHEMATIC

The lm-293d controls the speed of the motor, by altering the pulse passing from controller circuit to motor driver and in order to avoid from obstacles the HC-05 is used through wireless serial communication which is controlled by ranchers through android application.

3. RESULT:

Type of seed: - wheat

The capacity of the hopper to carry wheat is 2.5kg.

Sr. No	Distance Travelled (m)	Time (sec)	Distance between adjacent seed (inches)
1	01	5	1 to 2
2	02	9	1to 2
3	03	12	1 to 2
4	04	15	1 to 2
5	05	18	1 to 2
6	06	21	1 to 2
7	07	24	1 to 2
8	08	28	1 to 2

Type of Seed:-Gram

The capacity of the hopper to carry gram is 1.5kg

Sr. No.	Distance Travelled (m)	Time (sec)	Distance between adjacent seed (inches)
1.	01	3	5 to 6
2.	02	20	5 to 6
3.	03	30	5 to 6
4.	04	35	5 to 6
5.	05	39	5 to 6
6.	06	44	5 to 6
7.	07	47	5 to 6
8.	08	55	5 to 6
9.	09	59	5 to 6
10	10	64	5 to 6

Table2

Since, subsequent to taking the total perception of two distinct kinds of seed we get the higher yielding as contrast with ordinary seed sowing machine.3.1

3.1 ADVANTAGES

1. These machines are enough structured with Auto seed sustaining framework planting Channel for ideal developing condition
2. Adjustable seeding rate of seeds.
3. No additional ranchers are required.
4. It is conservative in seed size ploughing process.

3.2 DISADVANTAGES

1. At the point when the seed is little in size, we need manual exertion for the setting.
2. It is worked on battery supply if any failures happen the entire framework not work legitimately.

4. CONCLUSION

The principal focal point of this framework is its Automatic method for sowing the seeds has a remarkable influence in agriculture and less time period requires for ploughing process and it is affordable to farmers in terms of price and yield. Seeds are sowed in an efficient way such that uniformly plough the top layer of the arable land in a uniform manner, thereby we conclude ‘Automatic mechanical embedded based remote controlled seed sowing robot’ it is required in cultural cultivation of crops.

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