A

PROJECT REPORT

ON

"Remote Control Irrigation Machine"

Submitted by

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F.Y. B Tech

UNDER THE GUIDANCE OF

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Semester-1

CERTIFICATE

This is to certify that, the Project report entitled

“Remote Control Irrigation Machine”

Submitted by

Swapnil Shankarrao Deshmukh

As the partial fulfillment of Engineering Exploration Lab

For the academic year 2020-2021

This project is a record of student’s own work, carried out by them under our supervision and guidance.

Mr. K Murli Mohan **Mrs. Vinaya Kishte** **Ms. Madhuri Baswade**

ACKNOWLEDGEMENT

For teaching and giving knowledge, I firstly thanks to my all teachers of the Engineering Exploration subject, for their very-very great knowledge and suggestion given to us for making for making of my first project report in my life.

It is with a great sense of gratitude that we acknowledge the support, time to time suggestions and highly indebted to our guide.

Finally, I pay my sincere thanks to all those friends who helped me towards the successful completion of this project report.

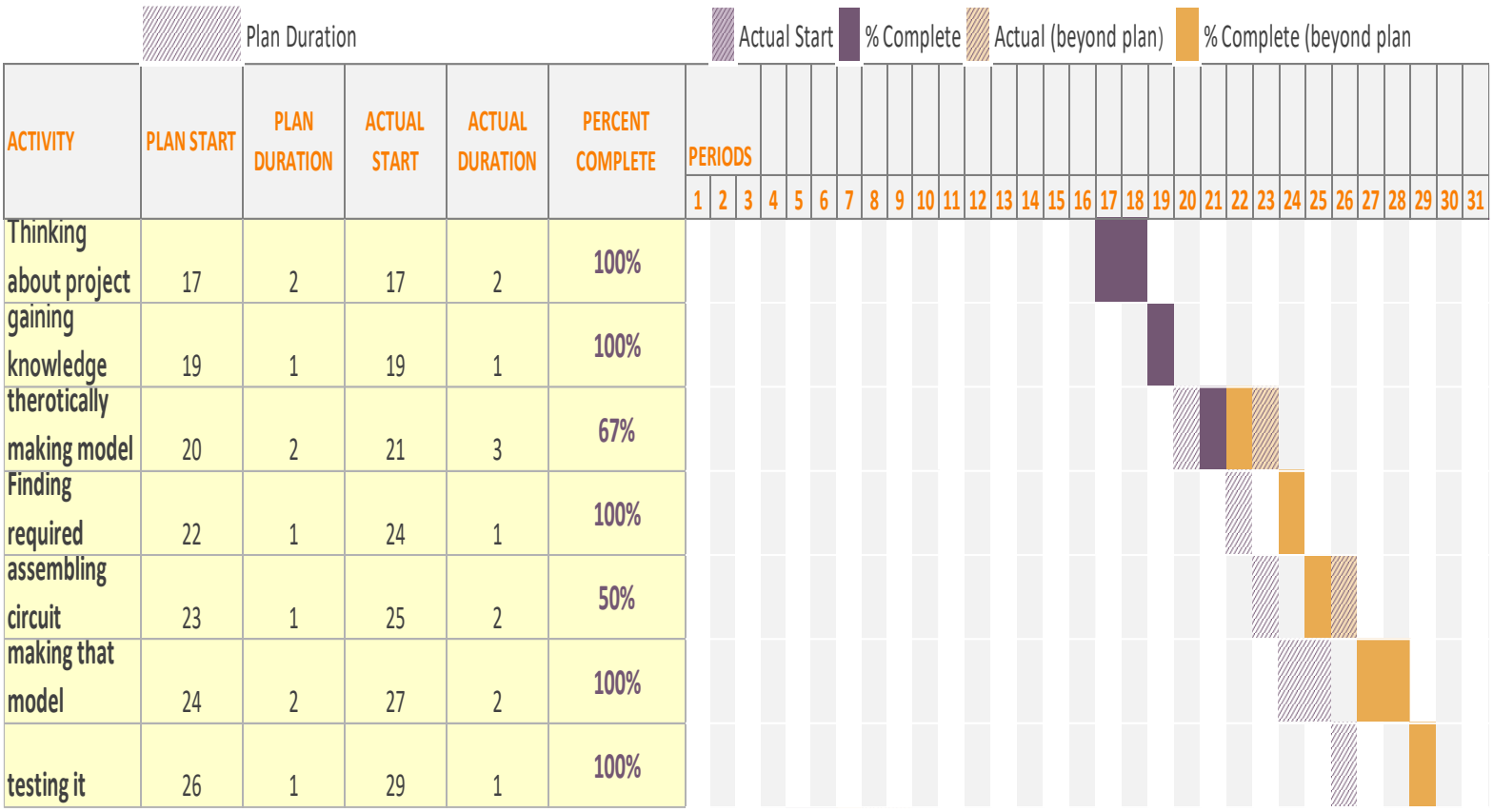
Abstract

Because of busyness of everyday life sometimes we can't give water to trees in the garden where they live. So it required the automatic water supplier to plant

In this report, the working of Remote control irrigation tool is briefly introduced. This machine model build using use of Arduino . The design of machine is very simple and light weight ,so it is easy to use. For better performance we can use the latest model of wireless remote.

The circuit simulation is carried out with the help of tinkercad simulation. 3-D model of design of machine is made in pant 3-D using various toolkit. Further design for making it light can be continued by our team made in future.

Gantt Chart



ACTIVITY	PLAN START	PLAN DURATION	ACTUAL START	ACTUAL DURATION	PERCENT COMPLETE
Thinking about project	17	2	17	2	100%
gaining knowledge	19	1	19	1	100%
therotically making model	20	2	21	3	67%
Finding required	22	1	24	1	100%
assembling circuit	23	1	25	2	50%
making that model	24	2	27	2	100%
testing it	26	1	29	1	100%

PERIODS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

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INTRODUCTION

With the help of circuit components made the remotely controlled model of irrigation given to the garden plants. This project deals with growth and taking care of plants, by giving after planting water in the way that people, most of child will very happy because of the device.

1.1 Objectives of project

Objective of the project is to make the remote-control irrigation system. But it is easy to install, Arduino based circuit and give joy to remote centrally play like video games. It has design like to cover all the area present in garden, by projectile thrown the stream of water at 360-degree direction.

The design of the devise is such that it can solve many problems. It can thus be made to specify the requirements of users. Also, this makes portable, low maintenance design for model. And it also use for other purposes.

1.2 Background of project

In the background of project, it involves coding to the Arduino board so the circuit can be controlled by its own language. The Arduino connected with the IR sensor so that it can be controlled with the help of IR remote. It also involves many types of circuit components. If we send our command to the machine it detected by IR sensor and it send that command to the Arduino, as per code we given to Arduino it sends to the respective part of machine. As this way device works properly in the way we give.

Literature Review

Many of irrigation machines are available in the market, but are not portable in sense of that when

Nowadays, pollution is the main problem of our all world. Because of decrease of number of trees day-to-day life there is increase in number of greenhouse gases, that's why many health problems are in front of our society. So most of people are aware, they came forward and make social awareness about the planting of trees. At this time many trees are planting by peoples. Most of people plant the trees.

But main problem came when they plant trees, but do not take care of it. They busy at their own life. They are bored about that.

PCC and PUGH chart

PCC CHART

	cost	Good in looking	easy to use	electricity consumption	portable	range of water	size	remote control	speed control	Total
cost	#	1	0	0	0	1	0	0	1	3
Good in looking	0	#	0	0	0	0	1	0	0	1
easy to use	1	1	#	1	0	1	1	0	1	6
electricity consumption	1	1	0	#	0	0	1	0	1	4
portable	1	1	1	1	#	1	1	0	1	6
range of water	0	1	0	1	0	#	1	0	1	4
size	1	0	0	0		0	#	0	1	2
remote control	1	1	1	1	1	1	1	#	1	8
speed control	0	1	0	0	0	0	0	0	#	1

From above table we know which type of priority have in that device.

So, making it remote control has our higher priority, then it is easy to use and portable is our next priority. Then it has low electricity consumption and high range of water. Also, it has low cost, smaller size is more comfortable. Last at some extent it can control the speed of water.

As this priority, our device has its own design.

PUGH CHART

Design Criteria	Weight	remote control irrigation	sprinkler irrigation	drip irrigation	canel type irrigation
cost	3	0	+	-	0
Good in looking	1	+	+	0	-
easy to use	6	++	+	0	-
electricity consumption	4	0	+	+	+
portable	6	++	-	-	--
range of water	4	++	+	0	0
size	2	+	+	-	0
remote control	8	++	+	+	+
speed control	1	+	0	0	0

+	52	28	12	12
0	7	1	12	10
-	0	6	11	19
Total	**52**	**22**	**1**	**-7**

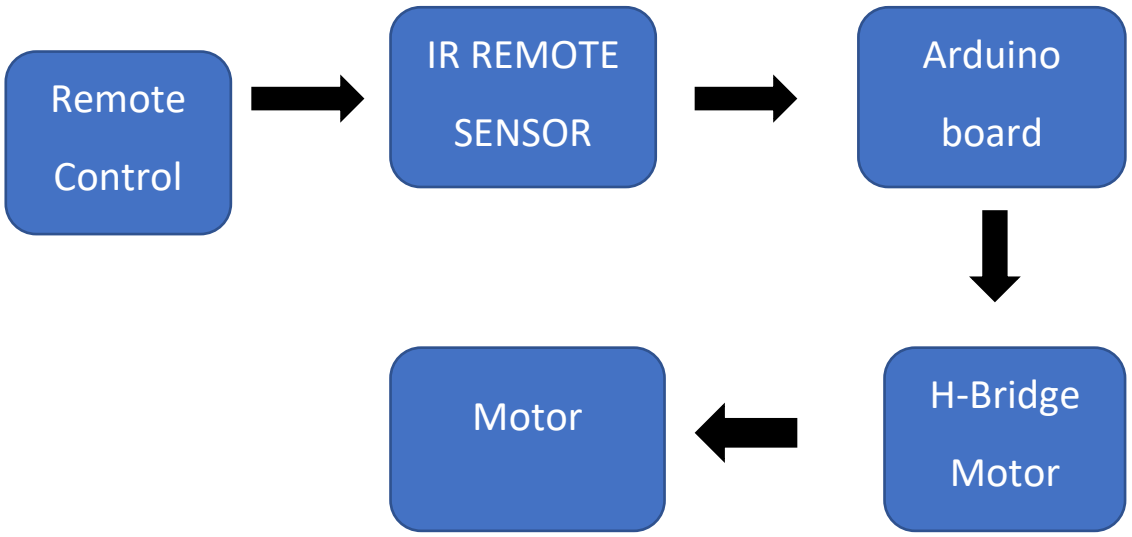
From above table it proved that our design model has more points than any other irrigation system. So, our design model is best in major of this which selected above like from sprinkler, drip, canel irrigation.

Working and Principal

PROJECT DESIGN

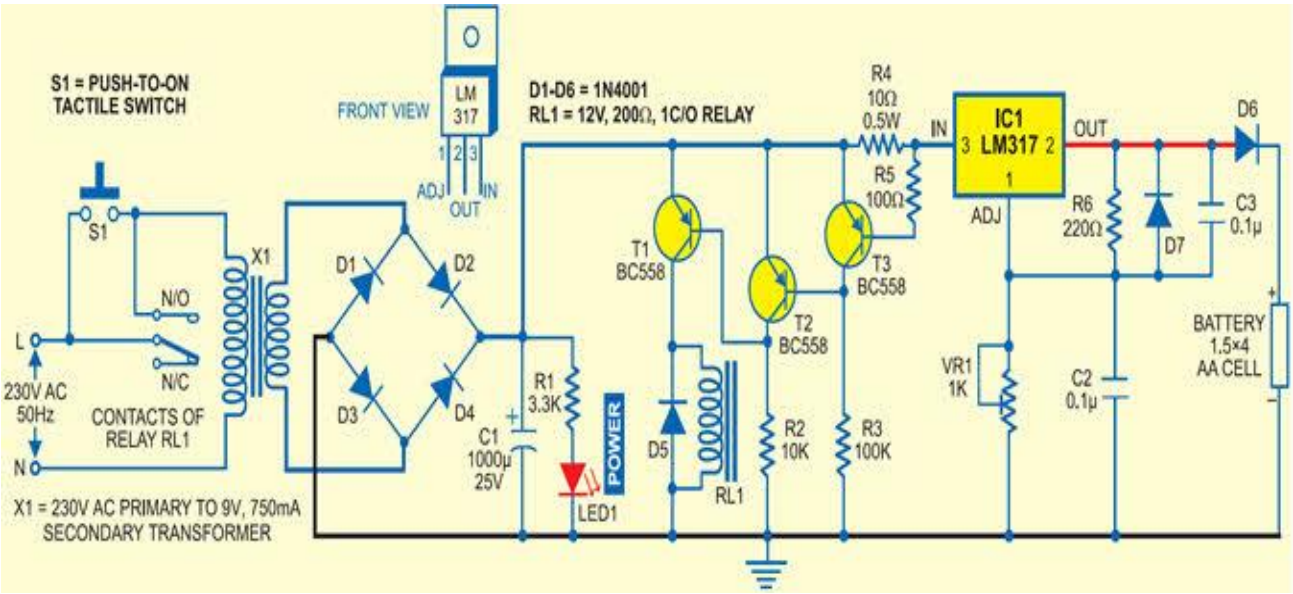
The project design and principal explained in this chapter using circuit diagram and its design. Also, we have discuss the required components of design and working condition is explained using circuit diagram.

Block diagram of the project and its description :



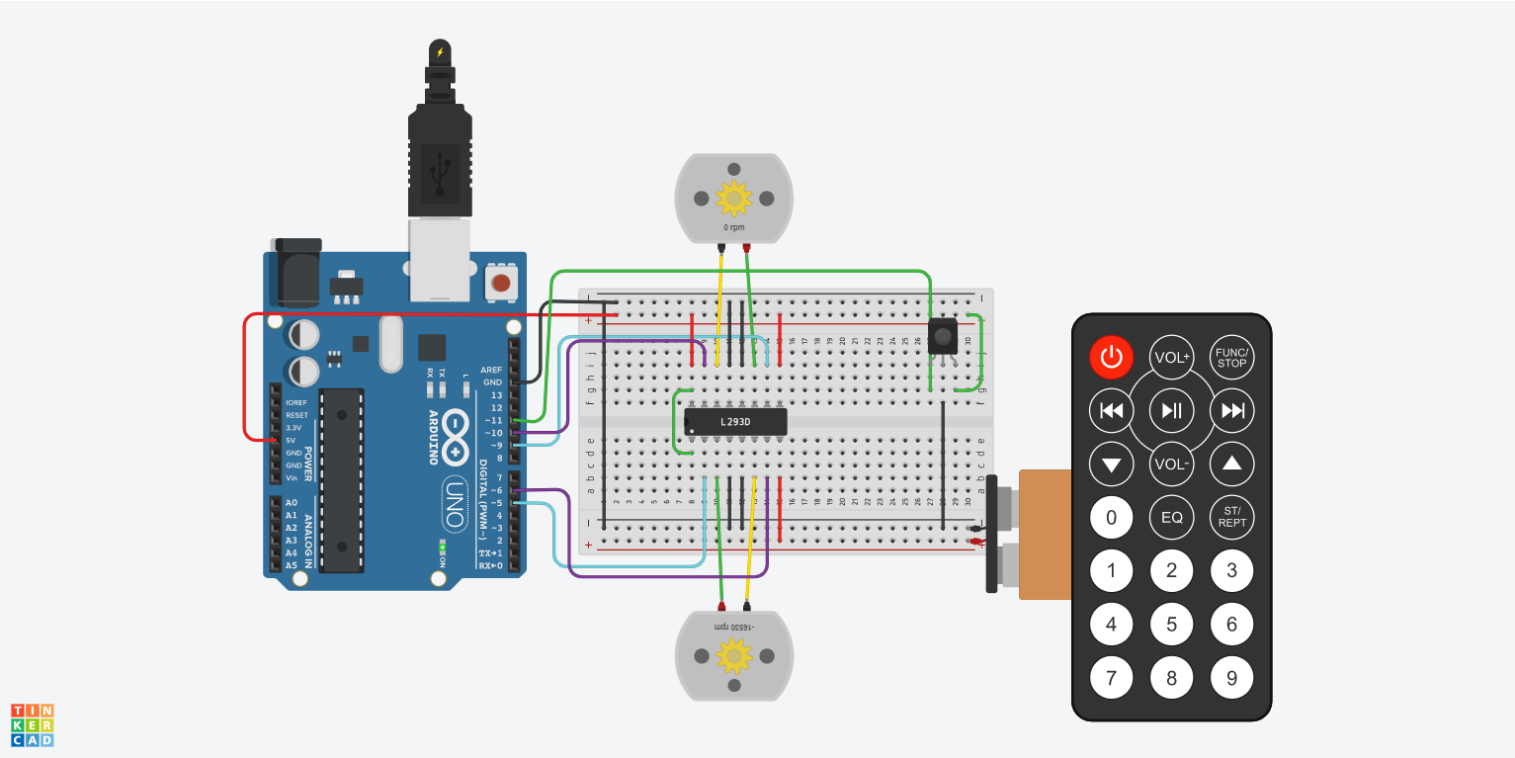
Power supply for battery:

To charge battery we use the think like of mobile charger. The input of the circuit is applied from the regulator power supply. The ac input i.e., 230 v from the main supply is step down by transformer to 12v and fed to rectifier. The output obtained from the rectifier is a pulsating dc voltage. So in order to get pure dc voltage, the Output obtained from rectifier is pulsing dc voltage, the output from voltage rectifier is fed to a filter to remove any ac components present even after rectification. Now this is given to voltage regulator to obtain pure constant dc voltage.



As per above diagram we use the simple charging port of 65 W charging supply.

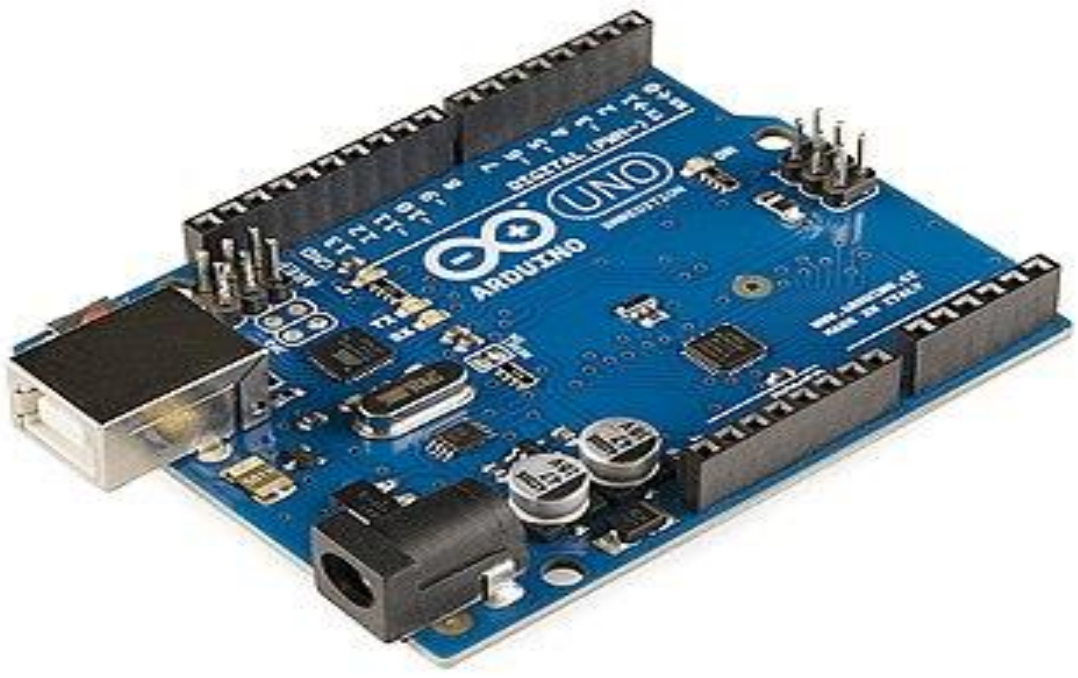
Circuit Diagram:



Components used in the circuit

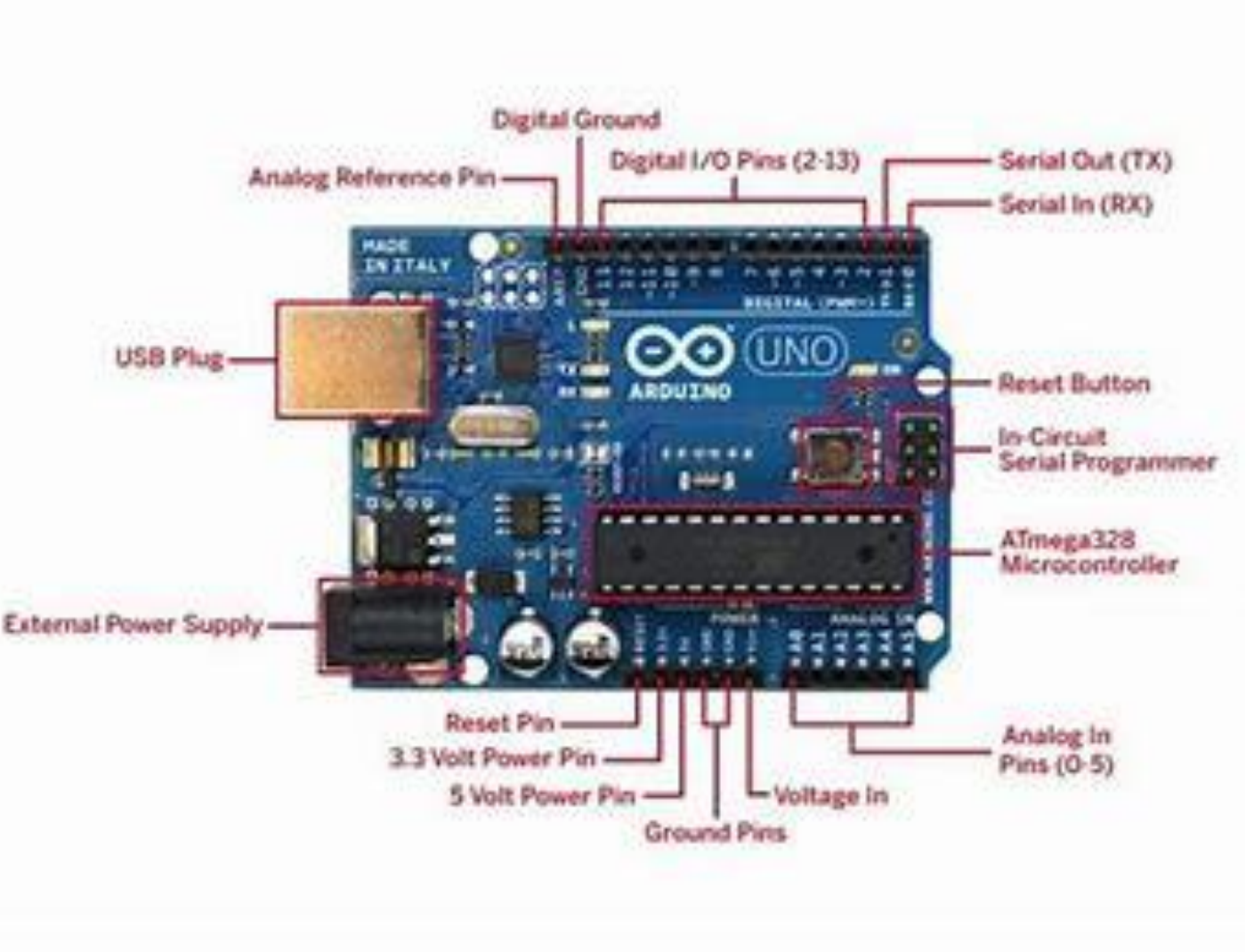
1) Arduino Uno R3:

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. It is similar to the Arduino Nano and Leonard



General pin function:

- **LED**: There is a built-in LED driven by digital pin 13. When the pin is high value, the LED is on, when the pin is low, it is off.
- **VIN**: The input voltage to the Arduino/Genuino board when it is using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.
- **5V**: This pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 20V), the USB connector (5V), or the VIN pin of the board (7-20V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage the board.
- **3V3**: A 3.3-volt supply generated by the on-board regulator. Maximum current draw is 50 mA.
- **GND**: Ground pins.
- **IOREF**: This pin on the Arduino/Genuino board provides the voltage reference with which the microcontroller operates. A properly configured shield can read the IOREF pin voltage and select the appropriate power source, or enable voltage translators on the outputs to work with the 5V or 3.3V.
- **Reset**: Typically used to add a reset button to shields that block the one on the board.[7]



As per above diagram pin are fix in the Arduino board.

2)DC Motor:

An electric motor is an electromechanical device that converts electrical energy into mechanical energy.

Most electrical motors operates through the interaction of magnetic field and current carrying conductors to generate force. The reverse process, producing electrical energy from the mechanical energy, is done by generator such as an alternator or dynamo; some electric motor can also be used as generators, for example, a traction motor on a vehical may perform both tasks. Electrical motors and generators are commonly refer to electric machines.

Electric motors are found in applications as diverse as industrial fans, blowers and pumps, machine tools, household appliances, power tools, and disk drives.

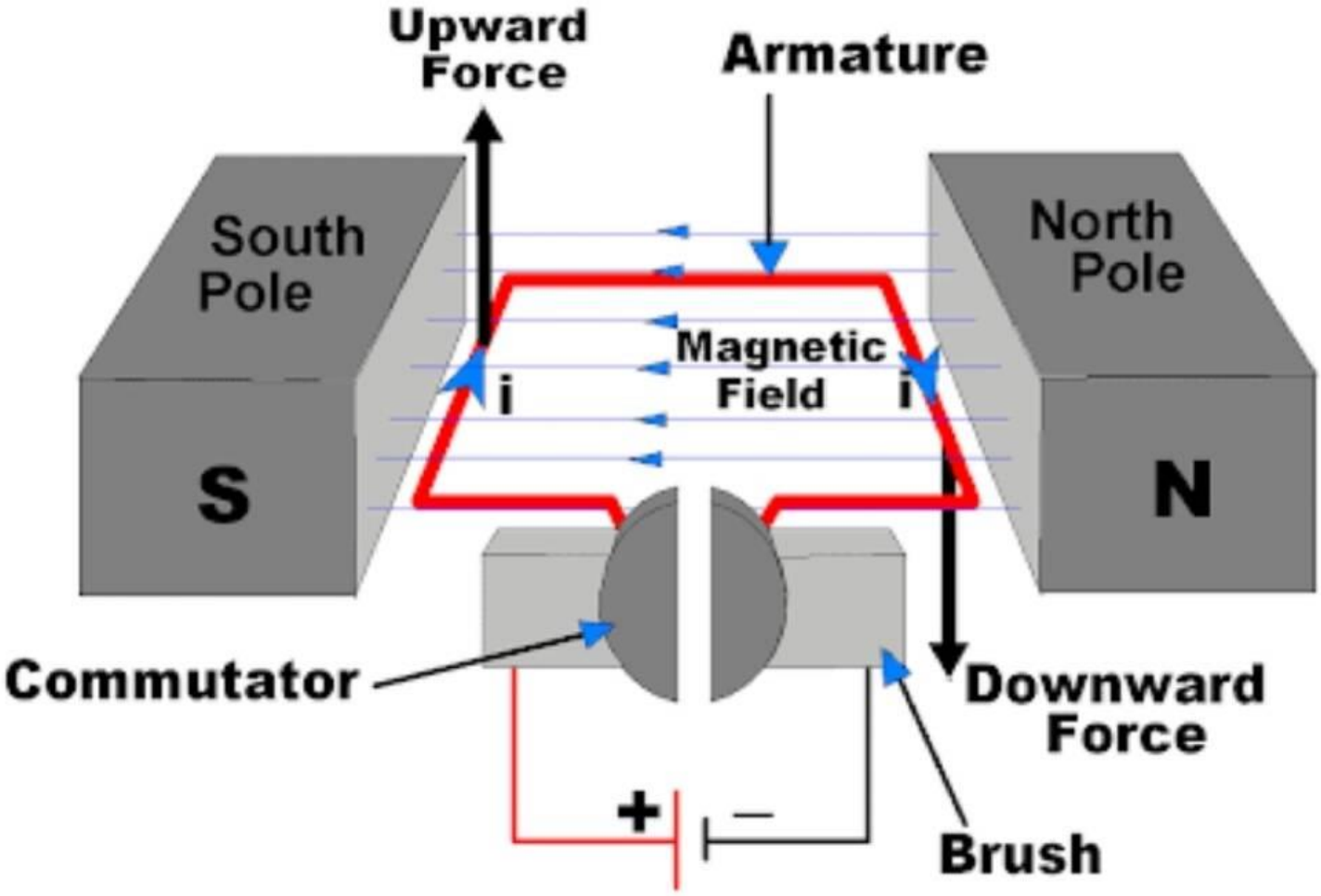
DC MOTOR WORKING:

Direct current (DC) motors are widely used to generate motion in a variety of products. Permanent magnet DC (direct current) motors are enjoying increasing popularity in applications requiring compact size, high torque, high efficiency, and low power consumption.

In a brushed DC motor, the brushes make mechanical contact with a set of electrical contacts provided on a commutation secure electrical circuit between the DC electrical source and coil winding on the armature. As the armature rotates on an axis, the stationary brushes come into contact with different sections of commentator

Permanent magnet DC motors utilize two or more brushes contacting a commutator which provides the direct current flow, which in turn provide the desired magnetic repulsion/attraction with the permanent magnets located around the periphery of the motor.

The brushes are conventionally located in brush boxes and utilize a U-shaped spring which biases the brush into contact with the commentator

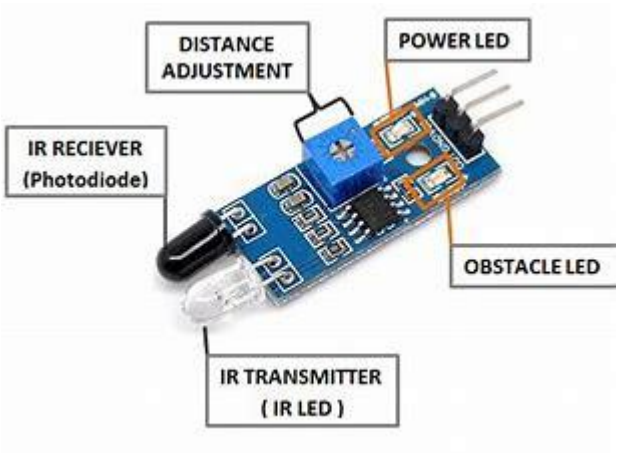


The brushless DC motor basically consist of shaft, a rotor assembly equipped with one or more permanent magnets arrange on the shaft, and a stator assembly which incorporates a stator component and phase windings. Rotating magnetic are formed by the current applied to the coil.

3)H-bridge motor driver

H bridge circuit is one of the other commonly used motor driver circuit. In robotic applications, were the DC motor has to run in backward and forward direction; H bridge circuits play a major role. The name H Bridge is used because of the diagrammatic representation of the circuit.

4)IR SENSOR:



An infrared sensor is an **electronic device**, that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measure only infrared radiation, rather than emitting it that is called a passive IR sensor. Usually, in the infrared spectrum, all the objects radiate some form of thermal radiation.

CODE USED FOR ARDUINO BOARD

Code for Arduino :

```
#include <IRremote.h>

int RECV_PIN = 11;

IRrecv irrecv(RECV_PIN);

decode_results results;

void setup()
{
 Serial.begin(9600);
 // In case the interrupt driver crashes on setup,
give a clue
 // to the user what's going on.
 Serial.println("Enabling IRin");
 irrecv.enableIRIn(); // Start the receiver
 Serial.println("Enabled IRin");
 pinMode(6, OUTPUT);
 pinMode(5, OUTPUT);
 pinMode(10, OUTPUT);
 pinMode(9, OUTPUT);

} void loop()
{

 if (irrecv.decode(&results)) {
  Serial.println(results.value, HEX);
  irrecv.resume(); // Receive the next value
```

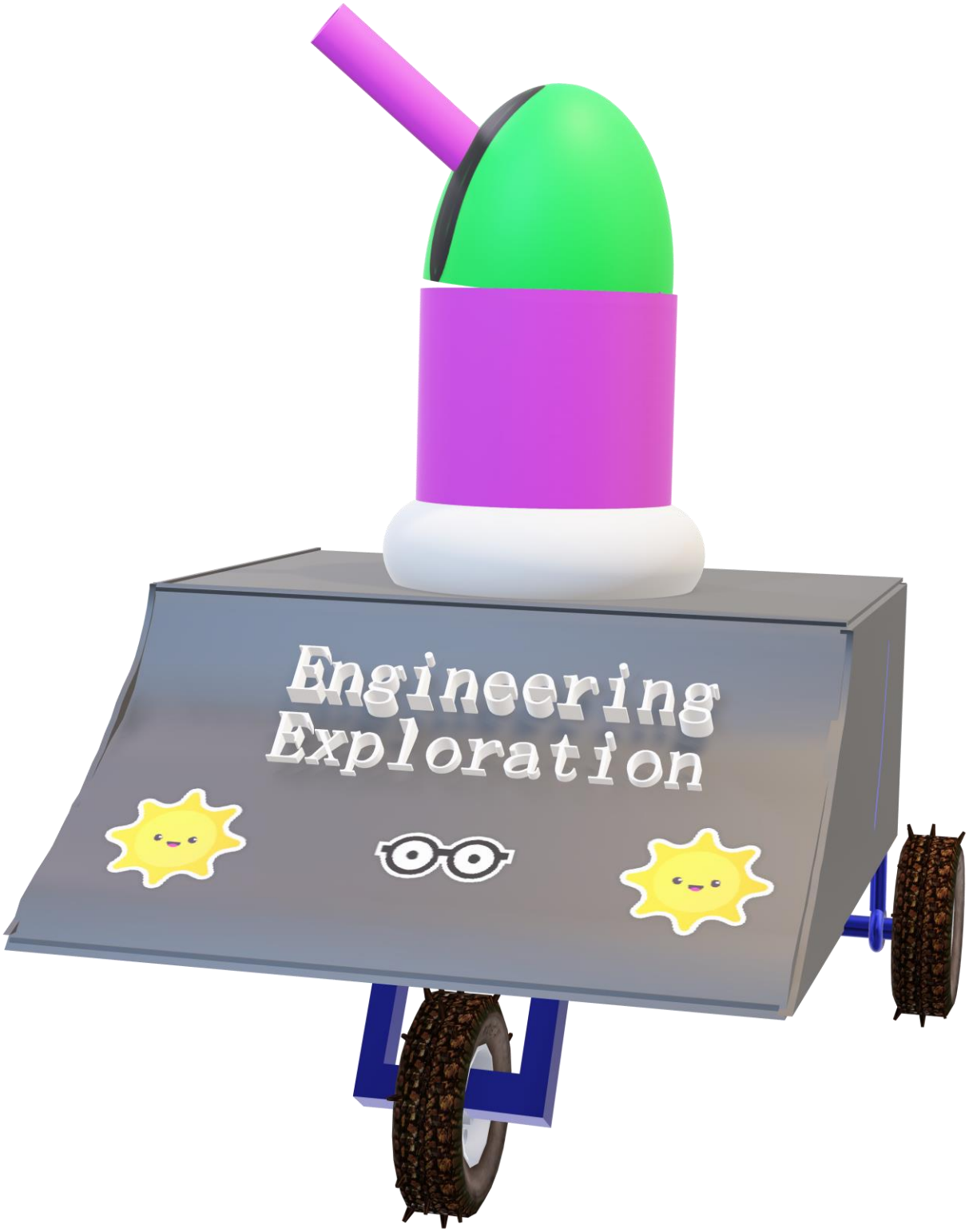
```
  if(results.value == 0xFD807F){
    //forward
    move(0,0,1,0);
   }
   else if (results.value == 0xFD906F){
    //back
    move(0,0,0,1);
   }
  else if (results.value == 0xFD609F){
    //right
    move(0,1,0,0);
   }

   else if (results.value == 0xFD20DF){
    //left
    move(1,0,0,0);
   }


  }
  delay(100);

 }
 void move(int m1a, int m1b, int m2a, int m2b){
  digitalWrite(6,m1a);
  digitalWrite(5,m1b);
  digitalWrite(10,m2a);
  digitalWrite(9,m2b);

 }
```

Code for Arduino 2 :

```
#include <IRremote.h>

int RECV_PIN = 11;

IRrecv irrecv(RECV_PIN);

decode_results results;

void setup()
{
 Serial.begin(9600);
 // In case the interrupt driver crashes on setup,
give a clue
 // to the user what's going on.
 Serial.println("Enabling IRin");
 irrecv.enableIRIn(); // Start the receiver
 Serial.println("Enabled IRin");
 pinMode(6, OUTPUT);
 pinMode(5, OUTPUT);
 pinMode(10, OUTPUT);
 pinMode(9, OUTPUT);

} void loop()
{

 if (irrecv.decode(&results)) {
  Serial.println(results.value, HEX);
  irrecv.resume(); // Receive the next value
```

```
if(results.value == 0xFD8877){
   //UPWARD
   move(0,0,1,0);
  }
  else if (results.value == 0xFD9867){
   //DOWNWARD
   move(0,0,0,1);
  }
  else if (results.value == 0xFD6897){
   //right ROTATION
   move(0,1,0,0);
  }

  else if (results.value == 0xFD28D7){
   //left ROTATION
   move(1,0,0,0);
  }


 }
 delay(100);

}

void move(int m1a, int m1b, int m2a, int m2b){
 digitalWrite(6,m1a);
 digitalWrite(5,m1b);
 digitalWrite(10,m2a);
 digitalWrite(9,m2b);

}
```

3-D MODEL



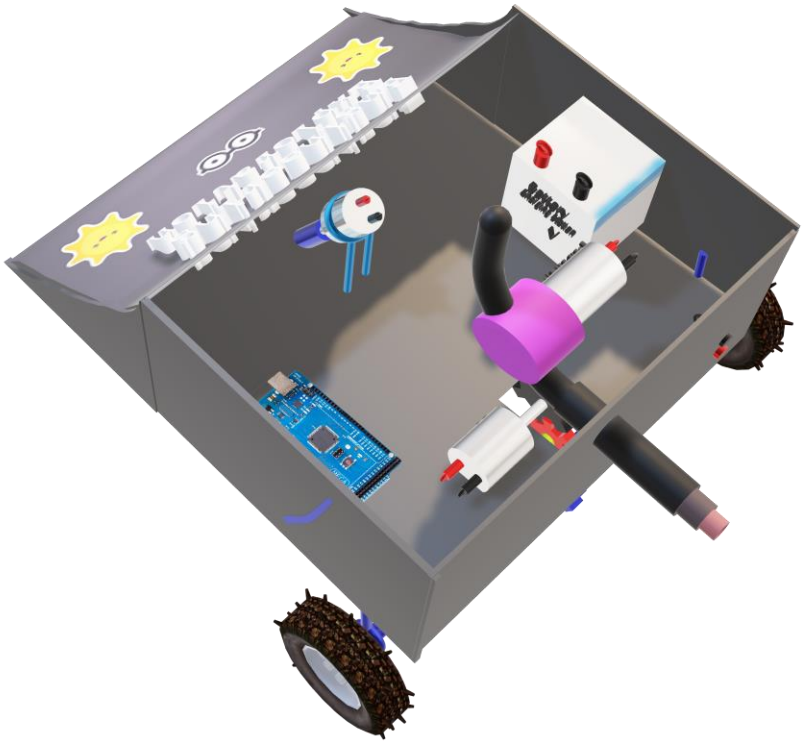
It’s 3-d view seen in word file

By clicking on it

CONSTRUCTION OF MACHINE

As per seen in above model, this machine contains all the plastic body. So that it will not have more weight. It contains three wheels two are on back side and one on front side. It can throw water from upper side of pipe.

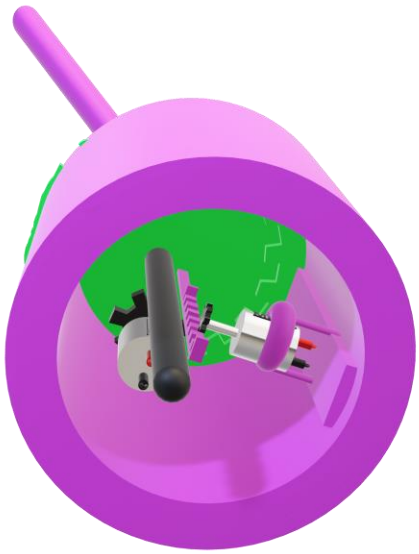
1)LOWER PART 3-D MODEL (in word file):



The lower part contains all the main components.

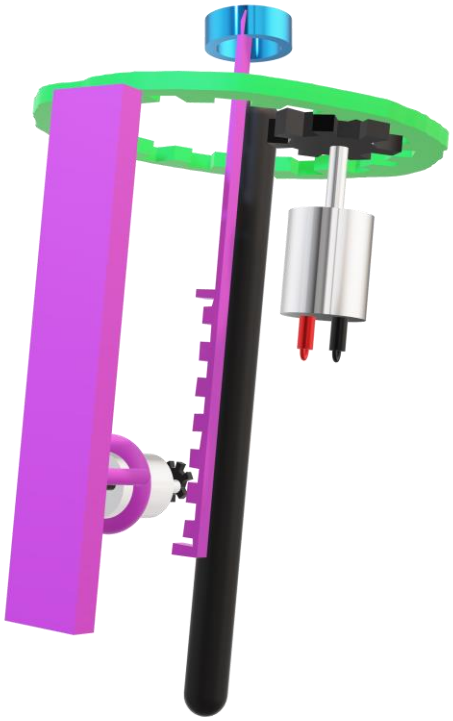
It contains two Arduino board, battery, 3 motors (2 as motor, 1 as generator) and it contains pipe, which is joint with outerpipe.

2)UPPER PART 3-D MODEL:



Upper part is as like of given figure, it contains 1 movable pipe, 1 stationary pipe, 2 motors which are fixed at its positions

CROSS SECTION:



When 2 button pressed lower motor rotate anticlockwise, so the part connected is moves up side and connected pipe going to upper side. By pressing 8 gives vice-versa of 2.

When 6 button pressed upper motor moves anticlockwise and upper part rotates right. And by pressing4 it moves vice-versa of 6.

WORKING

When the remote control is operated, it moves as its way. When upper arrow button pressed, it moves in forward direction. When lower arrow of remote pressed it moves backward direction. As this way right hand side arrow pressed it moves right side, and left hand arrow pressed it moves left side.

2,4,6,8 button has code on second Arduino . When we pressed 2 button pipe moves on upward, 8 button pressed pipe moves downward direction. As this way when 6 button pressed pipe upper round part rotates right side, and 4 button pressed it rotates left.

As this way it cover all area of garden.

SCOPE OF PROJECT

1) It is used in garden of our house.
2) It also used at construction site to give water on walls.
3) It used at big garden also.
4) By using cap like shower, it used as sprinkler which is portable.
5) It is also used on your house street after cleaning.

Advantages

1) It is easy to use.
2) Portable with low electricity consumption.
3) It gives joy to children to give water to trees.
4) Also, it gives habit to children to give water to plants.
5) Most of area of garden covered by this.
6) It is small in size (65cm).

Disadvantages

1) If pipe folded and stuck the flow of water it can't solve this.
2) After completion of giving water pipe will not on its position.
3) It will not totally automatic.
4) If it accidently turns then, it can't turn to original itself.

REFERENCES

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