Project

Internet of Things

with Mr.Massinissa HAMIDI ,Seyed MODARESI

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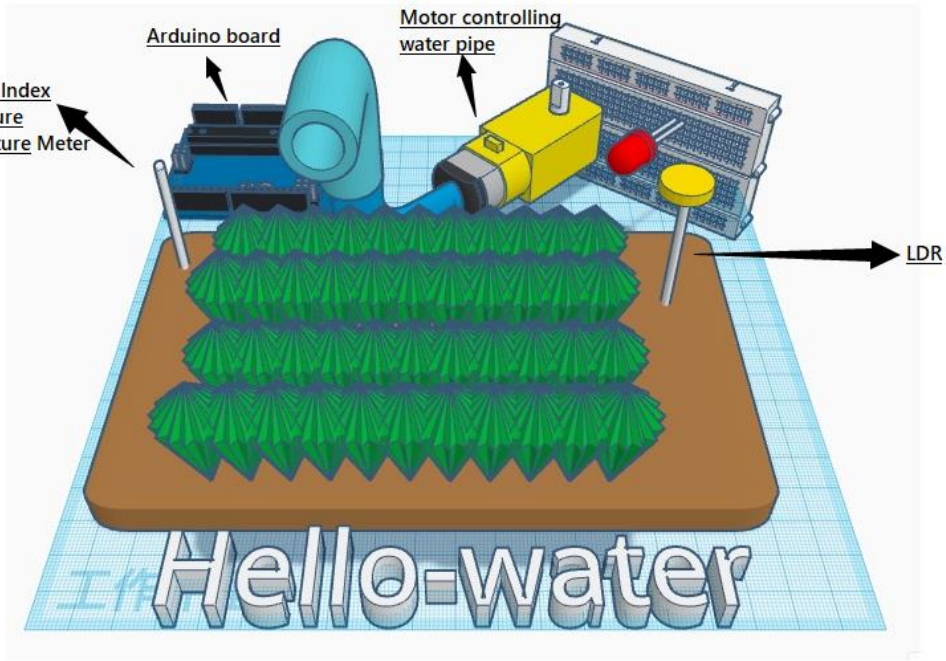
Project Description

With the development of economy and technology nowadays,we sometimes don't have enough time to tend our plants due to the quickening pace of life. Also, people with no experience may have a tendency to water plants at a wrong time or not sure about the amount of water they need.
Therefore a need of smart & automatic gardener emerges.Our goal is to design a 'gardener' as such with soil moisture detection, Sunlight detection. Automatic watering function with smart device control or according to weather report,alarm set etc.

From the several detection devices and watering machine. we also need ESP32 and LoRa module to transfer data, like the moisture information and weather condition. While the data can be processed in the cloud and automatically sent to the clients, we can have access to that from web browser.

Global Schema-Conceptional Product Image



Related Competitor

Vistefly Testeur d
Les Tests de Nutri
de Vistefly
4 éva
Prix : 27,98 € prime
Tous les prix incluer
Message promotionnel
Livraison GRATUITE
1 neuf à partir de 27,98 €
Couleur: Kit de Test de S
- Le meilleur kit d'
testeur de sol(testeur
- arrosage Automa
peut contrôler la vitess
maintenir la quantité
- Testeurs de Sol R
lumière du soleil et la
et la précision de la te
- Facile à connecte
Bluetooth, pour en sav
méthodes reconnaissa
- Applications mul
arroseur automatique

With some of the current apps /smart device checked on the Appstore /amazon and eBay. We found that there is not an integrated device or app that combine status detecting , displaying with watering offline.

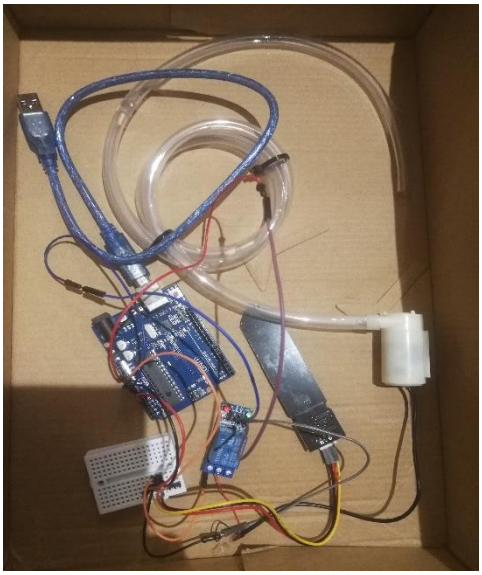
Take this best-selling soil tester as an example. Regardless of its 28€ price. There exist such drawbacks:

1. The volume of water stored is relatively small. In case of a long-holiday-outing, plants could easily get withered.
2.It doesn't have an smart device application displaying all the status. What if the clients actually want to keep track of the ,for instance, PH or moisture index of the soil?
With all those flaws exposed. Our ideal design is rather competitive in nowadays IoT gear market.

Compared with this product or all the other products on the market. Our product does have some competitive advantages over others.

Our Approach & Project Outcome

So far we have finished the whole part of the project. Maybe later we will do some improvements on this if possible.
The exterior structure of our project work is shown in the picture below:



We combine Arduino, moisture detector, LDR Sensor, relay, pump together to make sure the device can water when the moisture is under the threshold.

1. LDR Sensor

In order to detect the intensity of light or darkness, we use a sensor called an LDR (light dependent resistor).

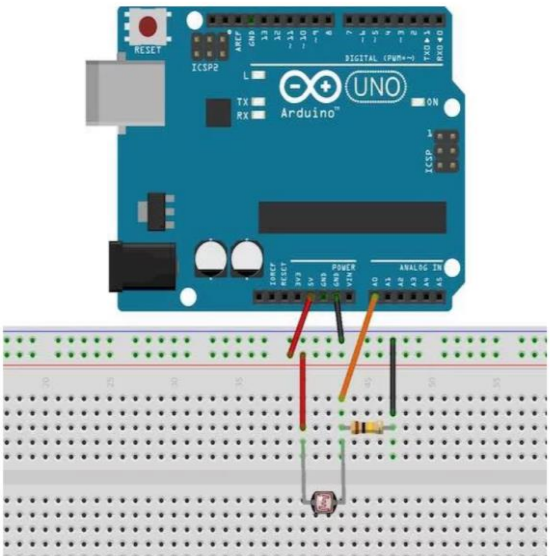


Figure 1 Connection Diagram of LDR circuit

The LDR is a special type of resistor that allows higher voltages to pass through it (low resistance) whenever there is a high intensity of light, and passes a low voltage (high resistance) whenever it is dark.

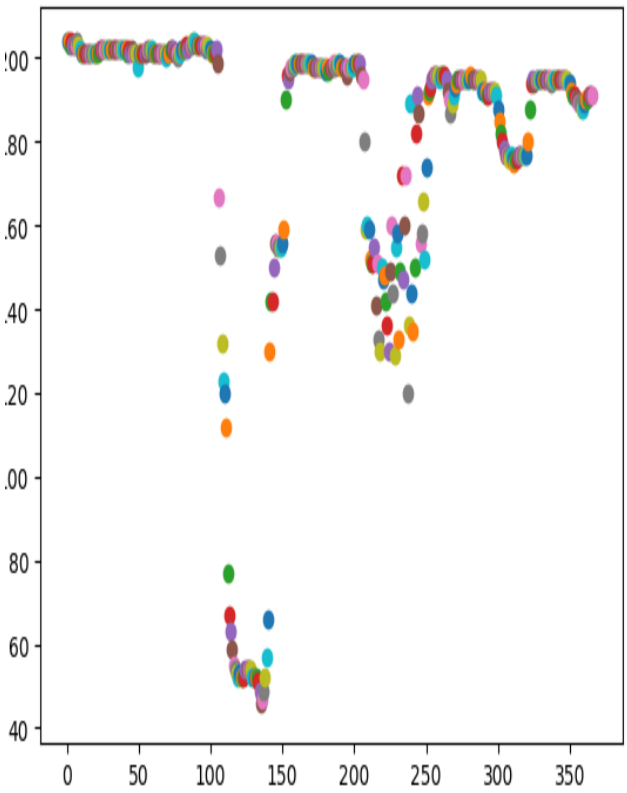


Figure 2 Plotting Output of Data from LDR

The LDR gives out an analog voltage when connected to VCC (5V), which varies in magnitude in direct proportion to the input light intensity on it. That is, the greater the intensity of light, the greater the corresponding voltage from the LDR will be. See figure 1 to see how we connect LDR circuit.

Since the LDR gives out an analog voltage, it is connected to the analog input pin on the Arduino. The Arduino, with its built-in ADC (analog-to-digital converter), then converts the analog voltage (from 0-5V) into a digital value in the range of (0-1023). When there is sufficient light in its environment or on its surface, the converted digital values read from the LDR through the Arduino will be in the range of 800-1023.See figure 2 to check the output signal of an LDR circuit.

2. moisture detector

Soil moisture meters can tell the resistance of the soil then calculate the moisture index. Nowadays moisture meters can be very accurate, A superb moisture meter can be accurate

within 0.1% of the moisture content. Although Lower-grade moisture meters aren't very accurate as numbers are misleading and changing.

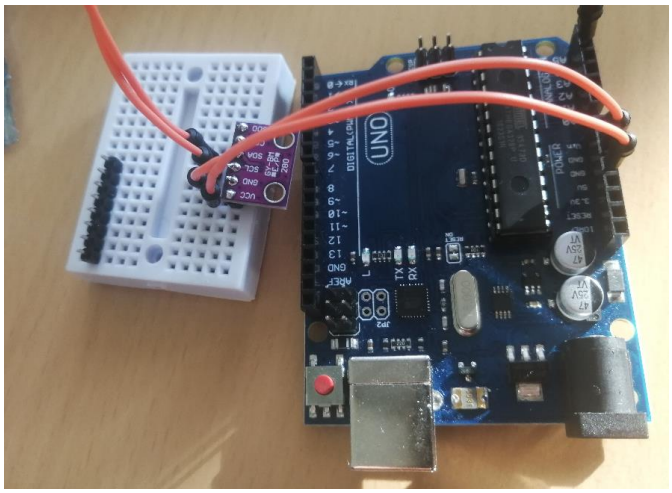


Figure 3

For the moisture detector, We successfully made it functional.

Using board BME-280,Moisture index, air pressure and temperature of the environment can be measured with a relatively high accuracy which meets our product's goal.

See Figure 3 to check the physical picture of the connection of this module using a BME-280 board.

See Figure 4 to check the output signal of this module. It's clear that environment temperature, air pressure and moisture index are well-displayed.

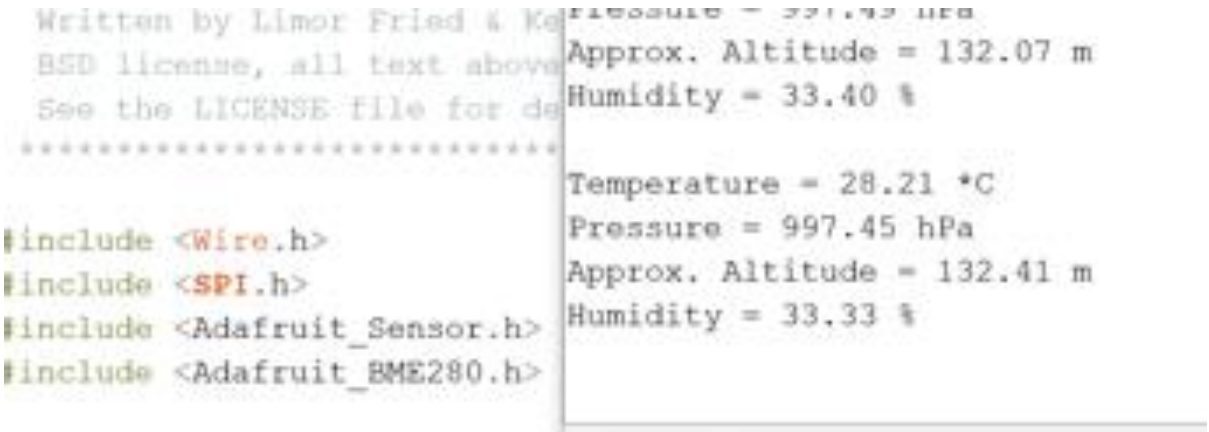


Figure 4

Code

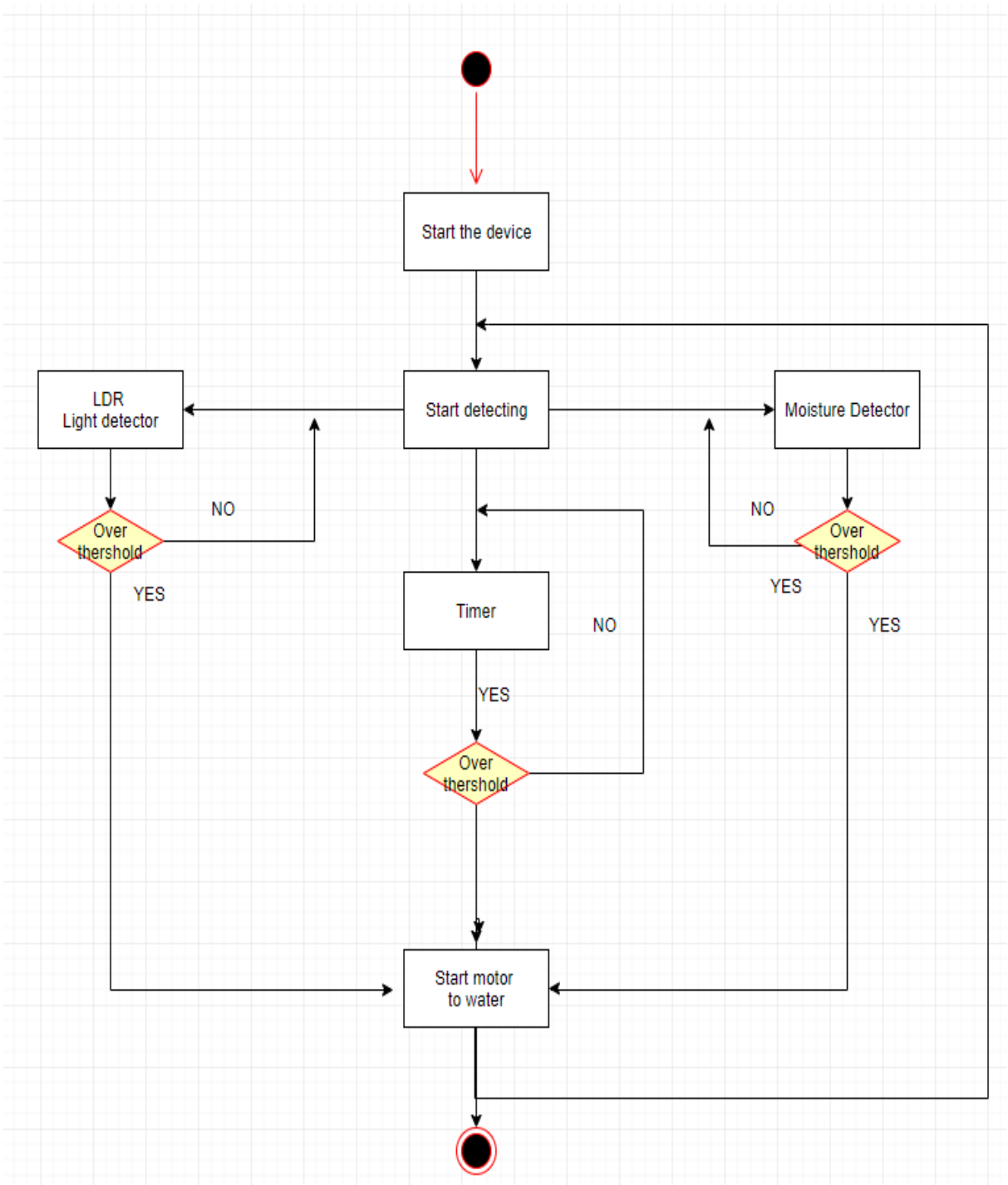
Code -LDR \Moisture\ Weather API

```
#define SensorPin A0
#include <Servo.h>
float sensorValue = 0;
int pumpin=2;

void setup() {
  Serial.begin(9600);
  pinMode(2,OUTPUT);
}

void loop() {
 for (int i = 0; i <= 100; i++)
 {
   sensorValuem = sensorValuem +
 analogRead(SensorPin);
   delay(1);
 }
  sensorValuem = sensorValuem/100.0;
   if(sensorValuem>650)
   {
    digitalWrite(pumpin,LOW);//打开水泵
    delay(3000);//浇水时间三秒
    digitalWrite(pumpin,HIGH);//关闭水泵
    }
   else
   {
    digitalWrite(pumpin,HIGH);
    }
 Serial.println(sensorValuem);
 delay(6000);
}
```

```
int sensorPin = A0; // select the input pin for LDR

int sensorValue = 0; // variable to store the value coming from the sensor
void setup() {
Serial.begin(9600); //sets serial port for communication
}
void loop() {
sensorValue = analogRead(sensorPin); // read the value from the sensor
Serial.println(sensorValueL); //prints the values coming from the se
nsor on the screen
   if(sensorValueL>650)
   {
    digitalWrite(pumpin,LOW);
    delay(3000);
    digitalWrite(pumpin,HIGH);
    }
   else
   {
    digitalWrite(pumpin,HIGH);
    }
 Serial.println(sensorValueL);
 delay(6000);
}
delay(100);

}
```

```
http.begin("https://samples.openweathermap.org/data/2.5
/weather?q=London,uk&appid=b6907d289e10d714a6e88b30761fae22");
//Specify the URL
   int httpCode = http.GET();  //Make the request

   String payload;
   if (httpCode > 0) { //Check for the returning code
     String payload = http.getString();
     Serial.println(httpCode);
     Serial.println(payload);
     DeserializationError error = deserializeJson(doc, payload);
     if (error) {
       Serial.print(F("deserializeJson() failed: "));
       Serial.println(error.c_str());
       delay(120000);
     return;
   }
   // Get the root object in the document
   JsonObject root = doc.as<JsonObject>();

   float temperature = root["main"]["temp"];
   int humidity = root["main"]["humidity"];
   int pressure = root["main"]["pressure"];

   Serial.println(humidity);
   delay(2000);

   Serial.println(pressure);
   delay(2000);
   temperature = round(temperature);
   Serial.println(temperature);
   delay(30000);
   } else {
     Serial.println("Error on HTTP request");
     delay(30000);
   }
   http.end(); //Free the resources
  }
}
```

UML


Start the device
Start detecting
LDR
Light detector
Moisture Detector
Over
thershold
NO
YES
Timer
NO
YES
Over
thershold
NO
Over
thershold
YES
YES
Start motor
to water