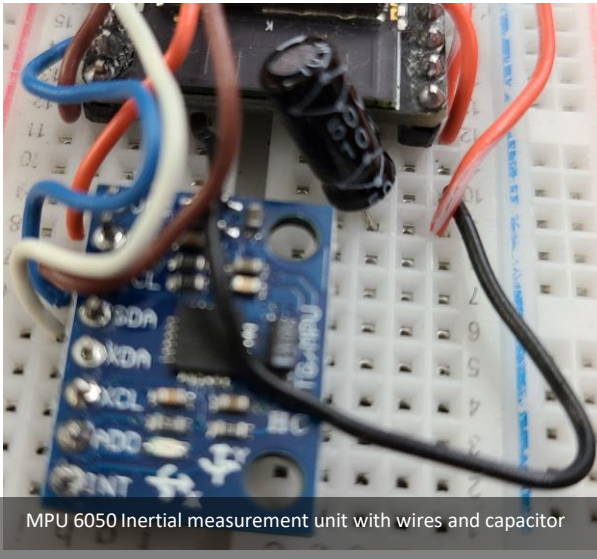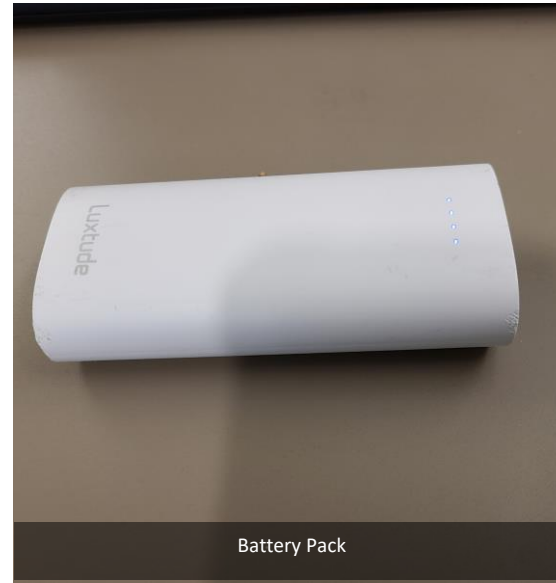# Rover Tracker

By: Dov Cattan
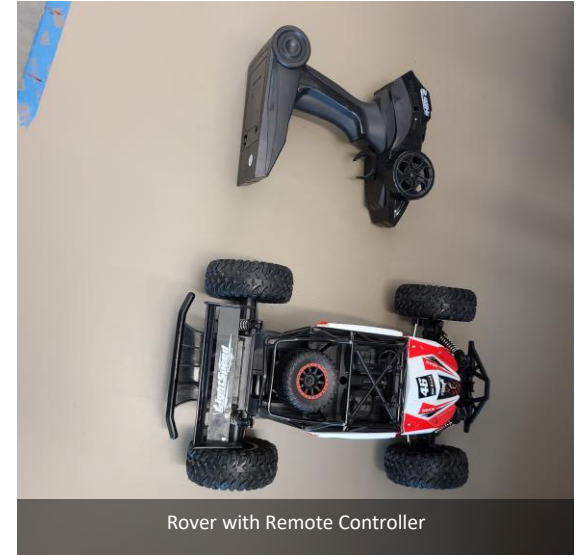
MPU 6050 Inertial measurement unit with wires and capacitor


ESP 32 Microcontroller

Battery Pack

Rover with Remote Controller

Parts

MPU 6050 IMU

- Inertial Measurement Unit Includes Gyroscope, Accelerometer, and Temperature Sensor

- Those reading mentioned are displayed to the web server once connected to the ESP 32 MCU

- Pins are soldered in order for the sensor to fit into the breadboard

- Sensors like these are used in spacecraft to determine a satellite or shuttle's rotation acceleration and temperature
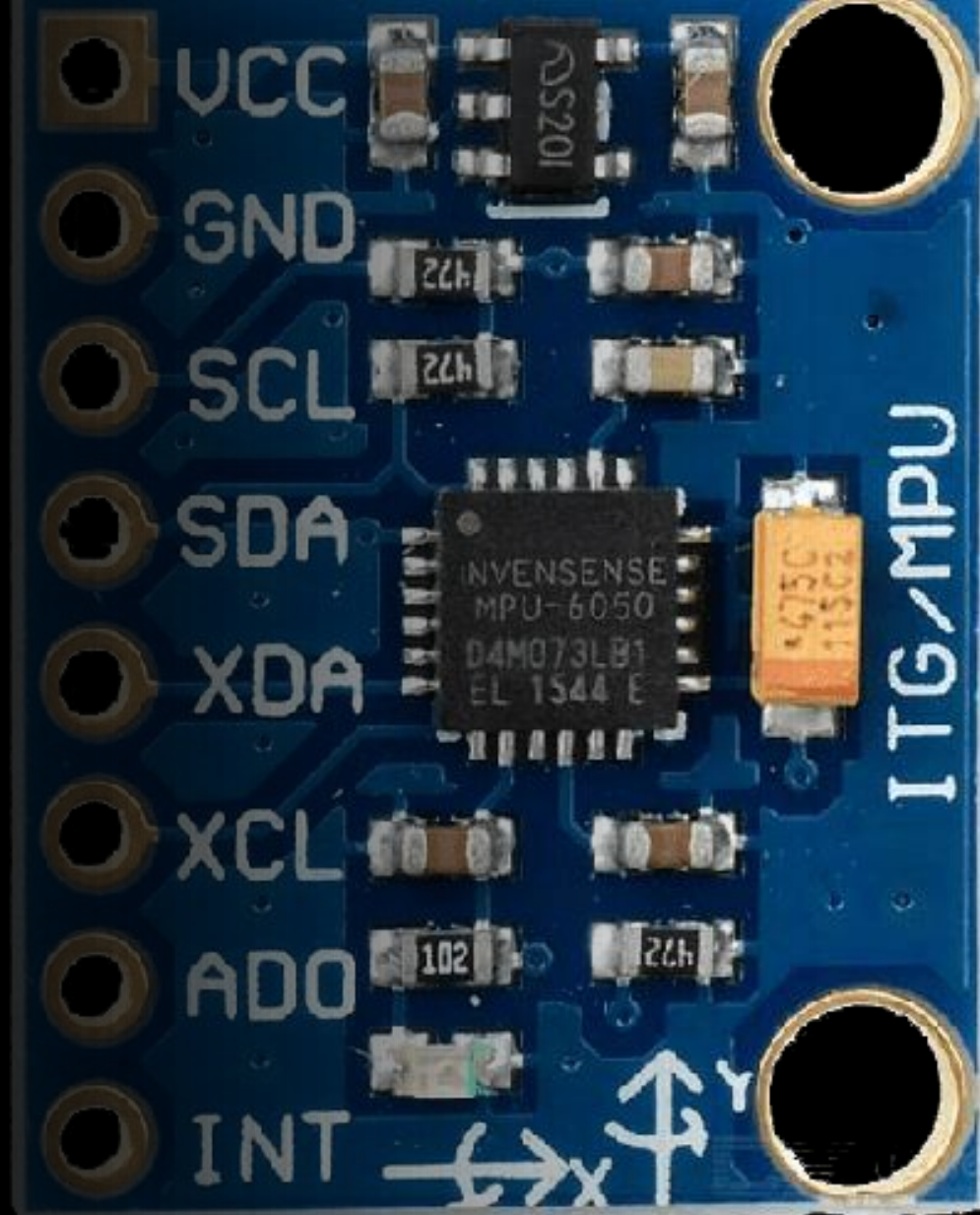
ESP 32 NODEMCU 32S MCU

- 38 pins

- 2 ports connected to the IMU sensor

- 1 port used for 3.3V Power, 1 port used for ground

- 1 capacitor connected to its enable and ground for it to operate it's Wi-fi independently

- Built in Wi-fi sensor used to implement the web server with the Arduino IDE and it's serial monitor

- Can operate while connected to a computer or a battery pack with it's Micro-USB
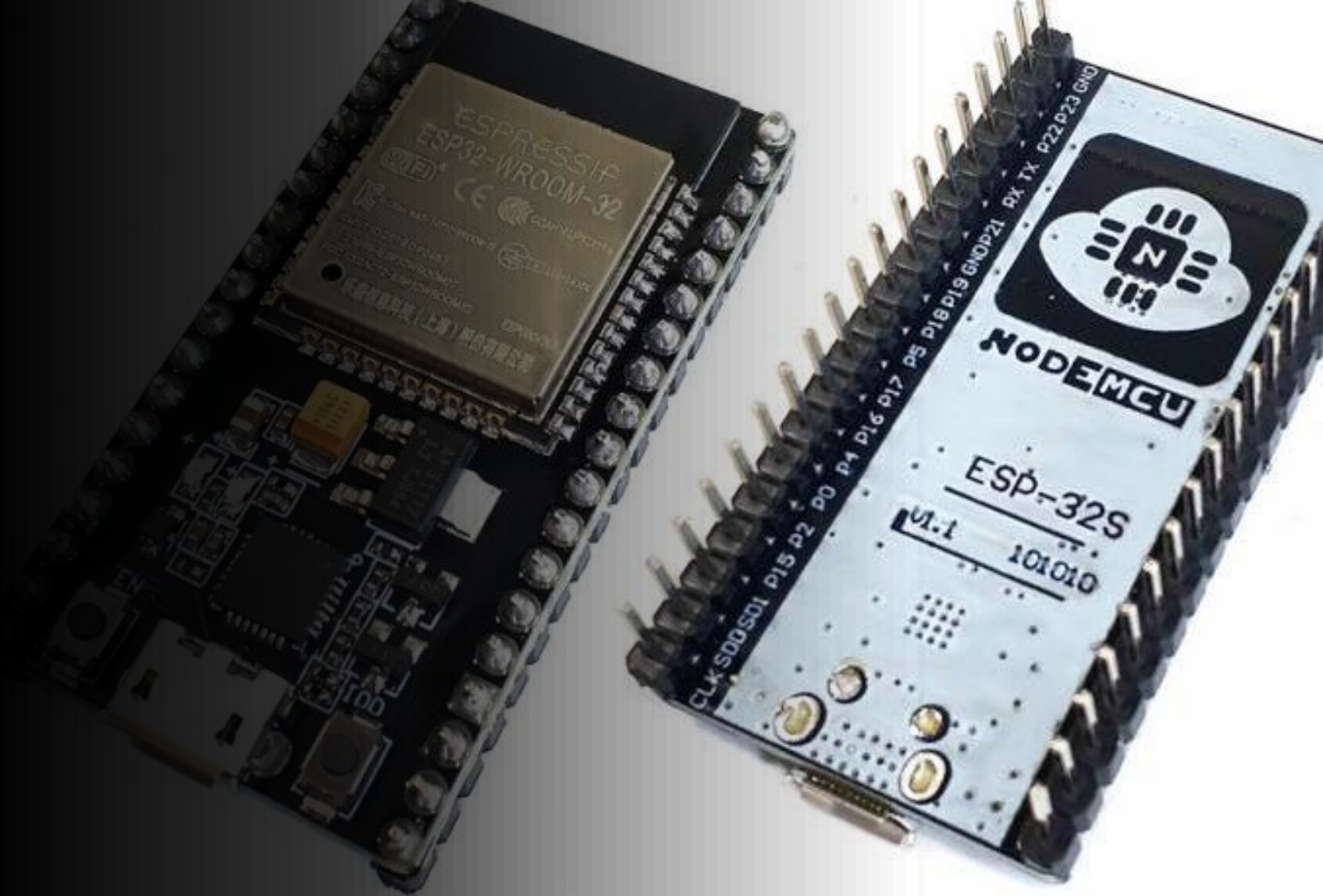
Rover

Ran on rechargeable batteries for the rover and alkaline for the remote controller
Remote controller used to steer, accelerate forward/backward, and decelerate the rover

Web Server accessed by IP address

- Coded in HTML, CSS, and JavaScript
- Uploaded and integrated with Arduino code to host the server
- Accessed by the IP address the Wi-Fi wants using the serial monitor to find it
- Gyroscope readings displayed in degrees, accelerometer reading displayed in meters squared per seconds, temperature readings of the system tracked in Fahrenheit


```
of this software and associated documentation files.

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copies or substantial portions of the Softwar...
*********/

#include <Arduino.h>
#include <WiFi.h>
#include <AsyncTCP.h>
#include <ESPAsyncWebServer.h>
#include <Adafruit_MPU6050.h>
#include <Adafruit_Sensor.h>
#include <Arduino_JSON.h>
#include "SPIFFS.h"

// Replace with your network credentials
const char* ssid = "fau";
const char* password = "";

// Create AsyncWebServer object on port 80
AsyncWebServer server(80);

// Create an Event Source on /events
AsyncEventSource events("/events");
```
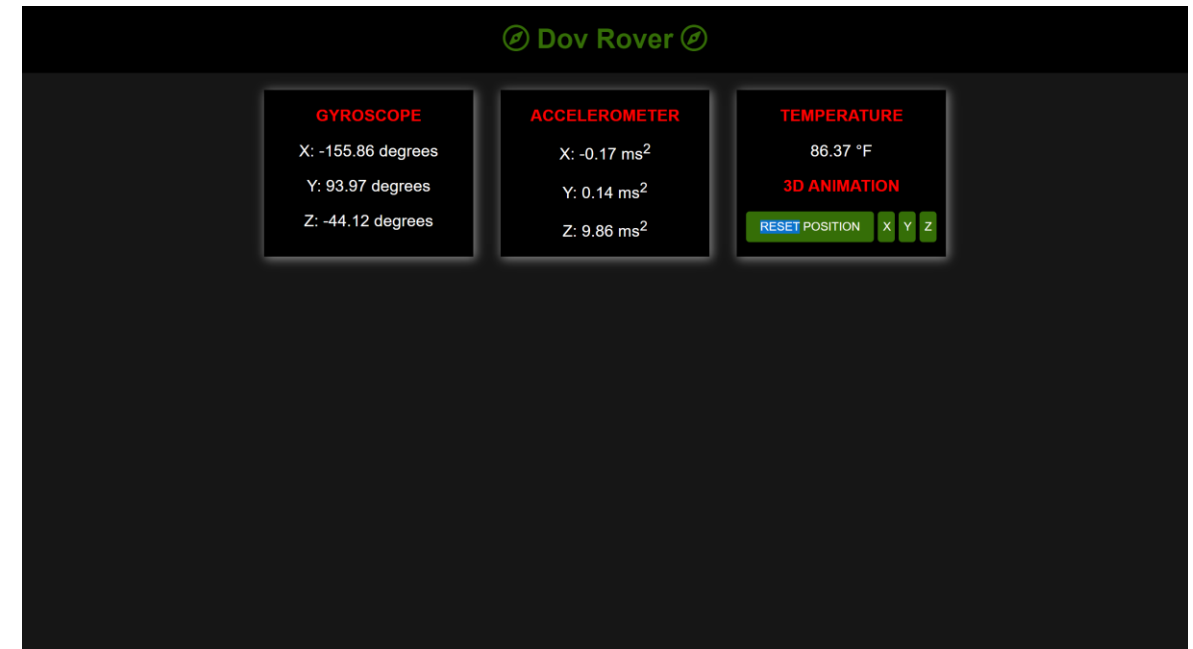
```
COM5

ets Jun  8 2016 00:22:57

rst:0x1 (POWERON_RESET),boot:0x13 (SPI_FAST_FLASH_BOOT)
configsip: 0, SPIWP:0xee
clk_drv:0x00,q_drv:0x00,d_drv:0x00,cs0_drv:0x00,hd_drv:0x00,wp_drv:0x00
mode:DIO, clock div:1
load:0x3fff0018,len:4
load:0x3fff001c,len:1044
load:0x40078000,len:10124
load:0x40080400,len:5856
entry 0x400806a8

Connecting to WiFi......
10.12.9.206
SPIFFS mounted successfully
MPU6050 Found!
```

Dov Rover

GYROSCOPE
X: -155.86 degrees
Y: 93.97 degrees
Z: -44.12 degrees

ACCELEROMETER
X: -0.17 ms^2
Y: 0.14 ms^2
Z: 9.86 ms^2

TEMPERATURE
86.37 °F

3D ANIMATION
RESET POSITION X Y Z

Summary

- IMU sensor tracks the rotation, speed and temperature

- ESP 32 Used to operate the tracker

- The tracker is tested on the rover

- The tracker uses a battery pack to power it

- The web server displays the tracker's readings that was placed on the rover, and is accessible online with the MCU's IP Address

THE END