# Smart Agro Machine : A Review

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**ABSTRACT**

*In this era of industrialization, them automation world is shrinking the need of humans to assist machinery.Looking at the present scenario asmart agriculture machine which uses Arduino for the command and IC Motor drive for functioning of different motors required to perform various operations in field.Traditional methods of agricultural practices involved enormous amount of labor effort and were not even that effective in order to overcome this short come this project presents a model which performs various agricultural operations. Bluetooth module is used as the controller to control the automatic functioning of this machine with the help of smart phone or any smart device or receiver. DC Battery is used to successfully run the dc motors and provide power to various other components. The successful implementation of Arduino does the function transmitting signals when required. Thus, this project marks an effective and accurate process of smart agricultural machining.*

**Keywords:** *Microcontroller, DC Motor, Bluetooth Module, IC Motor Drive, DC battery.*

## 1. INTRODUCTION

Agriculture has been the backbone of the Indian economy and it will continue to remain so for a long time. It has to support almost 17 per cent of world population from 2.3 per cent of world geographical area and 4.2 per cent of world's water resources. In today's agriculture there's a need for sophisticated technologies that uses sensors and microcontroller, GPS technology to reduce the human effort and provide farmers that extra profit which he deserves. Automation is the use of control systems and information technologies to reduce the need for human work. In the scope of industrialization automation is a step beyond mechanization. Automation greatly decreases the need for human and metal requirements as well. Automation plays an increasingly important role in the world economy. One of the important applications of automation is in the agriculture where the farmer can do entire field work by just some clicks on his phone. For these kinds of application the trend is switching from the individual device or machine toward continuous automation solutions. The aim of this project is to design a microcontroller based automatic farming machine which does various purposes such as ploughing, seed sowing, crop cutting and harvesting. In this project we have feeded arduino with commands which will be operated by smart phone the Bluetooth module receives signals from smart device and then the signals are passed in from Arduino which according to feeded command generates new message accordingly for IC L298 motor drive and different functions are performed.

## PREVIOUS WORK

The purpose of Smart Agro Machine is to fulfil all the main functions performed by a farmer.It involves watering , seed sowing , harvesting, ploughing.Machines have been built which perform monotonous function but no machine has ever been built that can perform all these functions simultaneously ,placed in a machine.Its working is very simple , its connected with Arduino and Bluetooth module which is connected to smart phones having Bluetooth device and module HC-05 is connected with Bluetooth and functions are performed in the way coding is done in Arduino based on C language .

**Objective**

The project is aimed to meet the following objectives:

-To design and implement automated agriculture machine.
-To help farmers reduce their labor effort.
-To learn microcontroller programming.
-To learn the concepts related to DC Motor and Automation.
-To build various agricultural devices on a single vehicle.

**Working**

**MOTORS**

Different motors of different capacity have been employed in the movement of various parts.The purpose of these motors is to provide the actual motion the vehicle as well as provide motion to the mechanisms connected with it.

| Purpose | Capacity(in watt) | Quantity | Speed(rpm) |
|---|---|---|---|
| Vehicle movement | 30 | 2 | 100 |
| Ploughing | 24 | 1 | 75 |
| Harvesting | 12 | 1 | 200 |
| Seed Sowing | 12 | 1 | 50 |
| | | | |

**DC PUMP**

A DC Pump has been setup in the mechanism to provide Watering system which is connected to the tank kept on the vehicle as a water reservoir.The pump relesses water through the tank whenever it is feeded with the command.The watering system is most important activity in farming and this pump can also be connected with water source provided outside the vehicle.

**ARDUINO**

Arduino is a micro-controller device used for performing different electronic activities.The Aruino can interact with the internet , smart phones , laptops or even TV .The Arduino software is easily available on the internet and is very easy in operation.The Arduino used in the project is Arduino UNO which is a basic form of

Arduino.The coding is feeded in C language which is basically controlling of motors on the command given by the user with the help of their smartphones.
Arduino is connected with L298 motor drive which is connected with motors.

Coding :

```
void setup()
 {
  // put your setup code here, to run once:
  pinMode(5,OUTPUT);  //Motor1
  pinMode(6,OUTPUT);

  pinMode(3,OUTPUT);  //Motor2
  pinMode(4,OUTPUT);

  pinMode(10,OUTPUT);  //Motor3
  pinMode(8,OUTPUT);

  pinMode(9,OUTPUT);  //Motor4
  pinMode(7,OUTPUT);

  pinMode(11,OUTPUT);  //Motor5
  pinMode(12,OUTPUT);

  Serial.begin(9600);
 //Begin Serial Communication

}

void loop() {
  // put your main code here, to run repeatedly:
  char c;
  if(Serial.available())
  {
    if(c== '0')
    {
      analogWrite(5, 90);   //Motor1 ON, to change the speed change the value 90 (range is 0-255)
      digitalWrite(6, LOW);
    }
    else if(c=='1')
    {
      analogWrite(5, 0);   //Motor1 OFF
      digitalWrite(6, LOW);
    }
    else if(c=='2')
    {
      analogWrite(3, 150);   //Motor2 ON
      digitalWrite(4, LOW);
    }
    else if(c=='3')
    {
      analogWrite(3, 0);   //Motor2 OFF
      digitalWrite(4, LOW);
    }
    else if(c=='4')
    {
      analogWrite(10, 150);   //Motor3 ON
      digitalWrite(8, LOW);
    }
```

```
   else if(c=='5')
   {
    analogWrite(10, 0);   //Motor3 OFF
    digitalWrite(8, LOW);
   }
   else if(c=='6')
   {
    analogWrite(9, 150);   //Motor4 ON
    digitalWrite(7, LOW);
   }
  else if(c=='7')
   {
    analogWrite(9, 0);   //Motor4 OFF
    digitalWrite(7, LOW);
   }
   else if(c=='8')
   {
    analogWrite(11, 150);   //Motor5 ON
    digitalWrite(12, LOW);
   }
   else if(c=='9')
   {
    analogWrite(11, 0);   //Motor5 OFF
    digitalWrite(12, LOW);
   }

  }

}
```

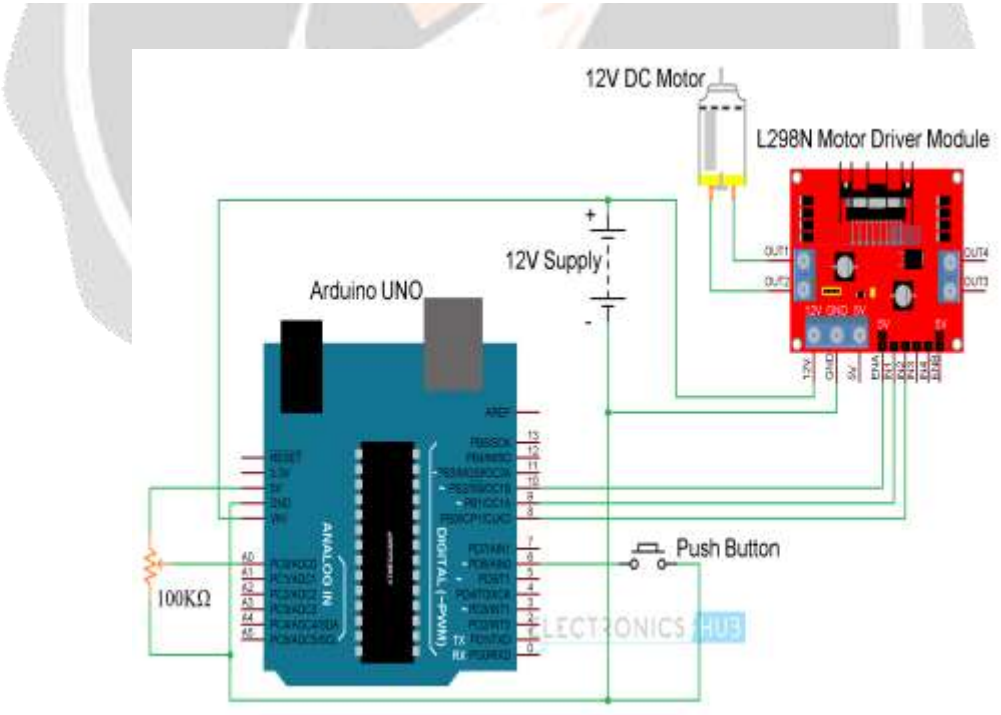


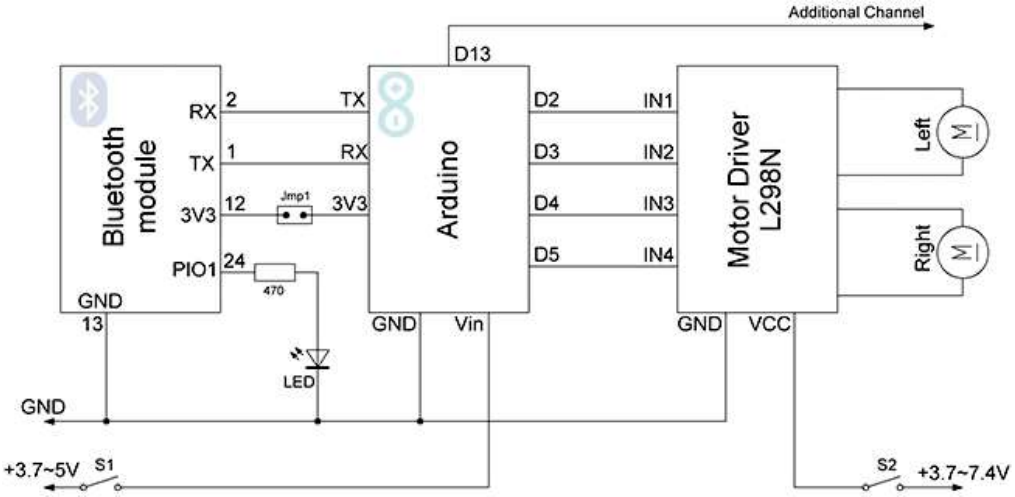

Fig 3.3 Arduino connected with IC Motor drive

**Bluetooth Module**

A Bluetooth Module has been used in the project to transmit and receive commands from the farmers via smartphone.HC-05 module has been used it is the one of the advanced Bluetooth technology that transfers data at a really high or moderate rate.

It is a hardware component that provides connectivity to different devices wirelessly.

It has four pins two are for transmission and receiving and other two are for ground and 5 V connection.

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