

Course Name: Internet Of Things Lab

Course code: 21CSP-344

## **Experiment 2.2**

**Aim:** *To investigate real-time relationship between humidity and temperature in IoT.*

### **Objectives:**

- *Learn about DH11 sensor interfacing.*
- *Learn about IoT programming.*

### **Hardware:**

- *Arduino Board*
- *Breadboard*
- *Jumper Wires*
- *DH11 Temperature and Humidity Sensor*

### **Description:**

#### **Arduino:**

*It is an open-source electronics platform. It consists ATmega328 8-bit Micro controller. It can be able to read inputs from different sensors & we can send instructions to the micro controller in the Arduino. It provides Arduino IDE to write code & connect the hardware devices like Arduino boards & sensors.*

#### **DH11 Sensor:**

*The DH11 sensor, also known as the DHT11 sensor, is a low-cost digital temperature and humidity sensor. The DH11 sensor is a compact, inexpensive sensor that can measure both temperature and humidity, making it ideal for various DIY electronics and IoT projects.*

#### **DHT11 Module Pinout:**

*The DHT11 module has a total of 3 pins. In which two are for power and one is for communication.*

*The pinout of a DHT11 Sensor module is as follows:*

- *DATA Data pin for I-wire communication.*
- *GND Ground Connected to Ground pin of the Arduino.*
- *VCC Provides power for the module, Connect to the 5V pin of the Arduino.*

### **Code:**

```
#include <Adafruit_Sensor.h>
#include <DHT.h>
#include <DHT_U.h>
```

Course Name: Internet Of Things Lab

Course code: 21CSP-344

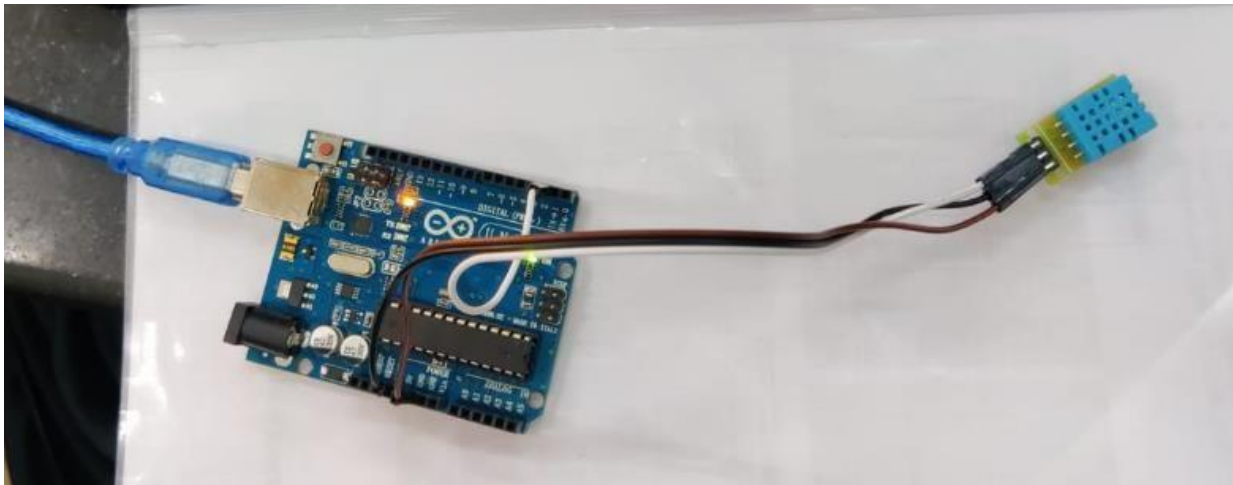
```
#define DHTTYPE DHT11
#define DHTPIN 2

DHT_Unified dht(DHTPIN, DHTTYPE);
uint32_t delayMS;

void setup() {
  Serial.begin(9600);
  dht.begin();
  sensor_t sensor;
  delayMS = sensor.min_delay / 1000;
}

void loop() {
  sensors_event_t event;
  dht.temperature().getEvent(&event);
  Serial.print(F("Temperature: "));
  Serial.print(event.temperature);
  Serial.println(F("°C"));
  dht.humidity().getEvent(&event);
  Serial.print(F("Humidity: "));
  Serial.print(event.relative_humidity);
  Serial.println(F("%"));
  delay(delayMS);
}
```

**Output:**



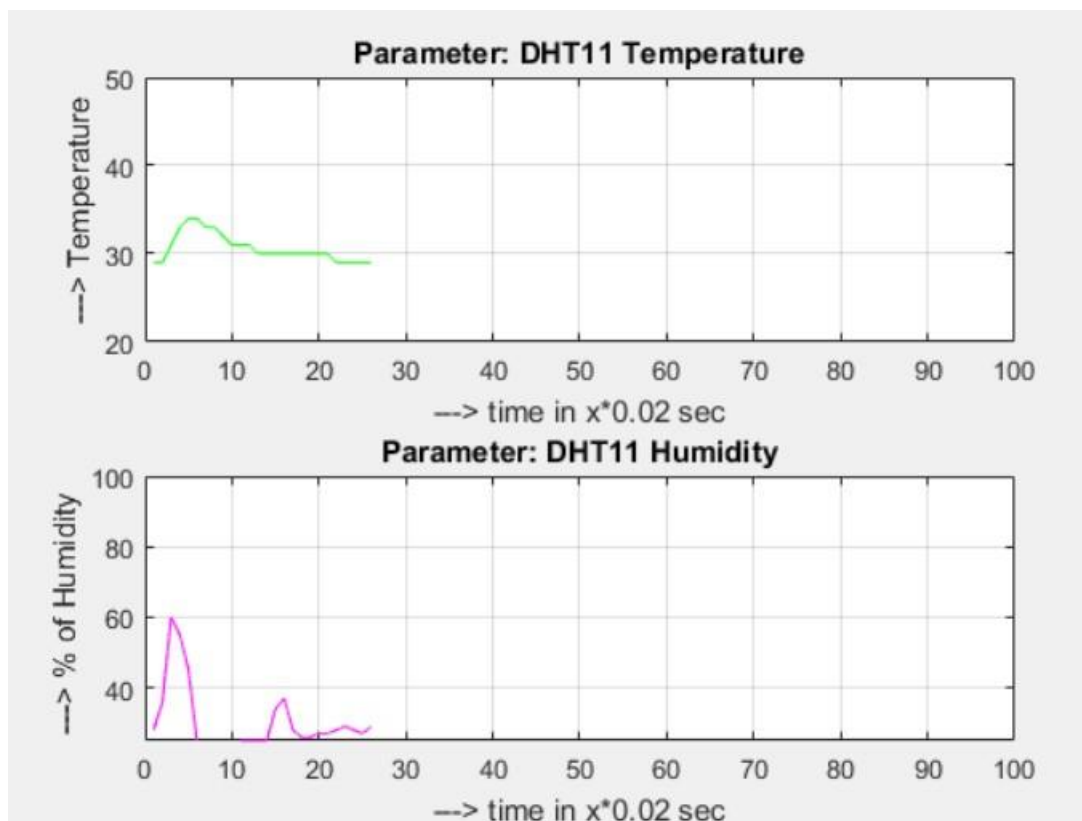
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COM3 (Arduino/Genuino Uno)

DHTxx test!

```
Humidity: 69.00 %    Temperature: 26.00 *C 78.80 *F    Heat index: 27.26 *C 81.06 *F
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Humidity: 69.00 %    Temperature: 26.00 *C 78.80 *F    Heat index: 27.26 *C 81.06 *F
```



### Learning Outcomes:

1. Learn the use of sensors.
2. Learn to perform task on real hardware without using any virtual platform.
3. Learn to know about how DH11 sensor works.