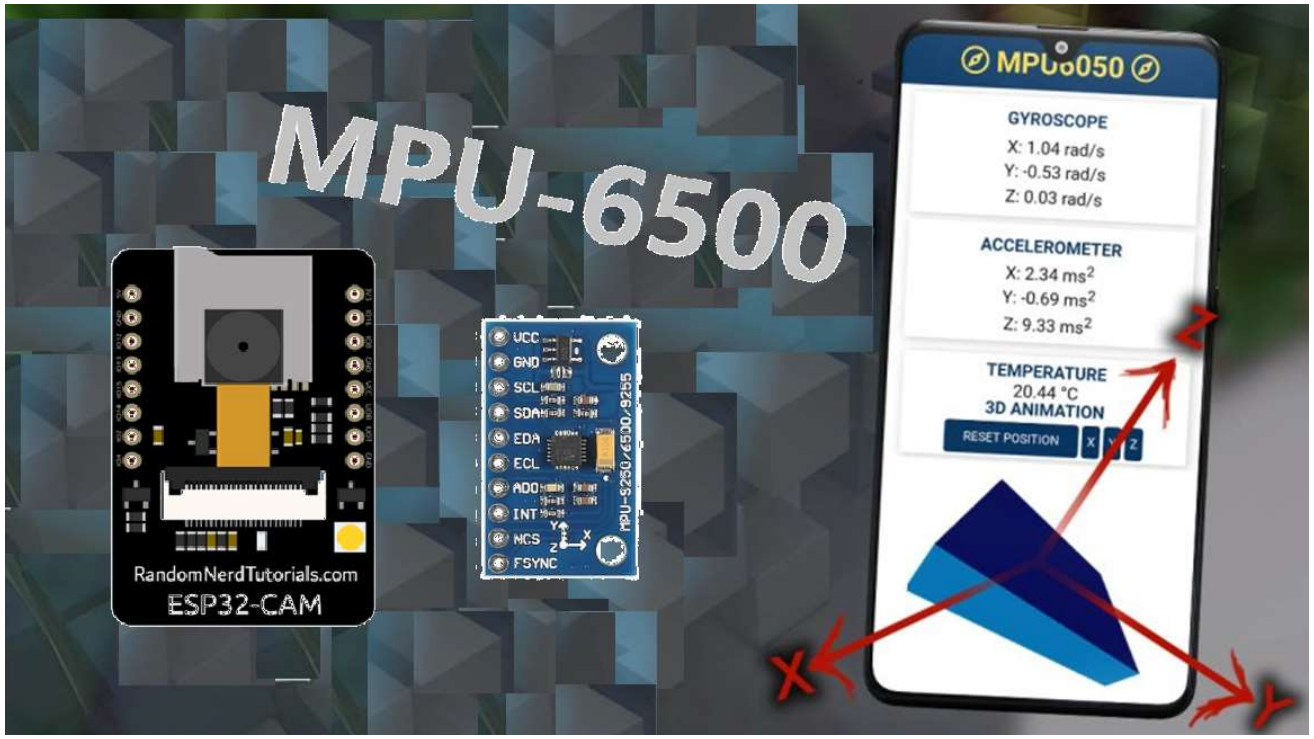
MPU6500 WebServer



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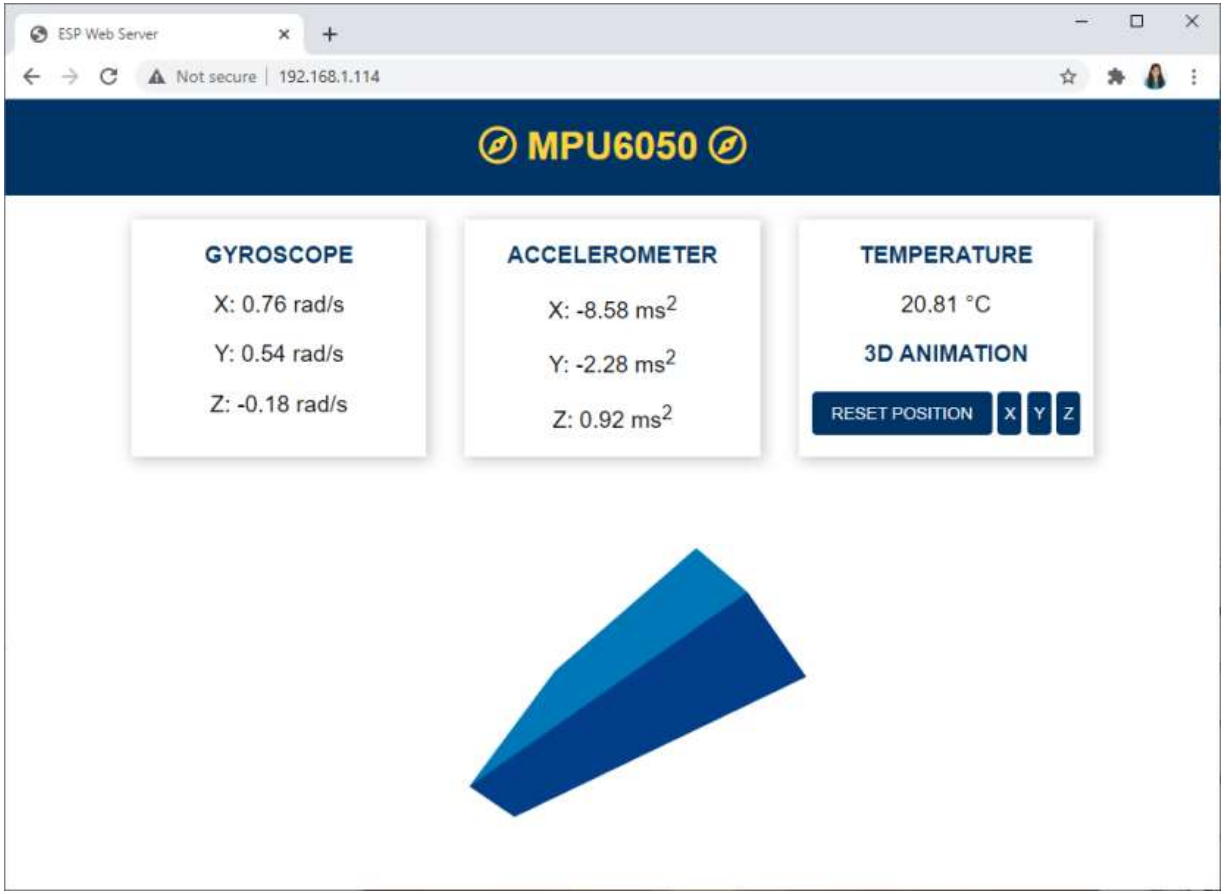
Sangwon Lee

Contents

- ❑ Project Overview
- ❑ Connection between MPU6500 and ESP32-CAM
- ❑ ESP32 File System
- ❑ SPIFFS Uploader Plugin
- ❑ Required Libraries
- ❑ Library and Code Modification
- ❑ Demonstration

- ❑ Reference:
  https://randomnerdtutorials.com/esp32-mpu-6050-web-server/

Project Overview

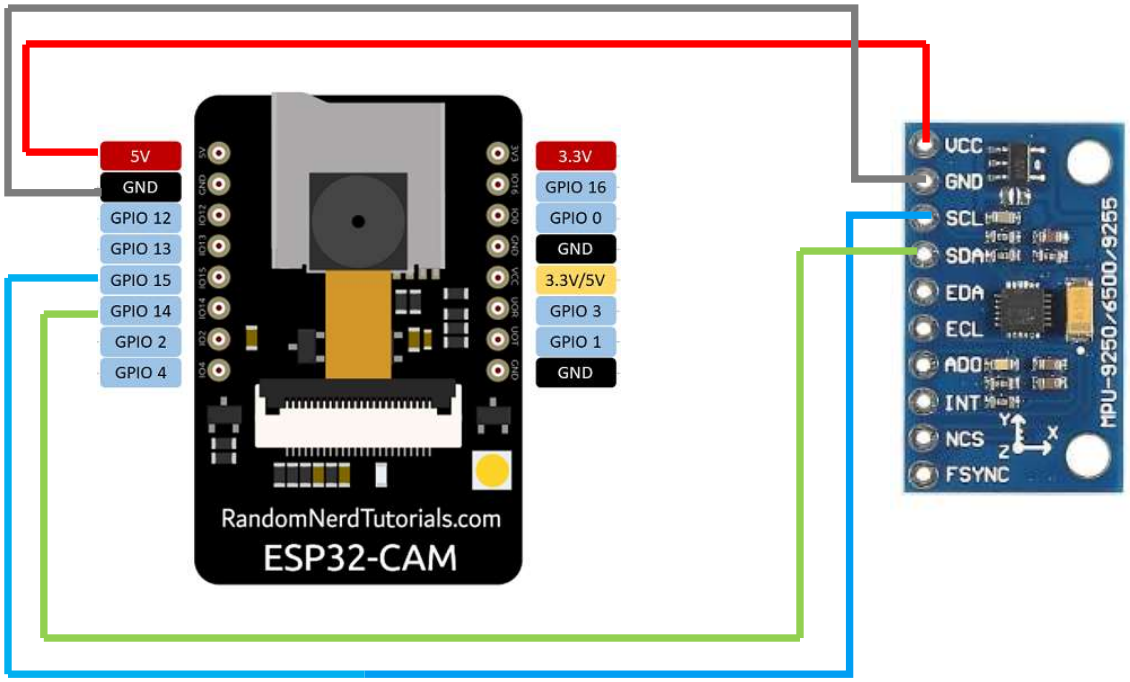


- Accelerometer update period: 200ms
- Gyroscope update period: 10ms
- Temperature update period: 1000ms

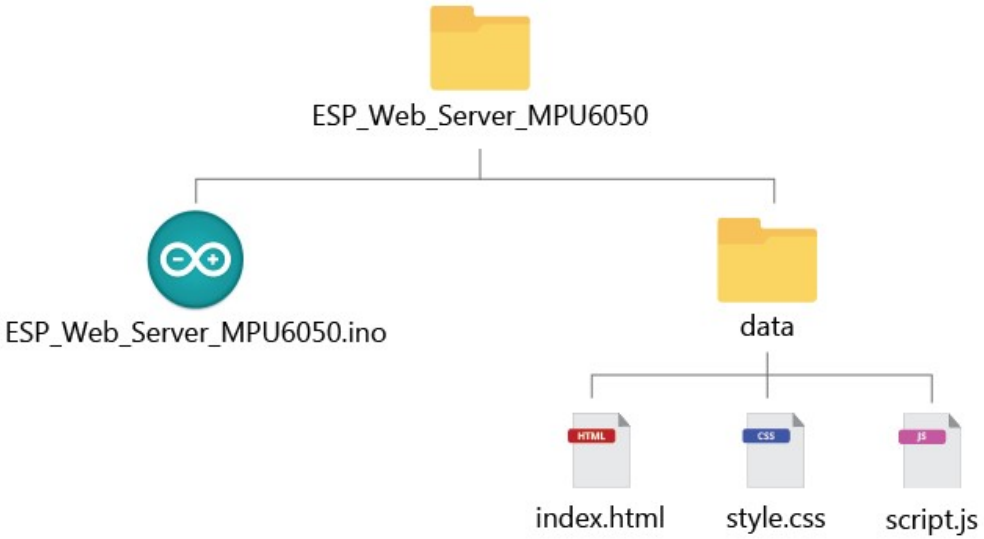
- 3D display using three.js

- Adafruit libraries are required.
- ESP32 filesystem SPIFFS is required.

Connection between ESP32-CAM and MPU6500



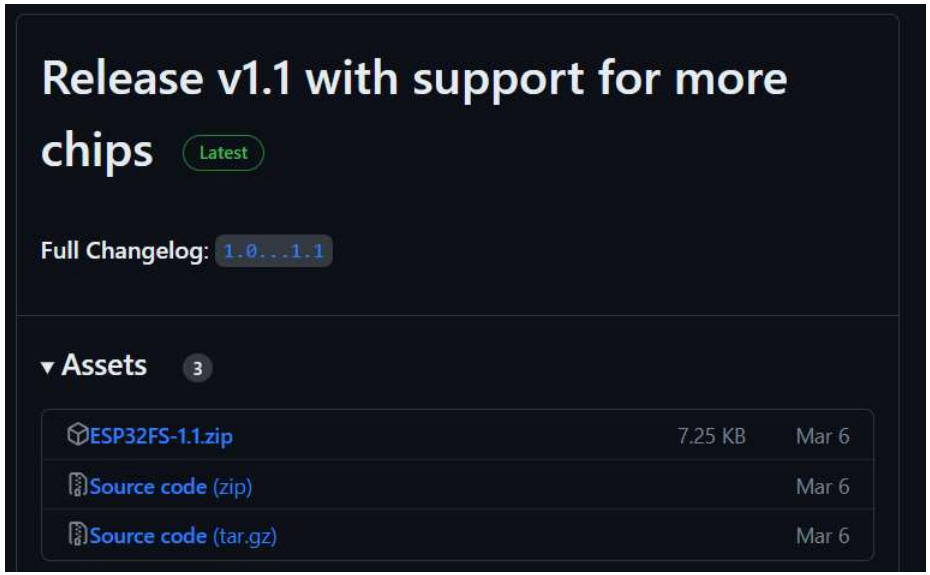
ESP32 File System



- .ino Arduino code controls independent HTML file in data folder
- .html, .css, and .js files are moved to ESP32 SPIFFS file system partition.
- SPIFFS Uploader Plugin is required.

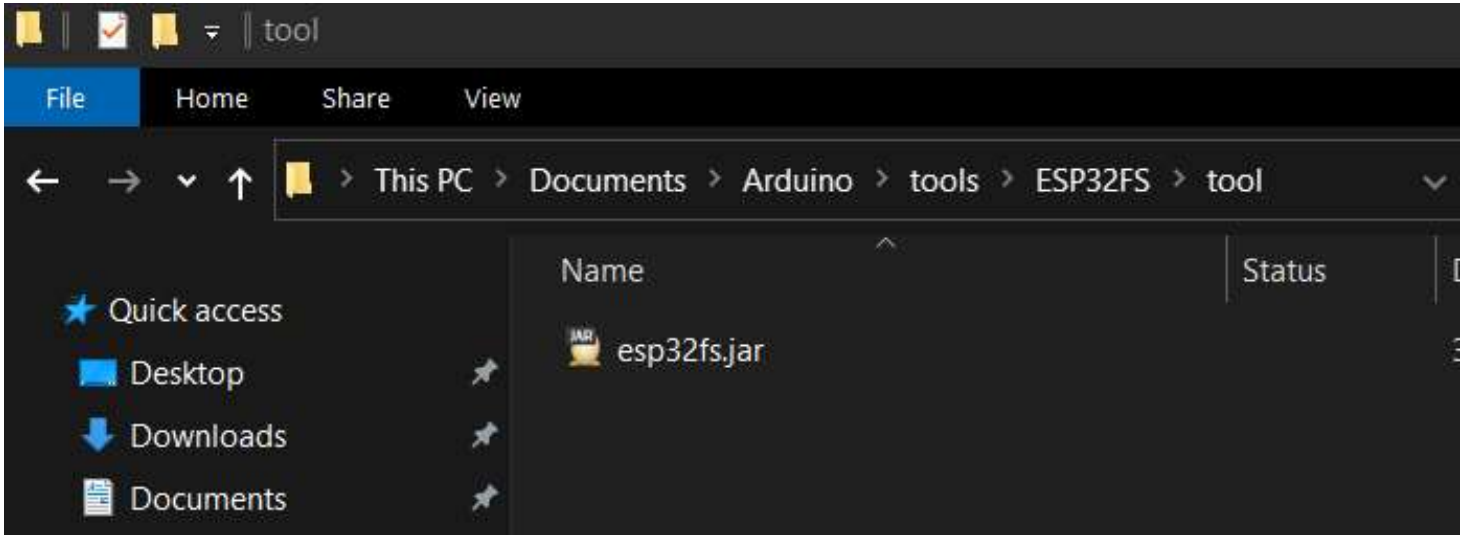
SPIFFS uploader plugin

- Download the esp32 filesystem SPIFFS uploader plugin from “https://github.com/me-no-dev/arduino-esp32fs-plugin/releases/
- And make a new folder, “tools” under your Arduino sketchbook location. (Documents > Arduino > tools)



SPIFFS uploader plugin

- Unzip ESP32FS.zip file
- Esp32fs.jar should be in
  your Arduino sketchbook folder / tools / ESP32FS / tool / esp32fs.jar

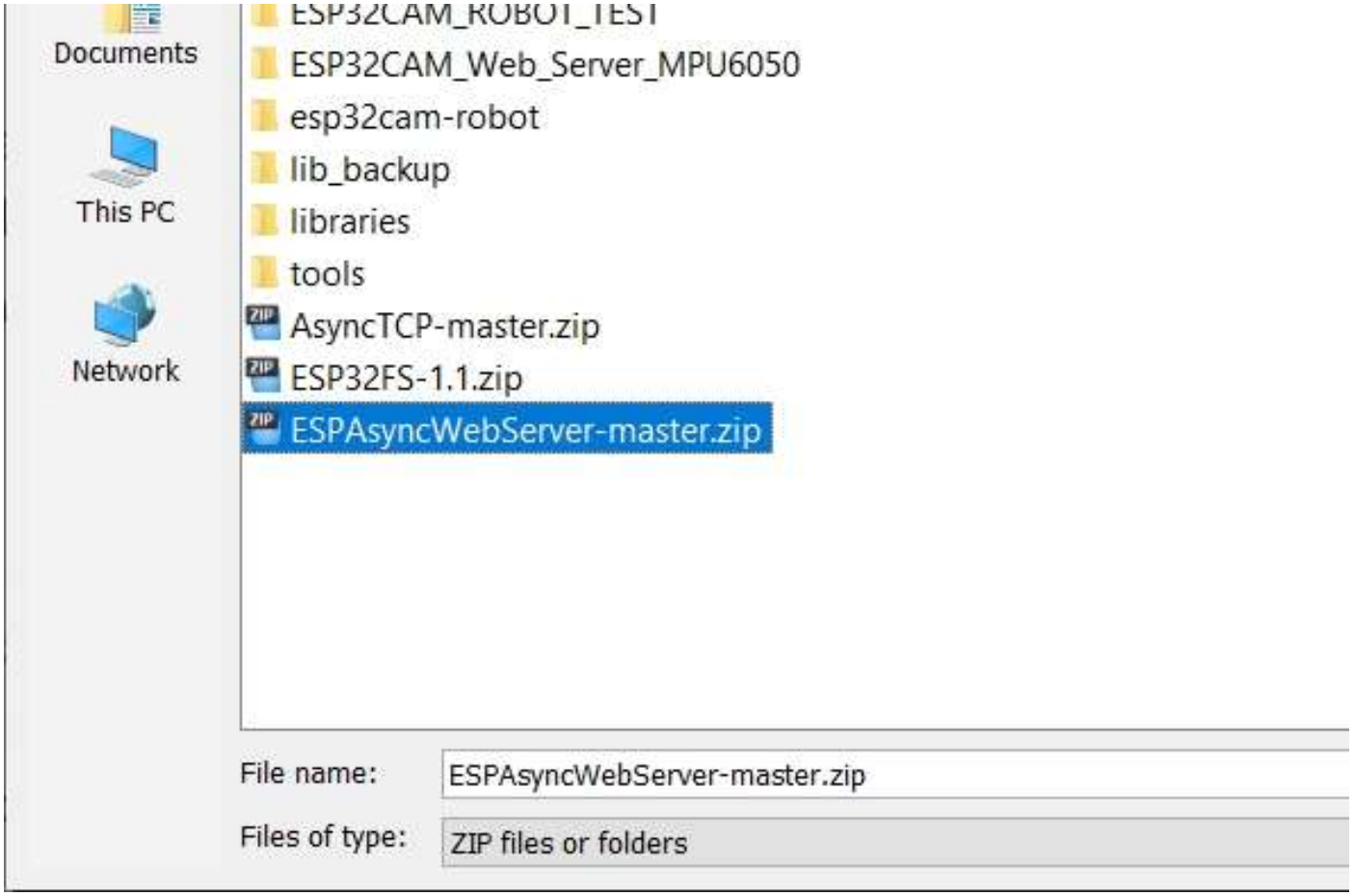


Library Requirements

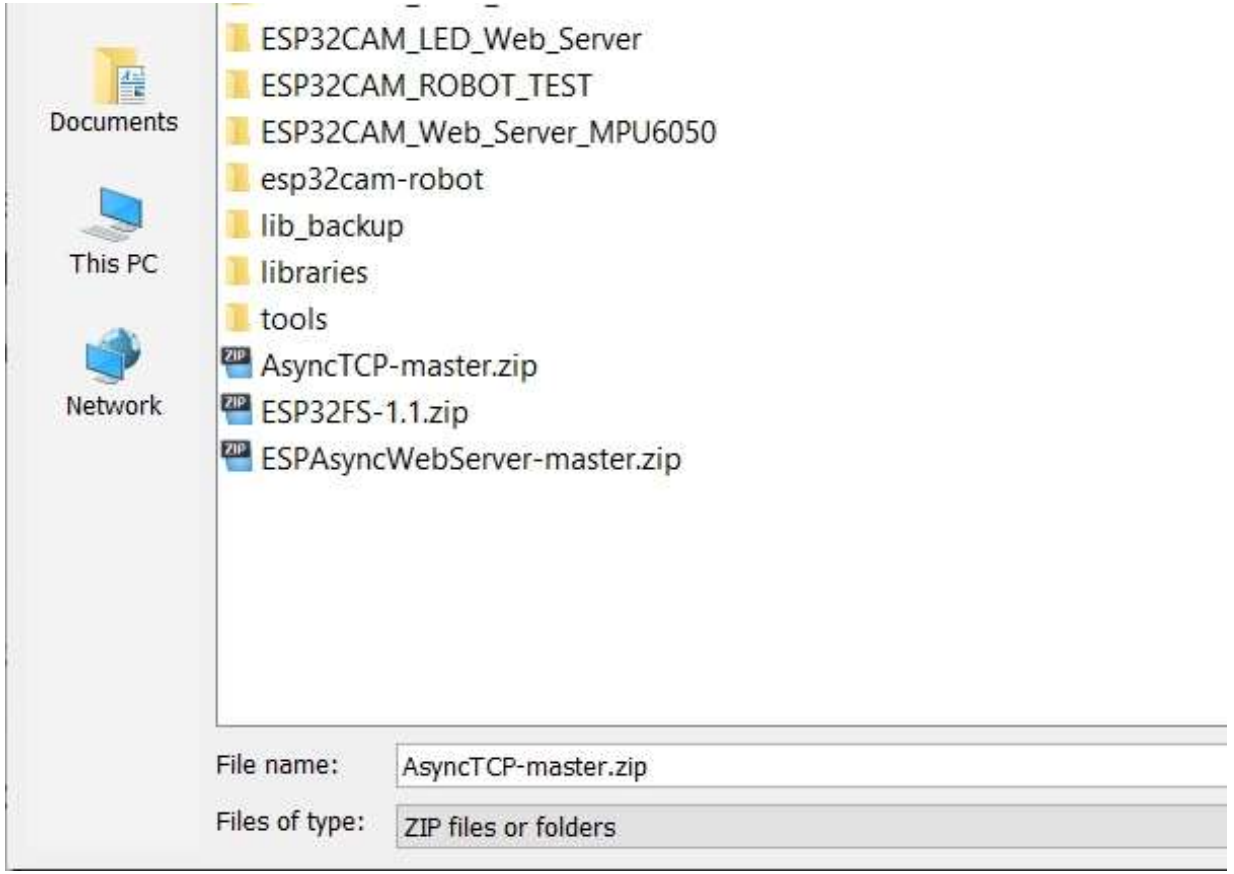
- ESPAsyncWebServer
- AsyncTCP

- Move two .zip files (ESPAsyncWebServer-master.zip , AsyncTCP-master.zip) to ‘Documents>Arduino’ folder
- Go to ‘Sketch > Include Library > Add .zip Library’
- Install two libraries independently.

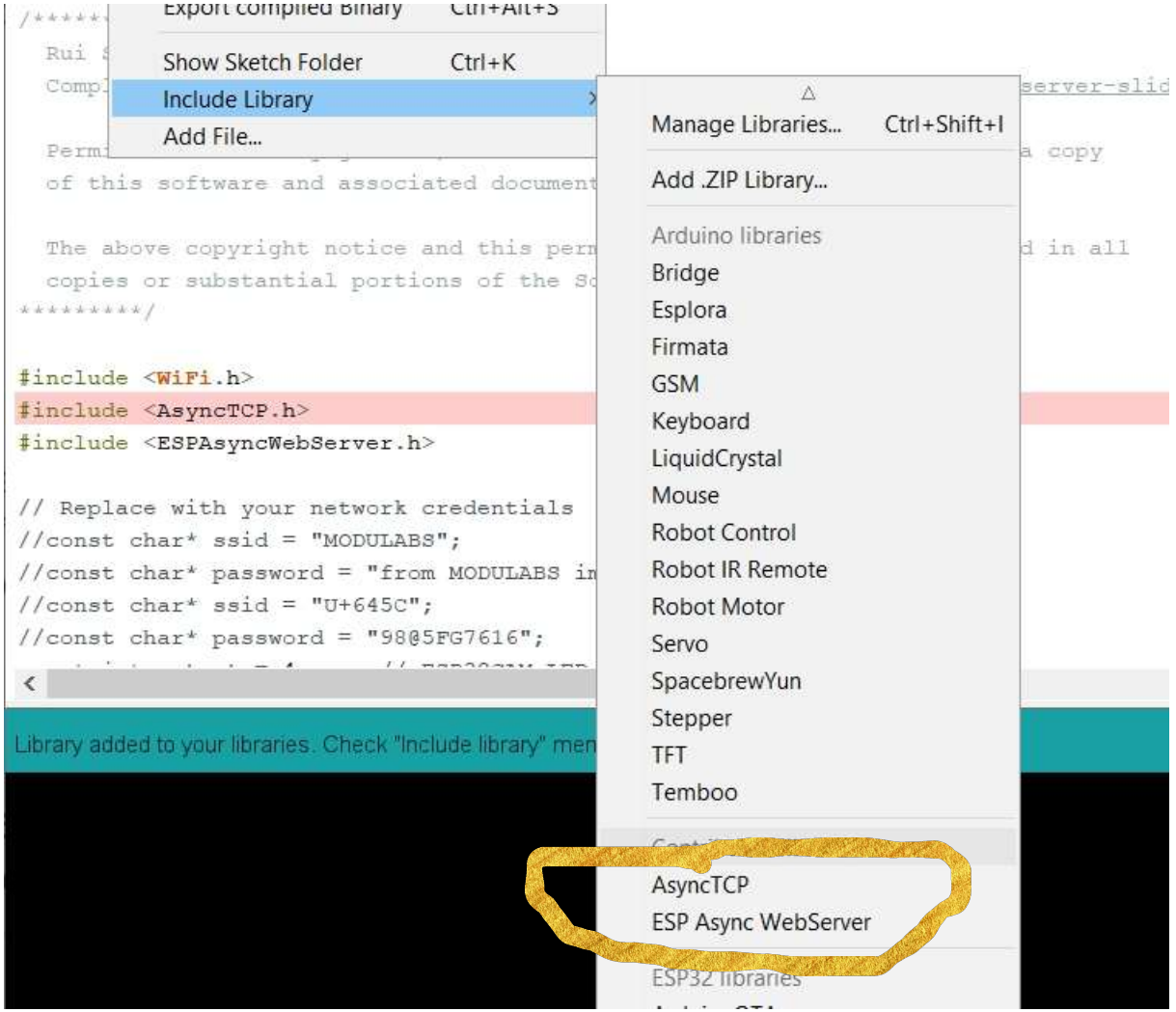
Library Requirements



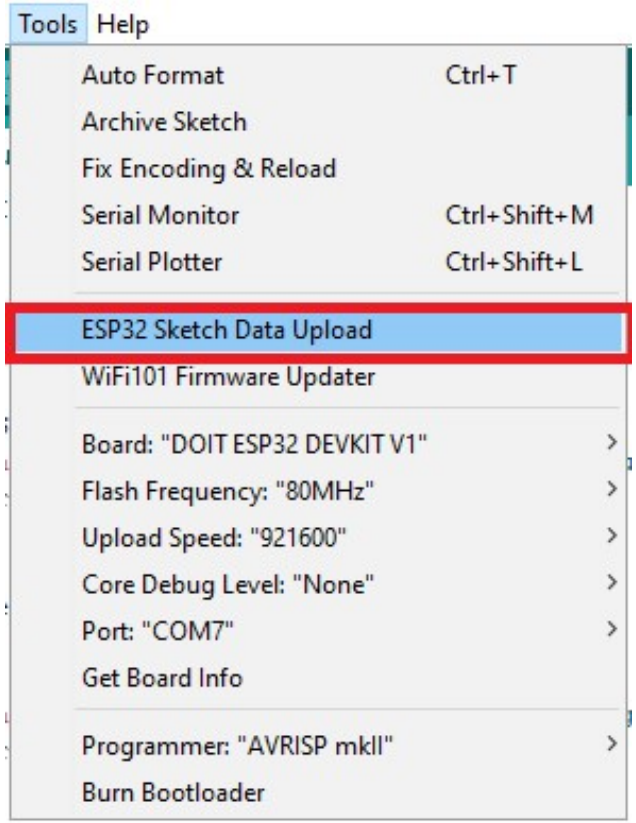
Library Requirements



Library Requirements



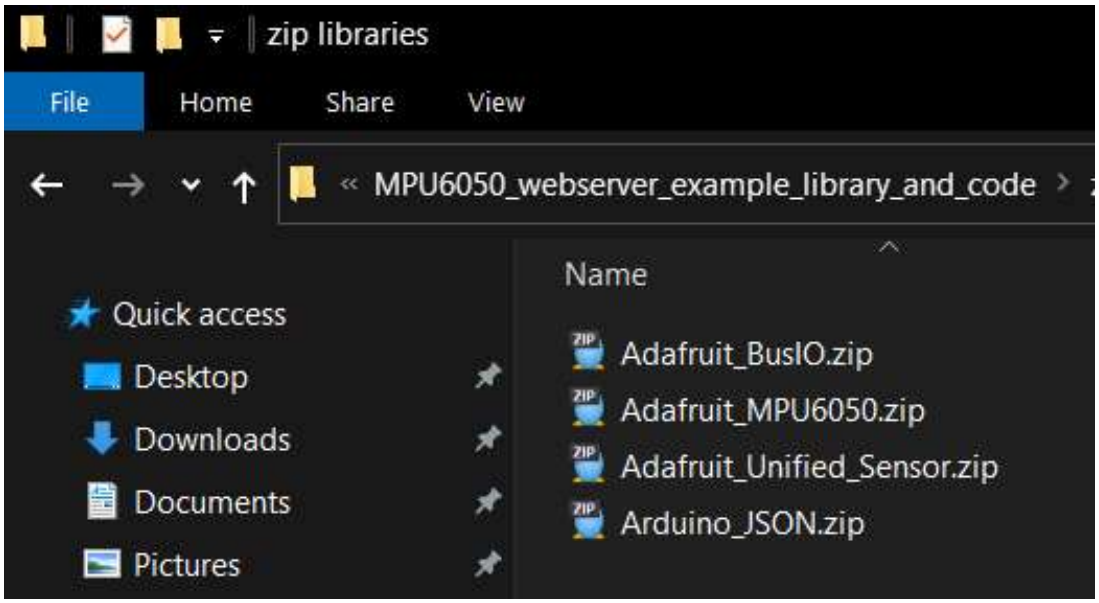
SPIFFS uploader plugin



- At Arduino Tools, you will see “ESP32 Sketch Data Upload
- If you click this feature, all files in “data” folder will be uploaded to SPIFFS partition in ESP32.

Required Libraries

Add all required .zip libraries



- Adafruit_BUSIO.zip
- Adafruit_MPU6050.zip
- Adafruit_Unified_Sensor.zip
- Arduino_JSON.zip

❑ Reference:
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Library and Code Modification for ESP32-CAM

- **Make TwoWire Object to change I2C pins**

```
40 unsigned long accelerometerDelay = 250;
41
42 // Create a sensor object
43 #define I2C_SDA 15
44 #define I2C_SCL 14
45 #define I2C_Freq 100000
46
47 TwoWire I2C_MPU6500 = TwoWire(0);
48 Adafruit_MPU6050 mpu;
49
50 sensors_event_t a, g, temp;
51
52 float gyroX, gyroY, gyroZ;
53 float accX, accY, accZ;
54 float temperature;
```

Library and Code Modification for ESP32-CAM

- **I2C begin with TwoWire Object to change I2C pins**
- **Then, I2C begin with Adafruit_MPU6050 objec**

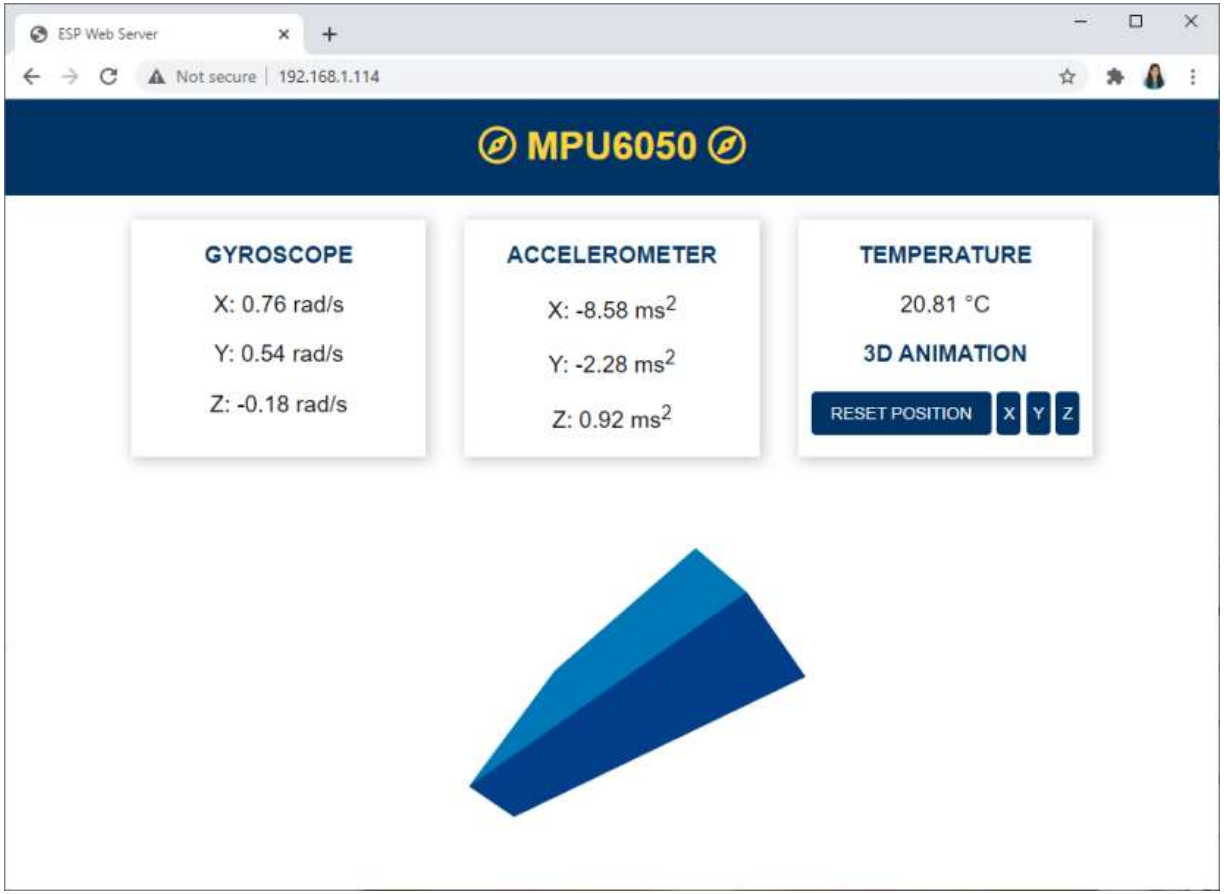
```
61 // Init MPU6050
62 void initMPU(){
63
64   I2C_MPU6500.begin(I2C_SDA, I2C_SCL, I2C_Freq);
65
66   if (!mpu.begin(0x68,&I2C_MPU6500,1)) {
67     Serial.println("Failed to find MPU6050 chip");
68     while (1) {
69       delay(100);
70     }
71   }
```

Library and Code Modification for ESP32-CAM

- **WHOAMI check function does not allow using other MPUxxxx chip.**
- **I add other IC's device ID for using MPU6500.**

```
90   // 2023. AUG. 25
91   // to use MPU6500 6500copy and 9250
92   // add more chip_id check processes
93
94   if (chip_id.read() != MPU6050_DEVICE_ID) {
95
96     if(chip_id.read() != MPU6500_DEVICE_ID){
97
98       if(chip_id.read() != MPU65XX_DEVICE_ID){
99
100        if(chip_id.read() != MPU9250_DEVICE_ID){
101          return false;
102        }
103      }
104    }
105  }
```

Demonstration



Thank you