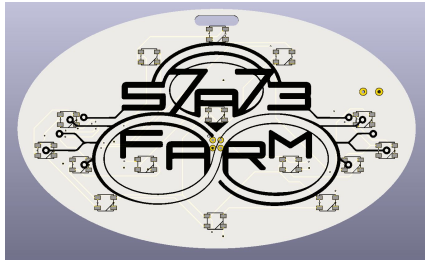
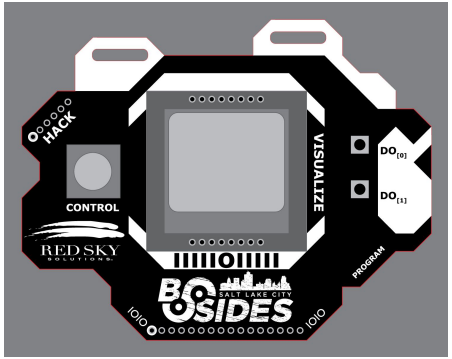
I've got an electronic conference badge, now what?

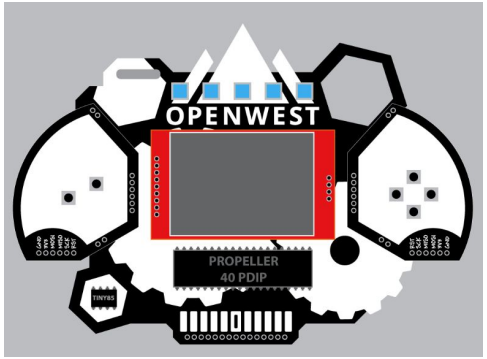
By @compukidmike

Michael Whiteley - @compukidmike

- Husband, father of 3
- Electrical Engineer
- Sysadmin
- Defcon Black Badge
- Badgemaker

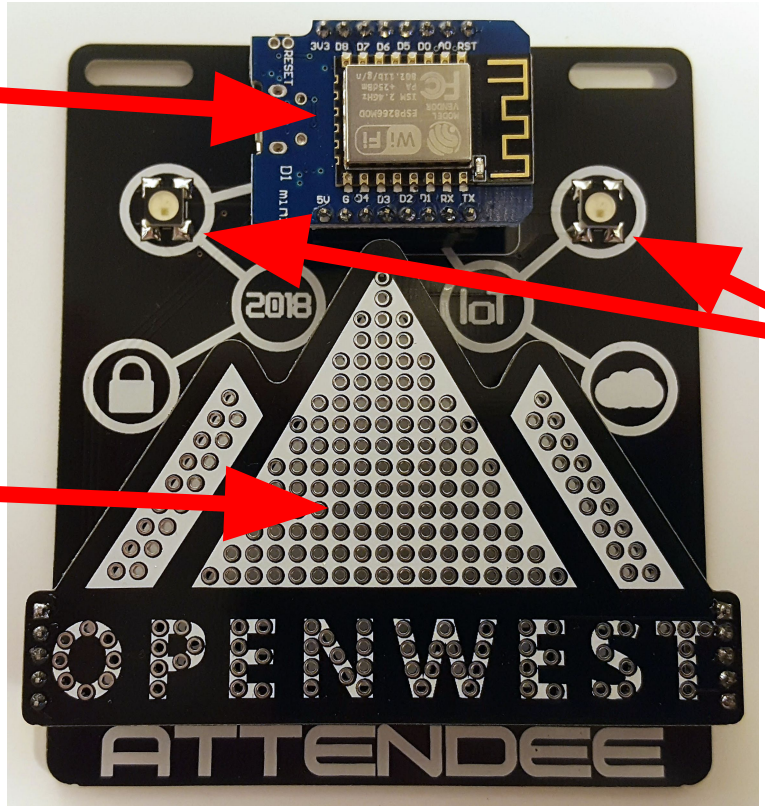






Badge Features

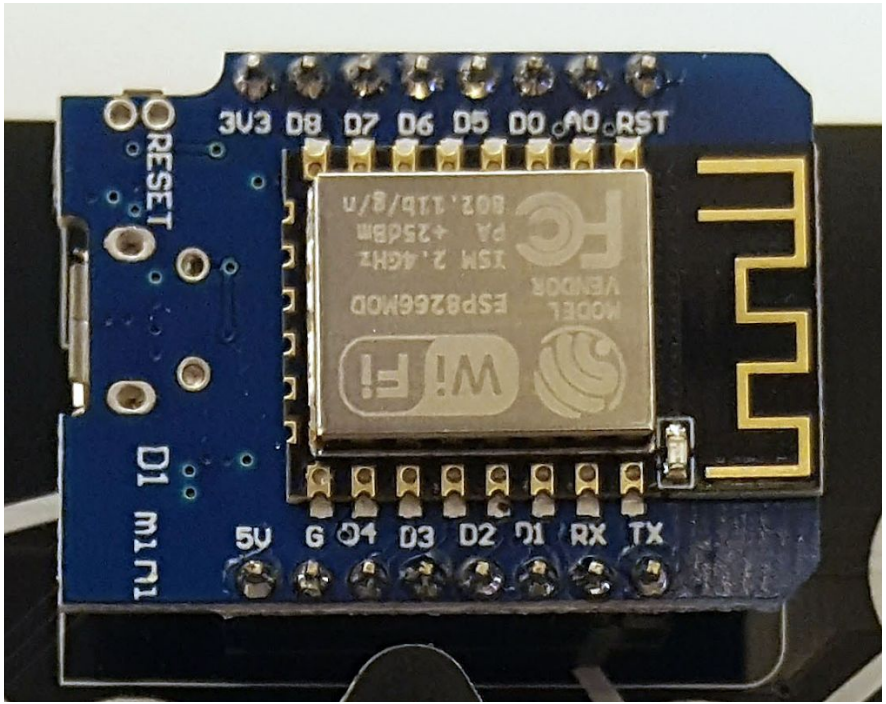
WiFi Module



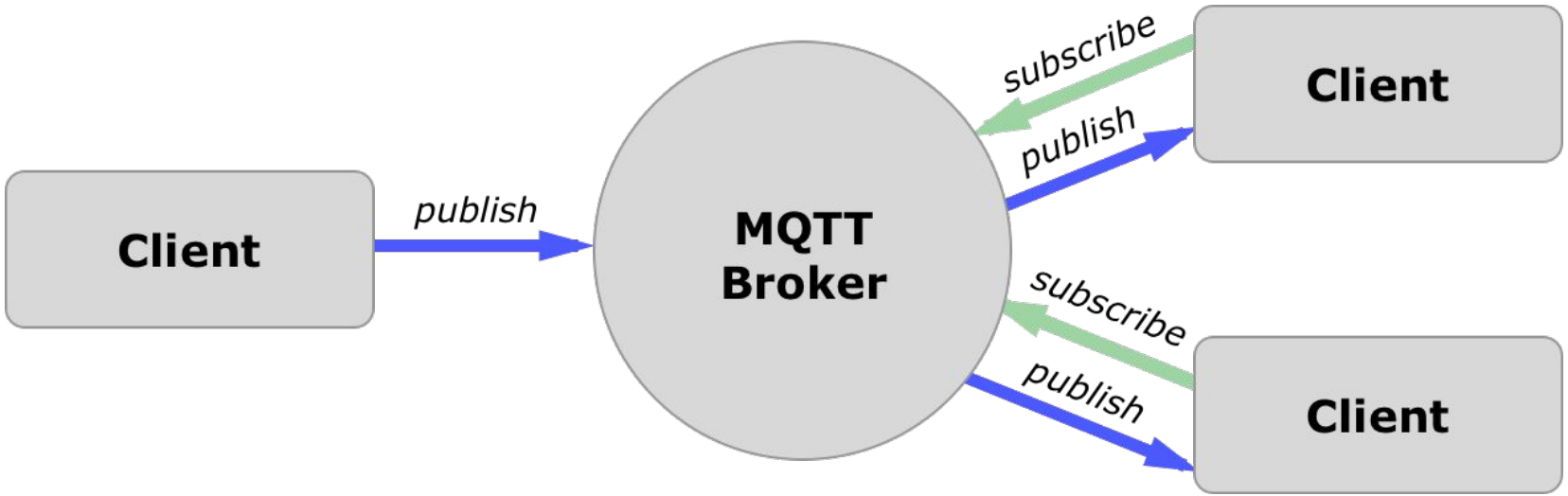
RGB LEDs

Prototyping Area

WeMos D1 Mini - ESP8266



Controlling the badge - MQTT



MQTT Feeds

Feed names: color1, color2, effect, effectspeed

Colors are in Hex format (FFFFFF)

Effectspeed is 0-255

Effect is 0-6 (Off, On, Blink, Pulse, Alternate1, Alternate2, Rainbow)

Must set retain flag on messages

Battery Power

WiFi is power hungry. So are LEDs.

Average 75mA to keep connected.

Sleep modes are your friend.

Deep sleep less than 1mA (requires jumper).

Or use USB power and don’t worry about it :)

Arduino vs NodeMCU

NodeMCU has stability issues and requires rebuilding the core to add functionality. Scripts are written in Lua.

Arduino is stable and opens access to many community libraries.

Both require software to reprogram.

It really comes down to personal preference.

Arduino - Change WiFi Settings

```
/************************* WiFi Access Point *********************************/
// Change these to your personal wifi

#define WLAN_SSID       "OPENWEST-GUEST"
#define WLAN_PASS       "Openwest2018!"

/************************* Adafruit.io Setup *********************************/
// you need to create an account at adafruit.io to use their server

#define AIO_SERVER      "10.155.0.214"          // IP or URL for MQTT server
#define AIO_SERVERPORT  1883                    // use 8883 for SSL
#define AIO_USERNAME    "test"                  // Adafruit.io username
#define AIO_KEY         "1234567890"            // Adafruit.io key
```

Adafruit.io

- Gives you a nice web interface for talking to your IoT devices.
- Free for small projects
- (30 messages/minute, 5 feed limit)
- Use triggers for doing things

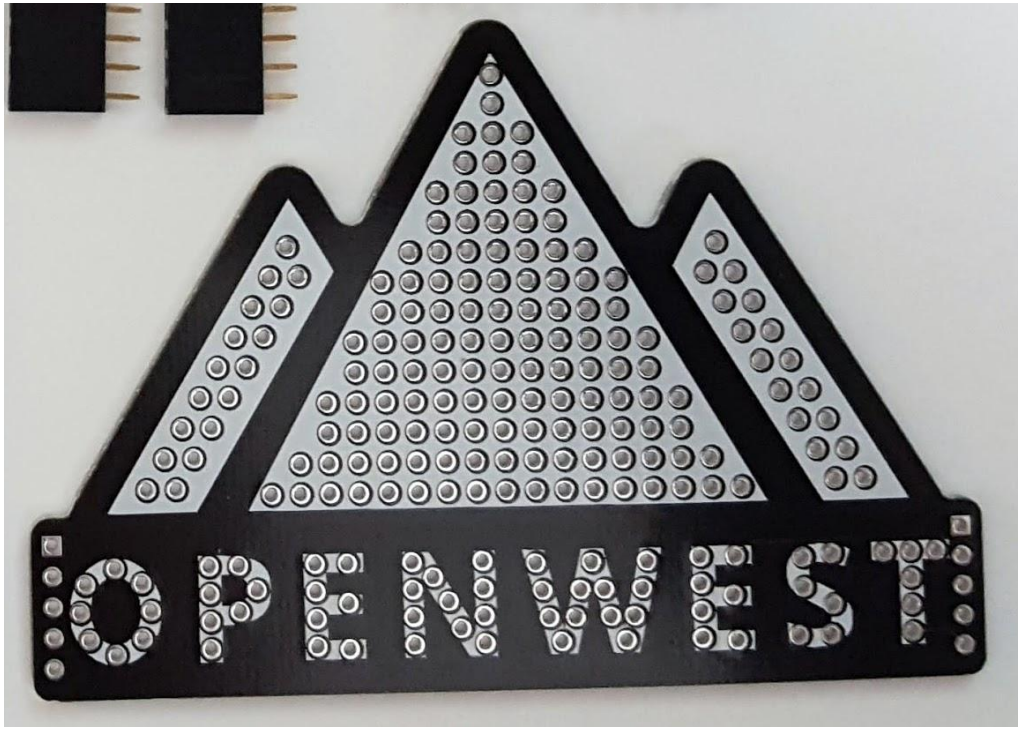
Arduino - Change MQTT Feeds

```
/************************** Feeds *****************************************/

// Setup a feed called 'photocell' for publishing.
// Notice MQTT paths for AIO follow the form: <username>/feeds/<feedname>
//Adafruit_MQTT_Publish photocell = Adafruit_MQTT_Publish(&mqtt, AIO_USERNAME "/feeds/photocell");

// Setup a feeds for subscribing to changes. Set QoS to 1 to make sure you get messages at least once.
// You can add your own feeds here. You need to add a check to the main loop below to handle your feed data.
Adafruit_MQTT_Subscribe color1 = Adafruit_MQTT_Subscribe(&mqtt, "feeds/color1",1);
Adafruit_MQTT_Subscribe color2 = Adafruit_MQTT_Subscribe(&mqtt, "feeds/color2",1);
Adafruit_MQTT_Subscribe effect = Adafruit_MQTT_Subscribe(&mqtt, "feeds/effect",1);
Adafruit_MQTT_Subscribe effectspeed = Adafruit_MQTT_Subscribe(&mqtt, "feeds/effectspeed",1);
```

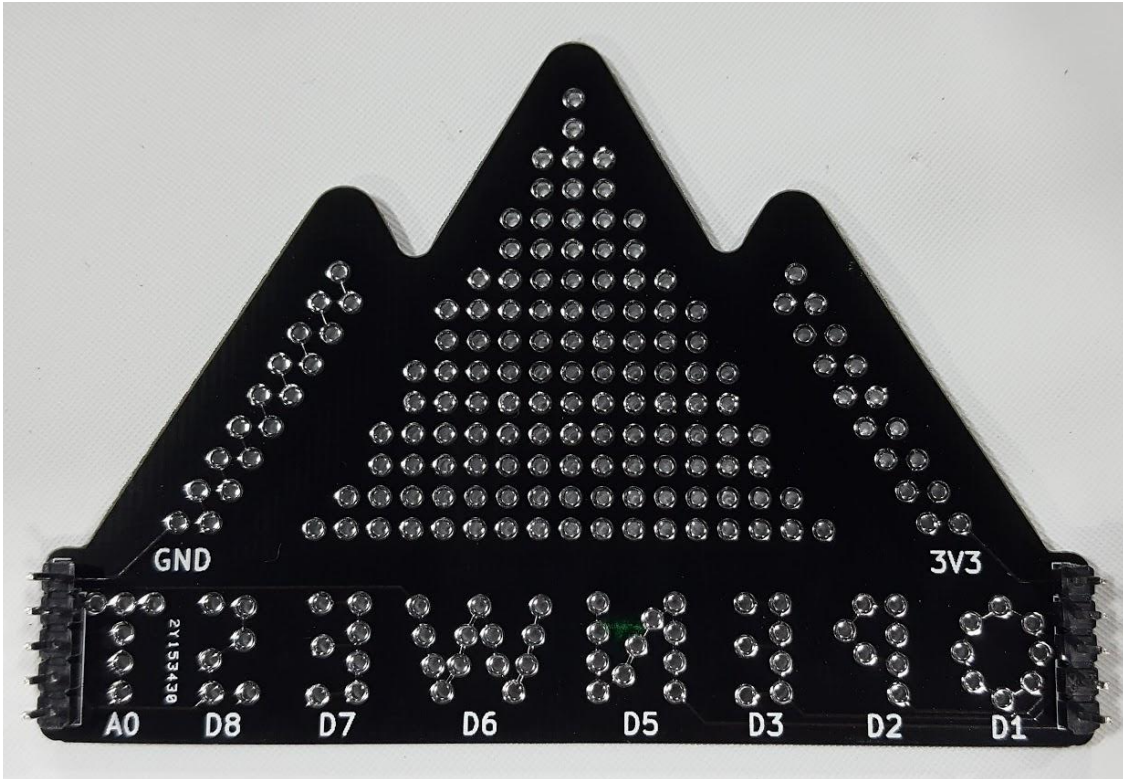
Arduino - Change MQTT Feeds 2

```
void loop() {
  // Ensure the connection to the MQTT server is alive (this will make the first
  // connection and automatically reconnect when disconnected).  See the MQTT_connect
  // function definition further below.
  MQTT_connect();

  // this is our 'wait for incoming subscription packets' busy subloop
  // try to spend your time here

  Adafruit_MQTT_Subscribe *subscription;
  while ((subscription = mqtt.readSubscription(10))) {
    if (subscription == &color1) {
      Serial.print(F("Got color1: "));
      Serial.println((char *)color1.lastread);
      Color1 = x2i((char *)color1.lastread);
      leds[0] = Color1;
      //FastLED.show();
    }
    if (subscription == &color2) {
```

Protoboard - Make Your Own Add-On!



Protoboard - Make Your Own Add-On!



Protoboard - Make Your Own Add-On!