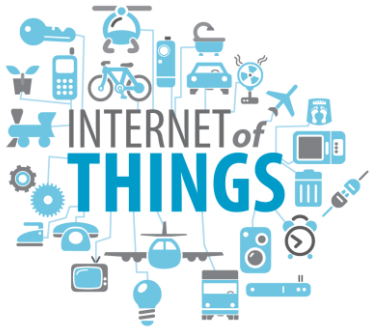
UNIVERSITY OF SCIENCE - VNUHCM
Faculty of Information Technology

INTERNET OF THINGS

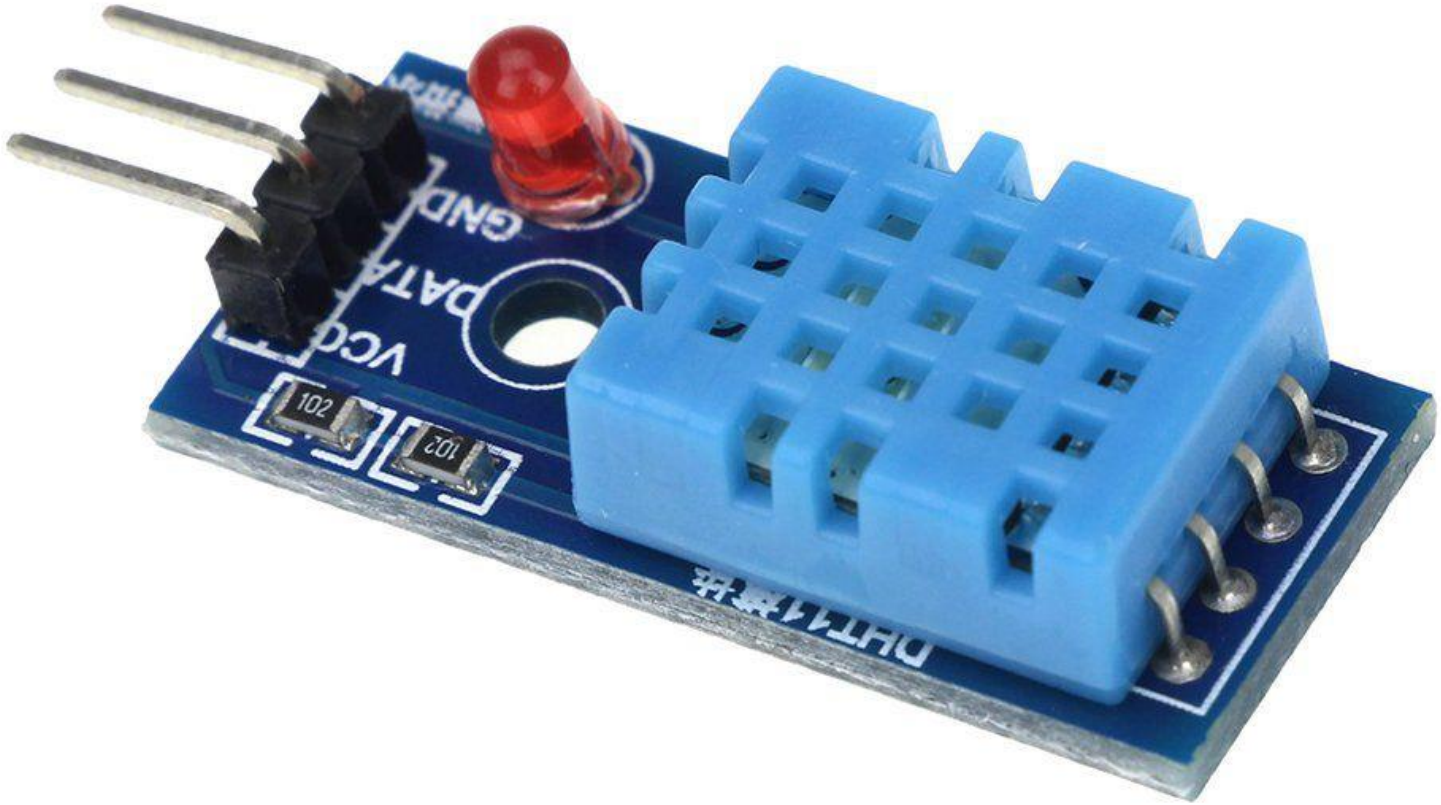
1.9

TEMPERATURE & HUMIDITY SENSOR



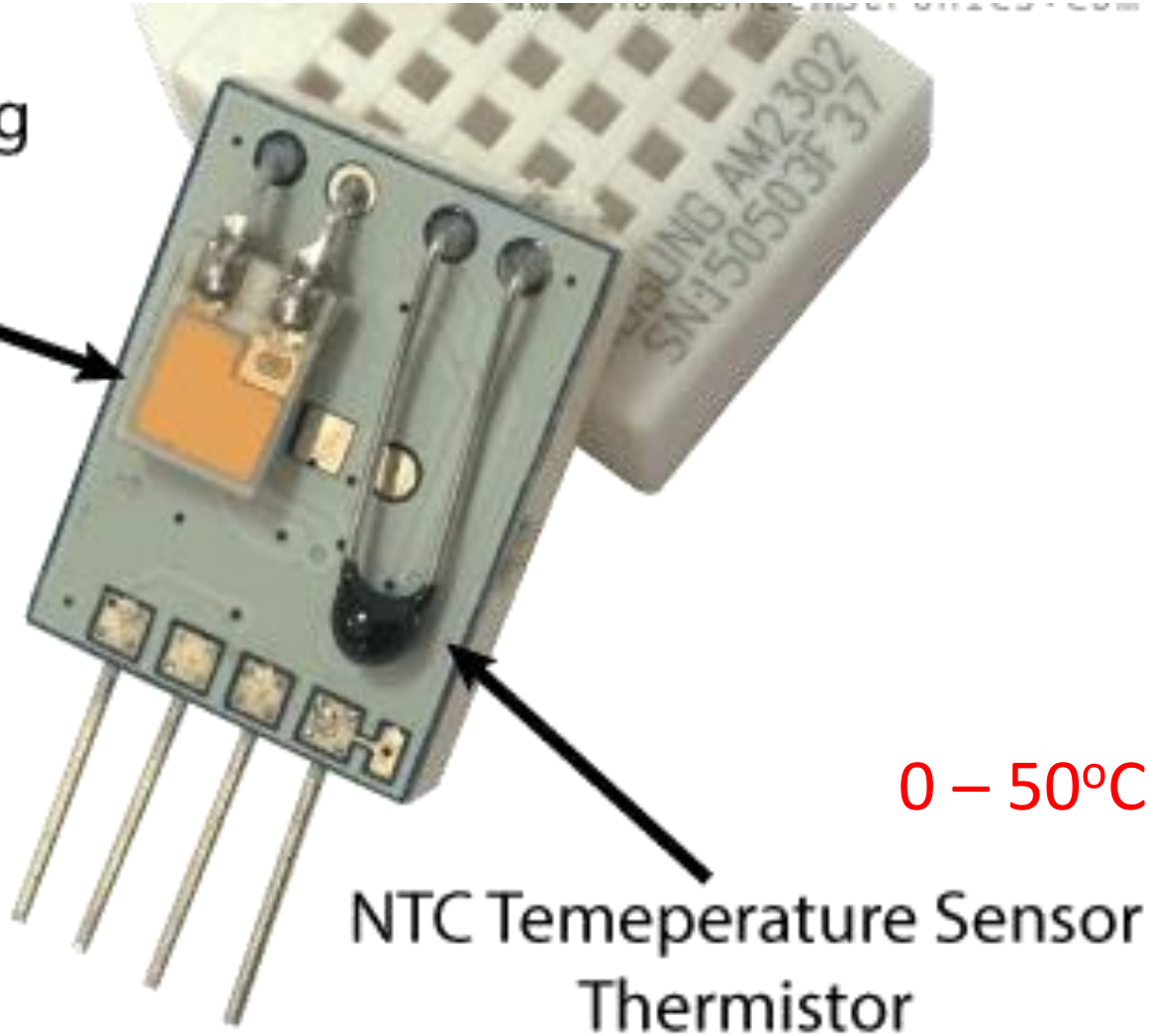
LECTURER: CAO XUÂN NAM

Temperature & Humidity Sensor DHT11



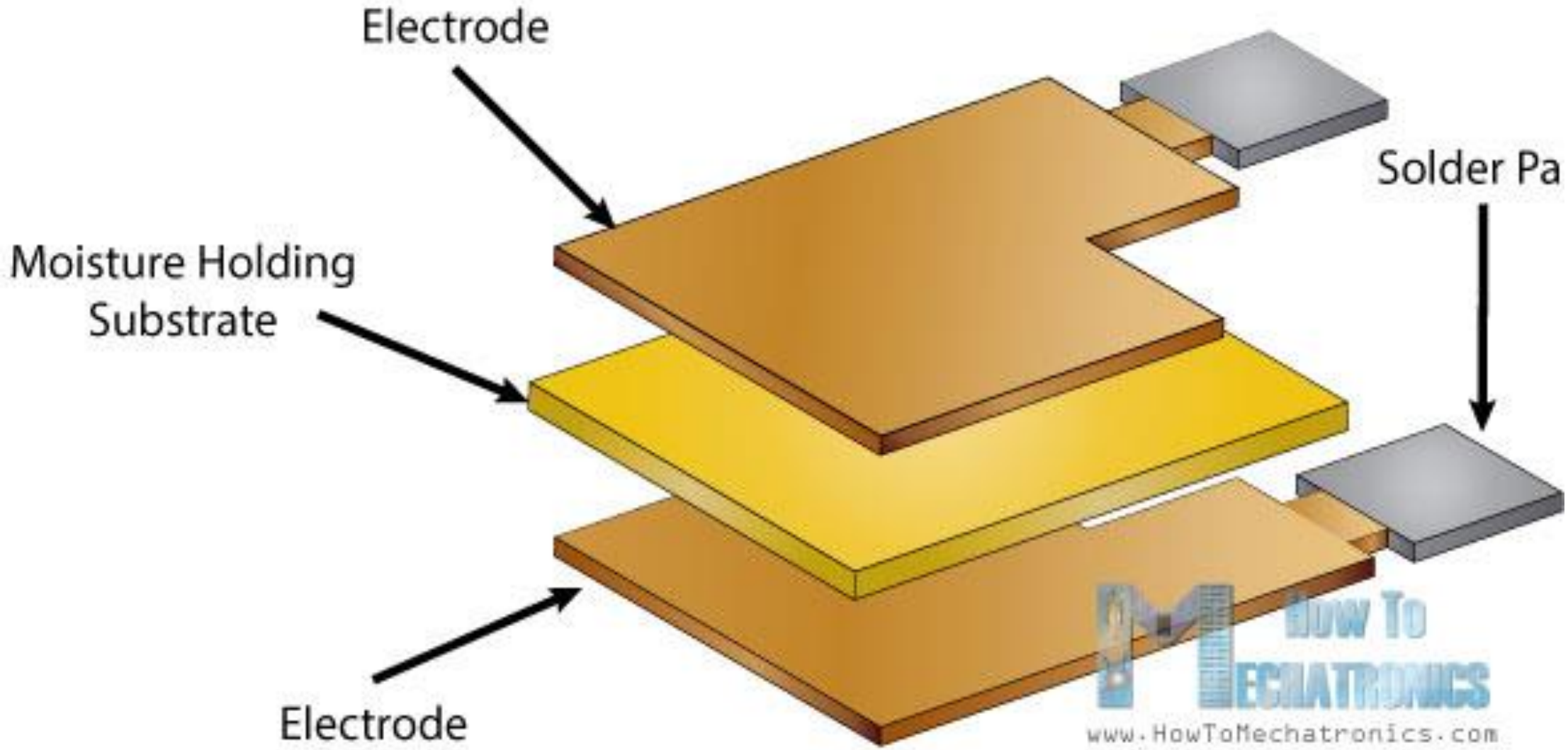
Humidity Sensing Component

20 – 80% ± 5%



0 – 50°C ± 2°C

NTC Temeperature Sensor Thermistor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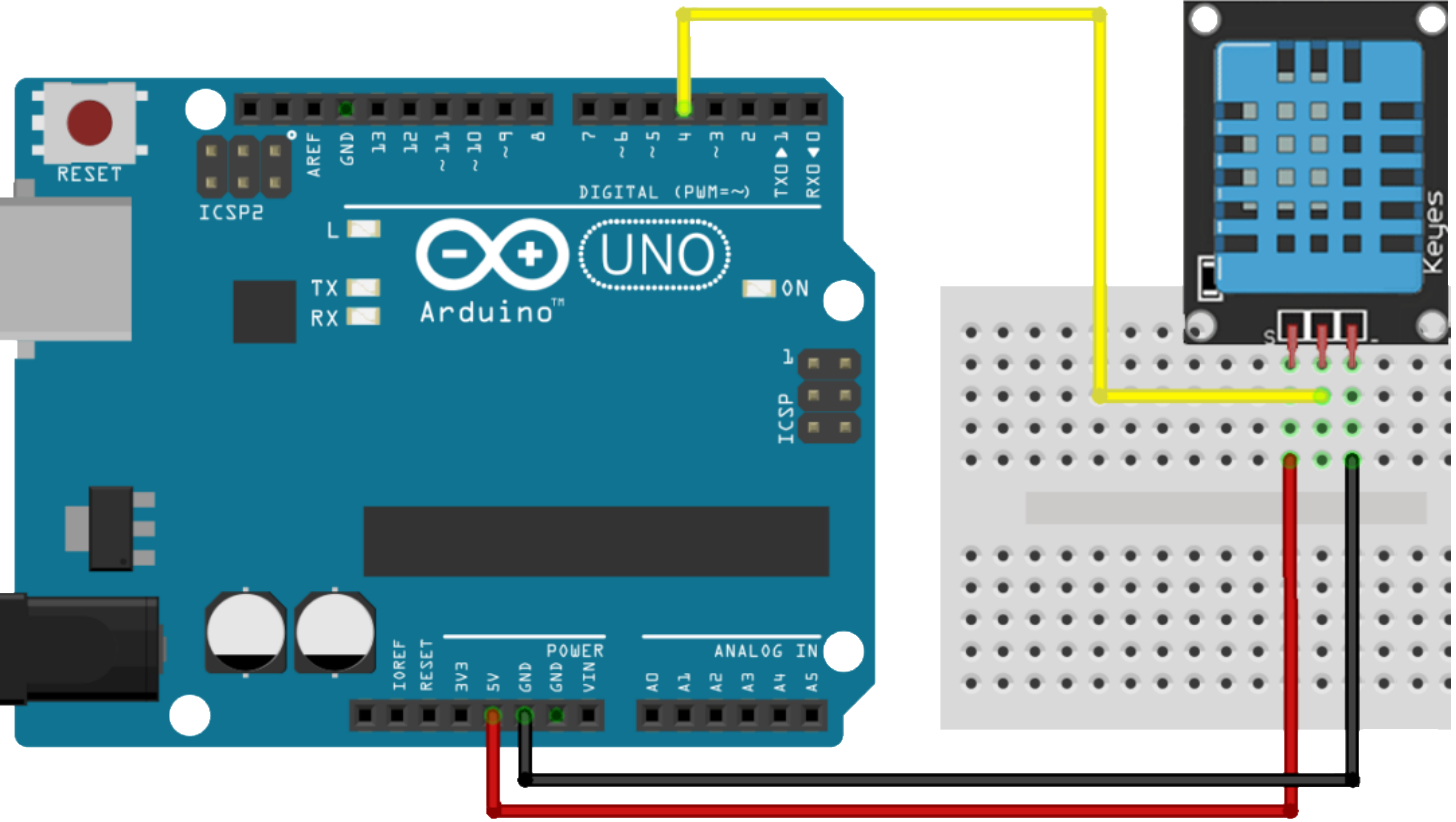
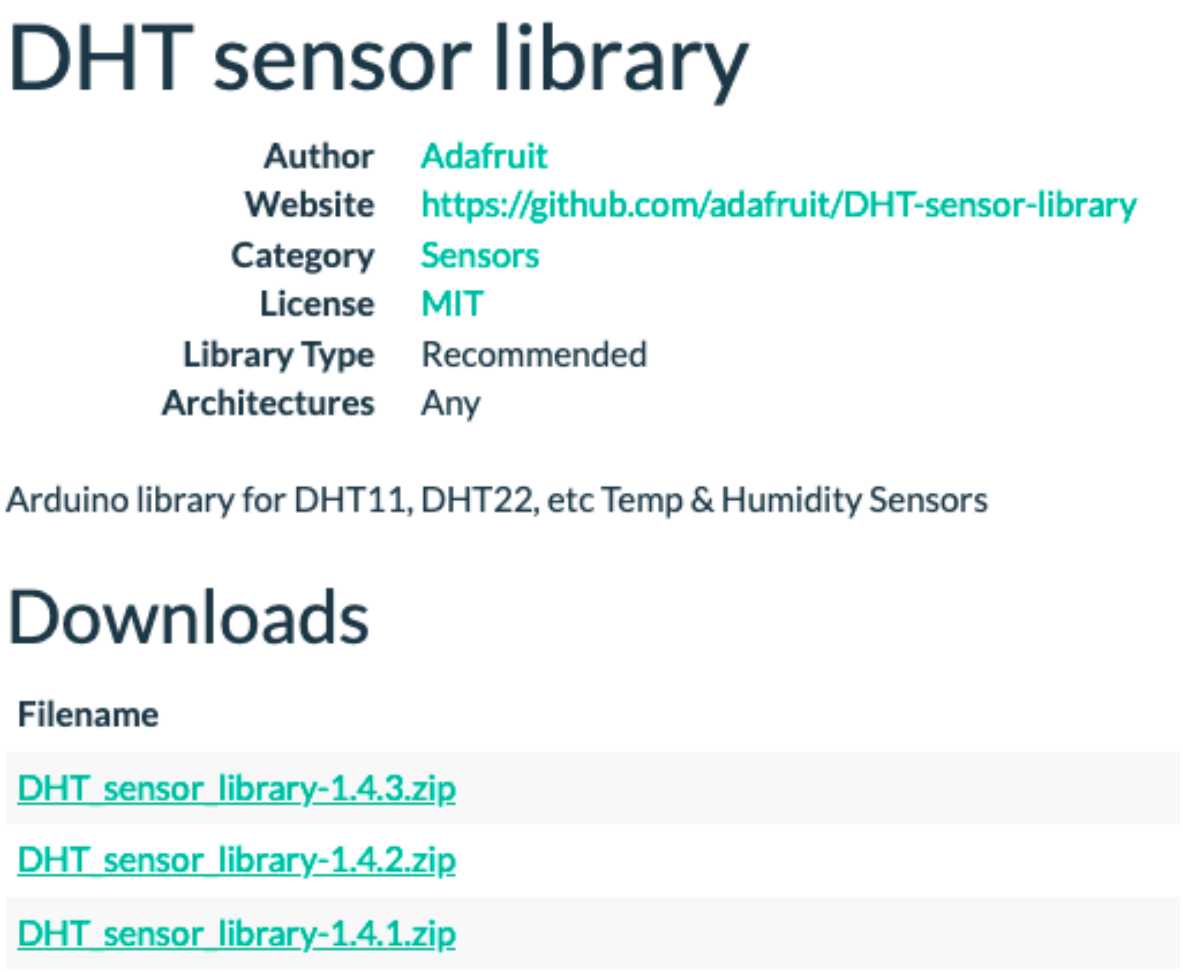


DHT11	Arduino
VCC	5v
GND	GND
DATA	4



DHT sensor library

Author	Adafruit
Website	https://github.com/adafruit/DHT-sensor-library
Category	Sensors
License	MIT
Library Type	Recommended
Architectures	Any

Arduino library for DHT11, DHT22, etc Temp & Humidity Sensors

Downloads

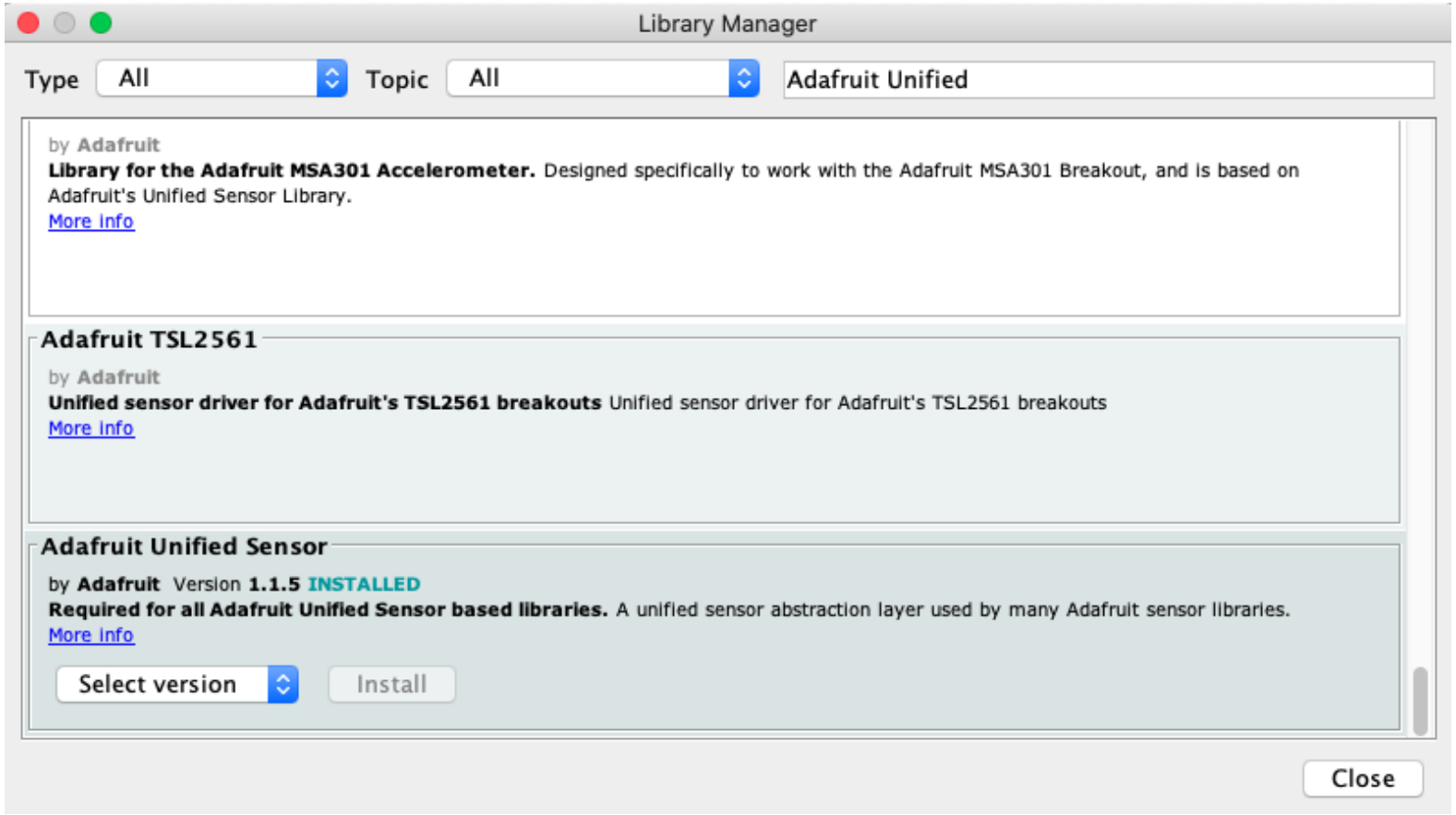
Filename
DHT_sensor_library-1.4.3.zip
DHT_sensor_library-1.4.2.zip
DHT_sensor_library-1.4.1.zip

Install DHT11 sensor library

- Download DHT_sensor_library-x.x.x.zip

- Open Arduino IDE, select **Sketch > Include Library > Add .Zip Library** > select zip file.

Link download:
https://www.arduinolibraries.info/libraries/dht-sensor-library



Install DHT11 sensor library

- Open Arduino IDE, select **Sketch > Include Library > Manage Library**

- Search **“Adafruit Unified Sensor”** > Install

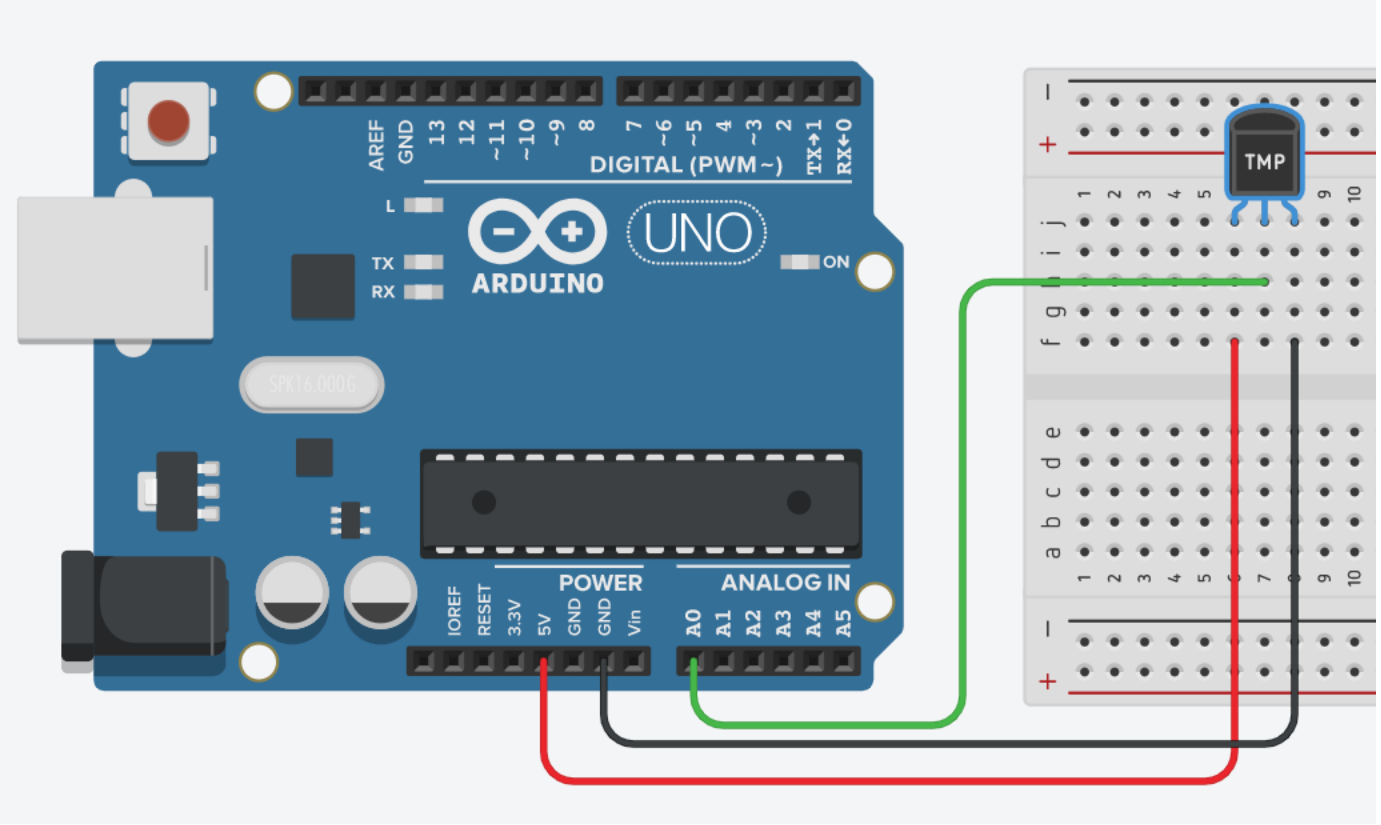
```ino
#include "DHT.h"
int dht_pin = 4;
DHT dht(dht_pin, DHT11);

void setup() {
  Serial.begin(9600);
  dht.begin();
}

void loop() {
  float h = dht.readHumidity();
  float t = dht.readTemperature();      // Read temperature as Celsius
  float f = dht.readTemperature(true);  // Read temperature as Fahrenheit

  Serial.print("Humidity: ");
  Serial.println(h);
  Serial.print("Temperature (C): ");
  Serial.println(t);
  Serial.print("Temperature (F): ");
  Serial.println(f);

  delay(1000);
}
```



Thông số TMP36:

0.01 V = 10mV = 1°C

Điện áp ở 0°C:
0.5V

Điện áp đầu ra (Vout) = (Giá trị analog / 1023) * Điện áp đầu vào
Nhiệt độ (độ C) = ((Vout - Điện áp tương ứng với 0 độ C) / Điện áp mỗi độ C)

celsius =((analog_value / 1023.0) * 5 – 0.5)/0.01

TMP	Arduino
Power	5v
GND	GND
VOUT	A0

```
void setup()
{
  pinMode(A0, INPUT);
  Serial.begin(9600);
}

void loop()
{
  float value = analogRead(A0);
  float celsius = (value * 5 / 1023) / 0.01 - 50;
  Serial.println(celsius);
}
```

Practice