A Project Report

on

Automated Plant Watering System

Introduction

In the present day, in the field of agriculture farmers are facing major problems in watering their crops. It's because they don't have a proper idea about the availability of power. Even if it is available, they need to pump water and wait until the field is properly watered, which compels them to stop doing other activities – which are also important for them, and thus they lose their precious time and efforts. But, there is a solution – " An Automatic Plant Irrigation System " not only helps farmers but also others for watering their gardens as well. Healthy plants can transpire a lot of water, increasing the humidity of the Greenhouse air.

Data Statistics

A high relative humidity (above 80 – 85 %) should be avoided because it can increase the incidence of the disease and plant transpiration. Sufficient venting or successive heating and venting can prevent condensation on plant surfaces and the greenhouse structure. The use of the cooling system during the warmer summer months increases the greenhouse air humidity. During periods with Warm and humid outdoor conditions, humidity control inside the greenhouse can be a challenge. A greenhouse located in dry environments benefits greatly from the evaporative cooling system because a large amount of water can be evaporated into the incoming air, resulting in significant temperature drops.

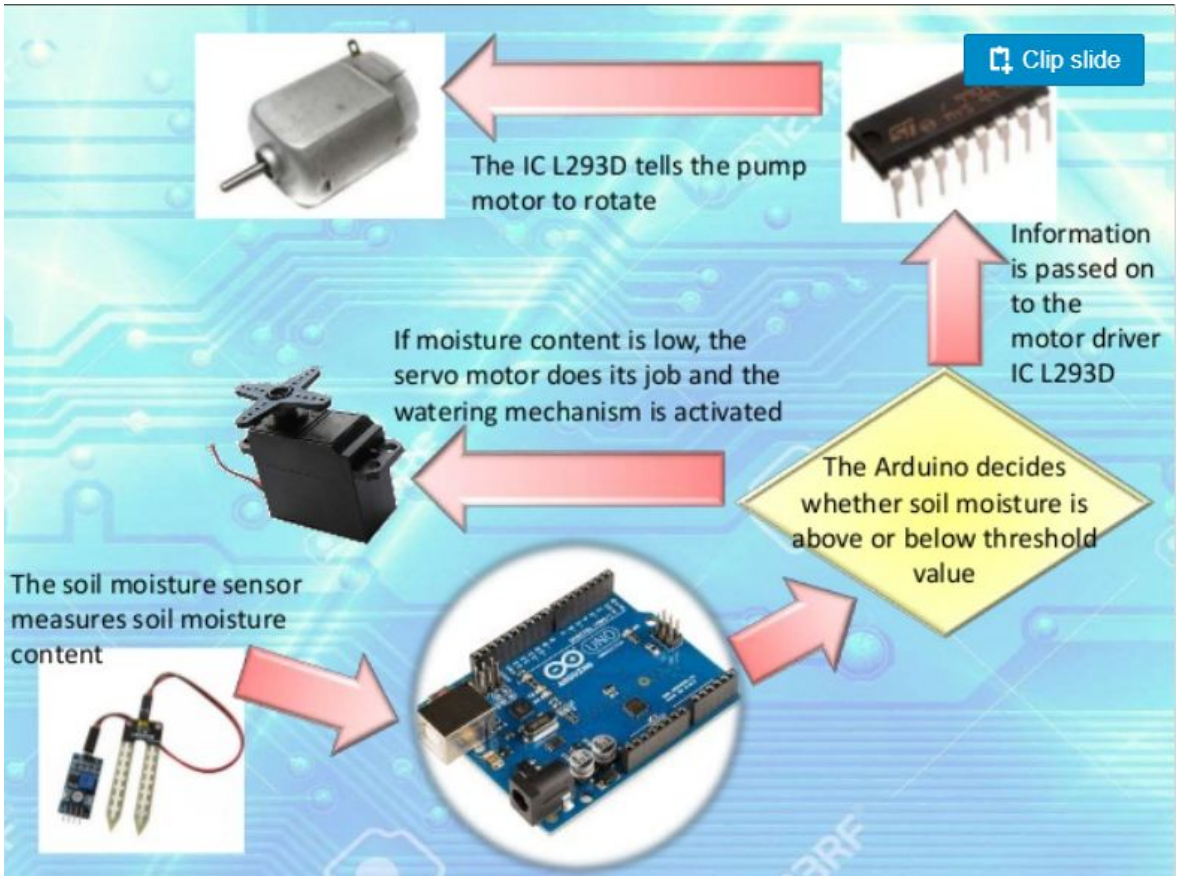
This automatic irrigation system senses the moisture content of the

soil and automatically switches the pump when the power is on. Proper usage of irrigation system is very important because the main reason is the shortage of land reserved water due to lack of rain, unplanned use of water as a result large amounts of water goes waste. For this reason, we use this automatic plant watering system, and this system is very useful in all climatic conditions

More information can be found on https://www.researchgate.net/publication/321307351_Automatic_Plant_Watering_System

OBJECTIVE

The main objective of this project is to automate the plant watering system. Farmers won't have to do any physical labor and with machine help, it becomes a lot more efficient and easy for them. Conventional irrigation methods use a lot of water, and needless to say, a lot of it is wasted daily. With the help of advanced methods of irrigation, which should ideally use just the correct amount of water needed for the plants, we could save a considerable amount of water. With the help of soil moisture sensors, we could use just the right amount of water needed for irrigation - and that is the motivation of this project.



LIST OF HARDWARE USED

- Arduino Uno
- Soil moisture sensor module
- Motor driver IC L293D
- Servo motor
- Pump motor
- 12V DC adapter
- Wires and jumper cords.

BLOCK DIAGRAM

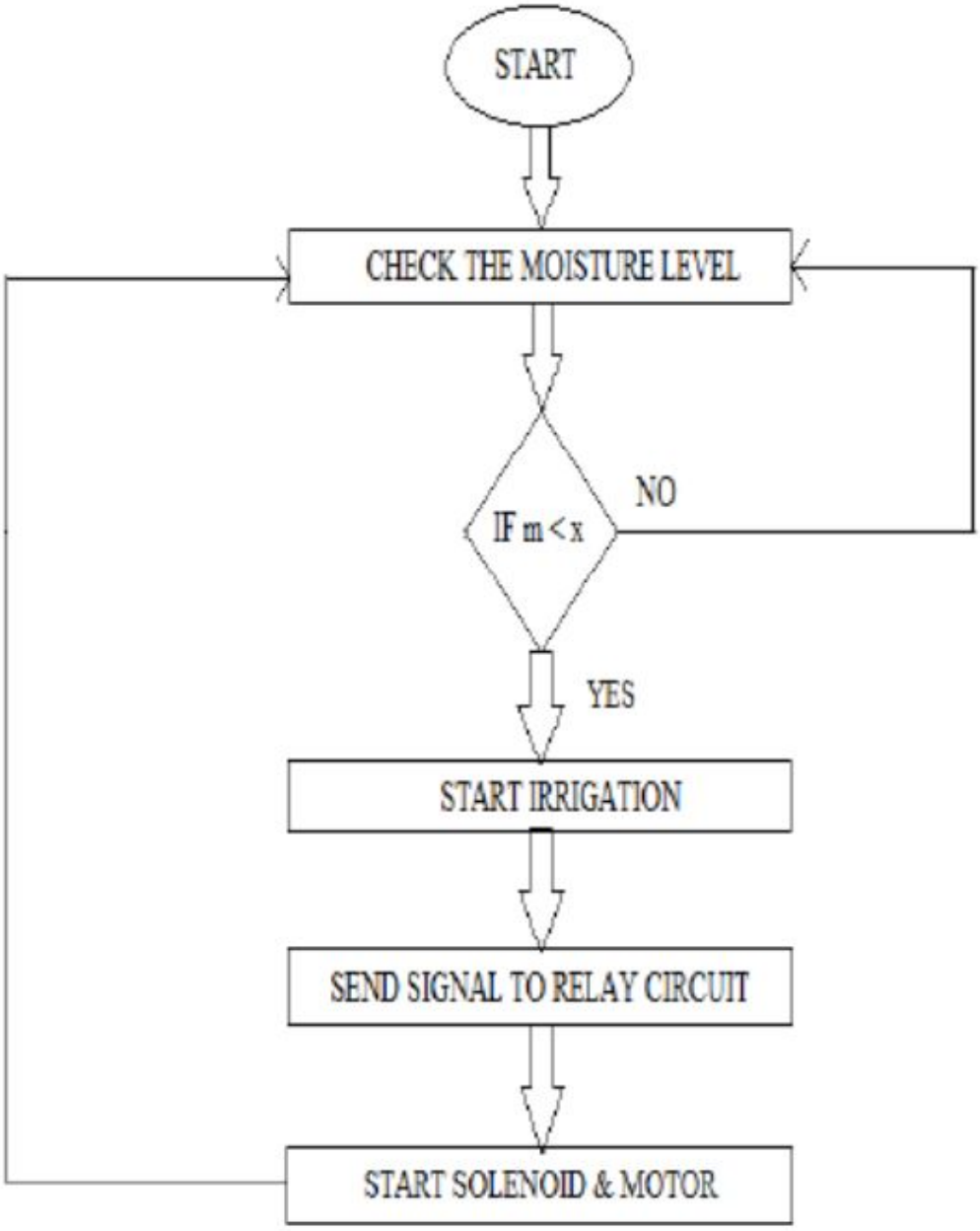
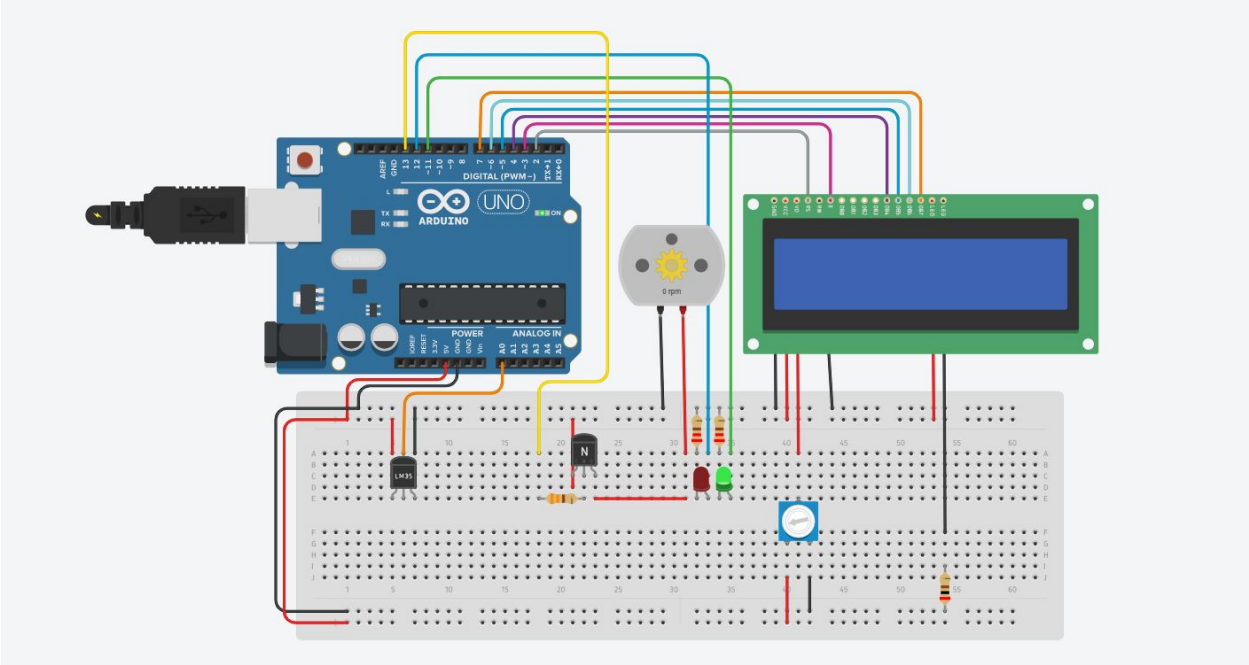


Fig 2 – Flowchart On Automatic Plant Watering System

HARDWARE IMPLEMENTATION



SOFTWARE IMPLEMENTATION

```
#include <LiquidCrystal.h>

const int LM35 = A0;
const int motor = 13;
const int LedRed = 12;
const int LedGreen = 11;



LiquidCrystal lcd(2, 3, 4, 5, 6, 7);

void setup() {
  Serial.begin(9600);
  lcd.begin(16, 2);
  lcd.print("Automated Plant");
  lcd.setCursor(0,1);
  lcd.print("Watering System!");
  pinMode(motor, OUTPUT);
  pinMode(LedRed, OUTPUT);
  pinMode(LedGreen, OUTPUT);
  delay(2000);
  lcd.clear();
  lcd.print("Temp= ");
```

```
  lcd.setCursor(0,1);
  lcd.print("WaterPump= ");
}

void loop() {

  int value = analogRead(LM35);
  float Temperature = value * 500.0 / 1023.0;
  lcd.setCursor(6,0);
  lcd.print(Temperature);
  lcd.setCursor(11,1);


  if (Temperature > 50){
    digitalWrite(motor, HIGH);
    digitalWrite(LedRed, HIGH);
    digitalWrite(LedGreen, LOW);
    lcd.print("ON ");
  }
  else {
    digitalWrite(motor, LOW);
    digitalWrite(LedRed, LOW);
    digitalWrite(LedGreen, HIGH);
    lcd.print("OFF");
```

```
  }
   delay(1000);
}
```

FUTURE SCOPE

The proposed system consists of less hardware as compared to the previous model hence it is compact as compared to the previous system. It is more cost-efficient, this claim is made on the fact that the proposed system does not need the heavy and expensive hardware for implementation. This type of automated irrigation system consumes 40-50% less water as compared to the traditional system Ideal growth condition is been provided when a small amount of water is been applied over a large amount of time. This smart irrigation system extends the watering time for plants and provides ideal growth conditions. It saves time and timer delay as per the environmental condition can be added for automatic watering. This smart irrigation system can be adjusted and modified according to the changing environment. It is simple to operate it starts by designing the map of your garden and marking the location of planting.

CONCLUSION

Thus the “AUTOMATIC PLANT WATERING SYSTEM” has been designed and tested successfully. It has been developed by integrated features of all the hardware components used. The presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. The system has been tested to function automatically. The moisture sensors measure the moisture level (water content) of the different plants. If the moisture level is found to be below the desired level, the moisture sensor sends the signal to the microcontroller which triggers the Water Pump to turn ON and supply the water to the respective plant. When the desired moisture level is reached, the system halts on its own and the Water Pump is turned OFF. Thus, the functionality of the entire system has been tested thoroughly and it is said to function successfully