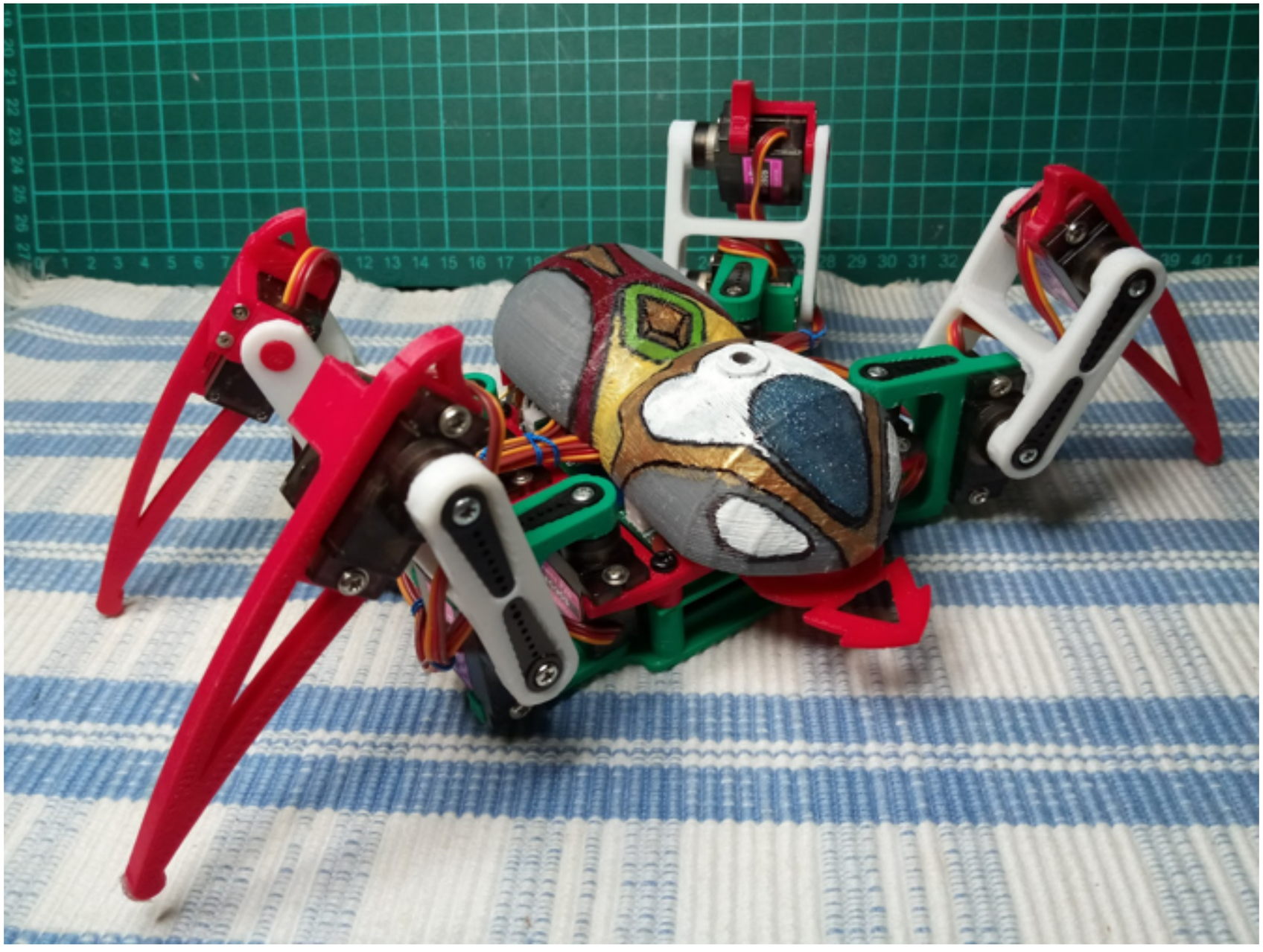
MiniPlan 軟體篇

Roy Chen

相關影片

- https://www.youtube.com/watch?v=L6SdtgnziMU
- https://www.facebook.com/unwirehk/videos/10157574962865495/

蜘蛛機器人

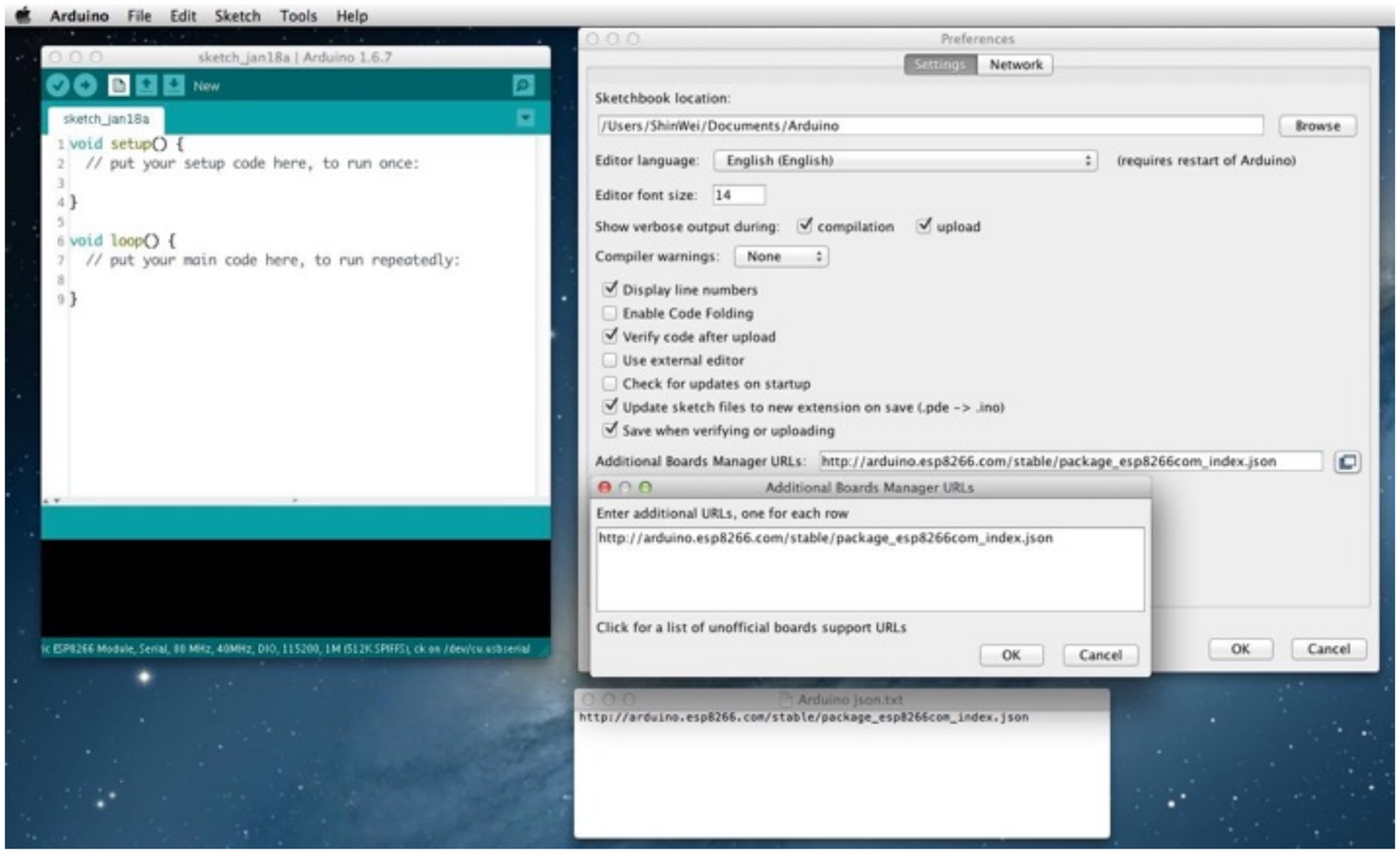


機械手臂

設定Arduino-ESP8266

- 額外的板子管理員網址

  http://arduino.esp8266.com/stable/package_esp8266com_index.json



設定Arduino-程式庫

- 加入函式庫 -> 程式庫管理員 ->搜尋”adafruit pwm servo”

- 安裝”Adafruit PWM Servo Driver Library”

設定Arduino-程式庫

- 開啟/Arduino/libraries/Adafruit_PWM_Servo_Driver_Library/Adafruit_PWMServoDriver.cpp, 並且做下列修正：

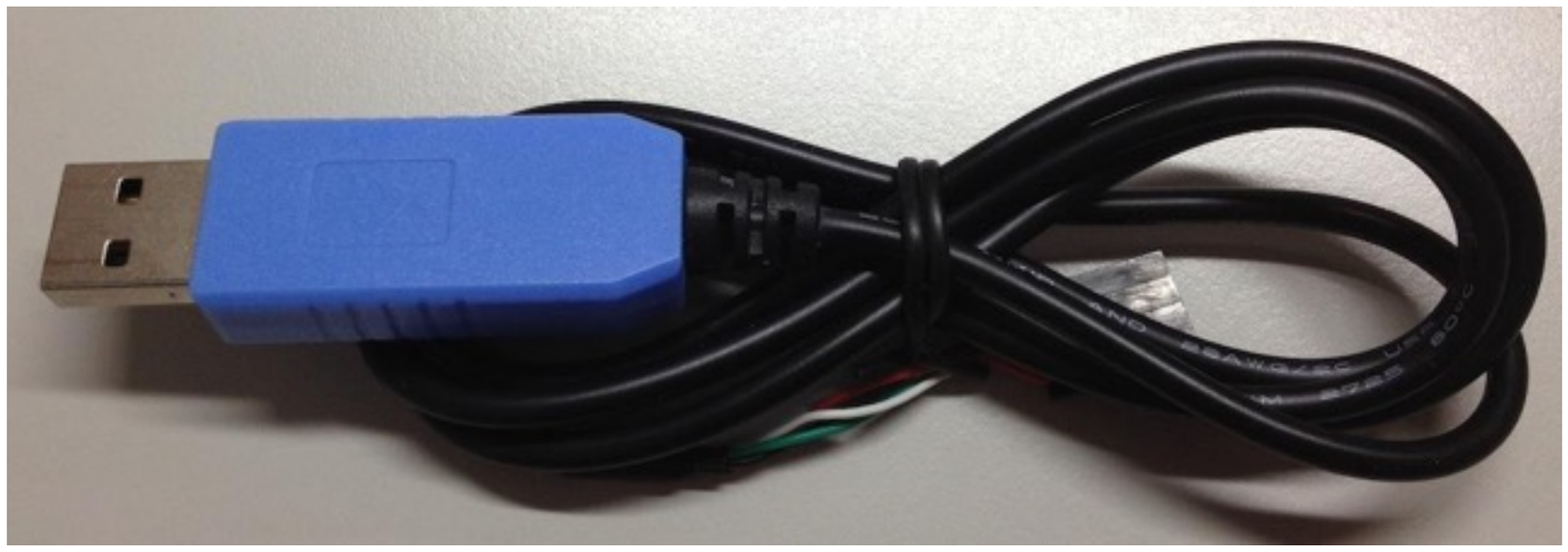
File Path : ~/Documents/Arduino/libraries/Adafruit_PWM_Servo_Driver_Library/Adafruit_PWMServoDriver.cpp

Adafruit_PWMServoDriver.cpp (no symbol selected)

```
/*************************************************
  This is a library for our Adafruit 16-channel PWM & Servo driver

  Pick one up today in the adafruit shop!
  ------> http://www.adafruit.com/products/815

  These displays use I2C to communicate, 2 pins are required to
  interface. For Arduino UNOs, thats SCL -> Analog 5, SDA -> Analog 4

  Adafruit invests time and resources providing this open source code,
  please support Adafruit and open-source hardware by purchasing
  products from Adafruit!

  Written by Limor Fried/Ladyada for Adafruit Industries.
  BSD license, all text above must be included in any redistribution
 *************************************************/

#include <Adafruit_PWMServoDriver.h>
#include <Wire.h>
//#if defined(__AVR__)
  #define WIRE Wire
//#elif defined(CORE_TEENSY) // Teensy boards
  //#define WIRE Wire
//#else // Arduino Due
  //#define WIRE Wire1
//#endif
```

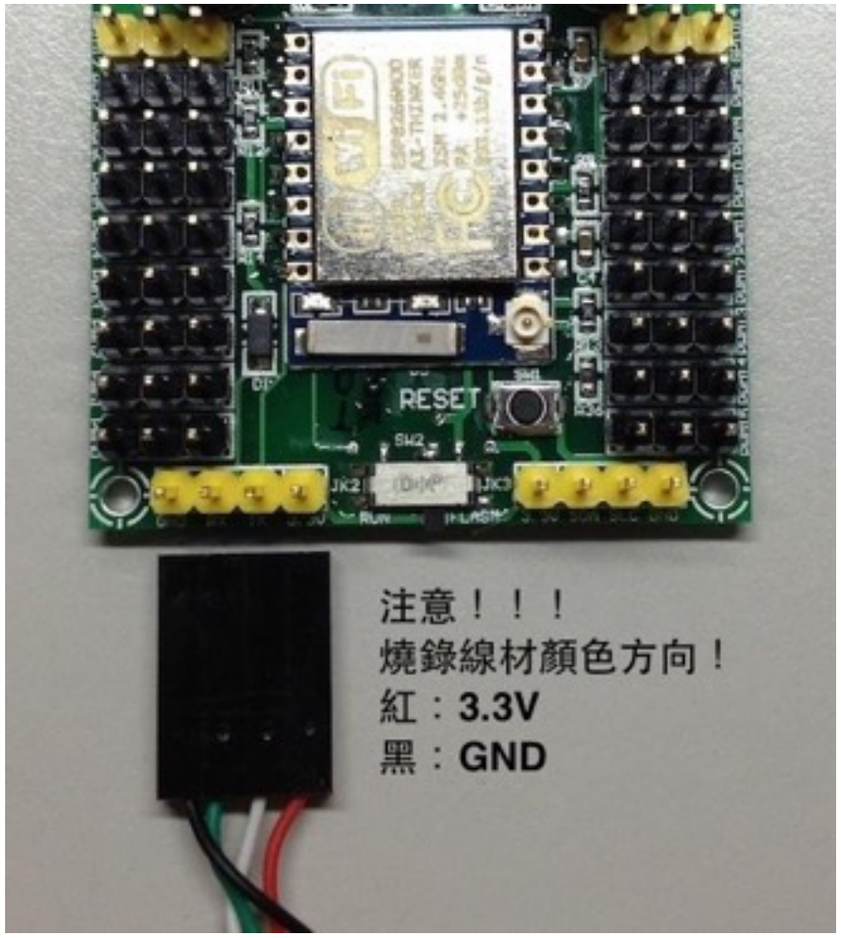
透過Arduino-IDE與機器人進行通訊

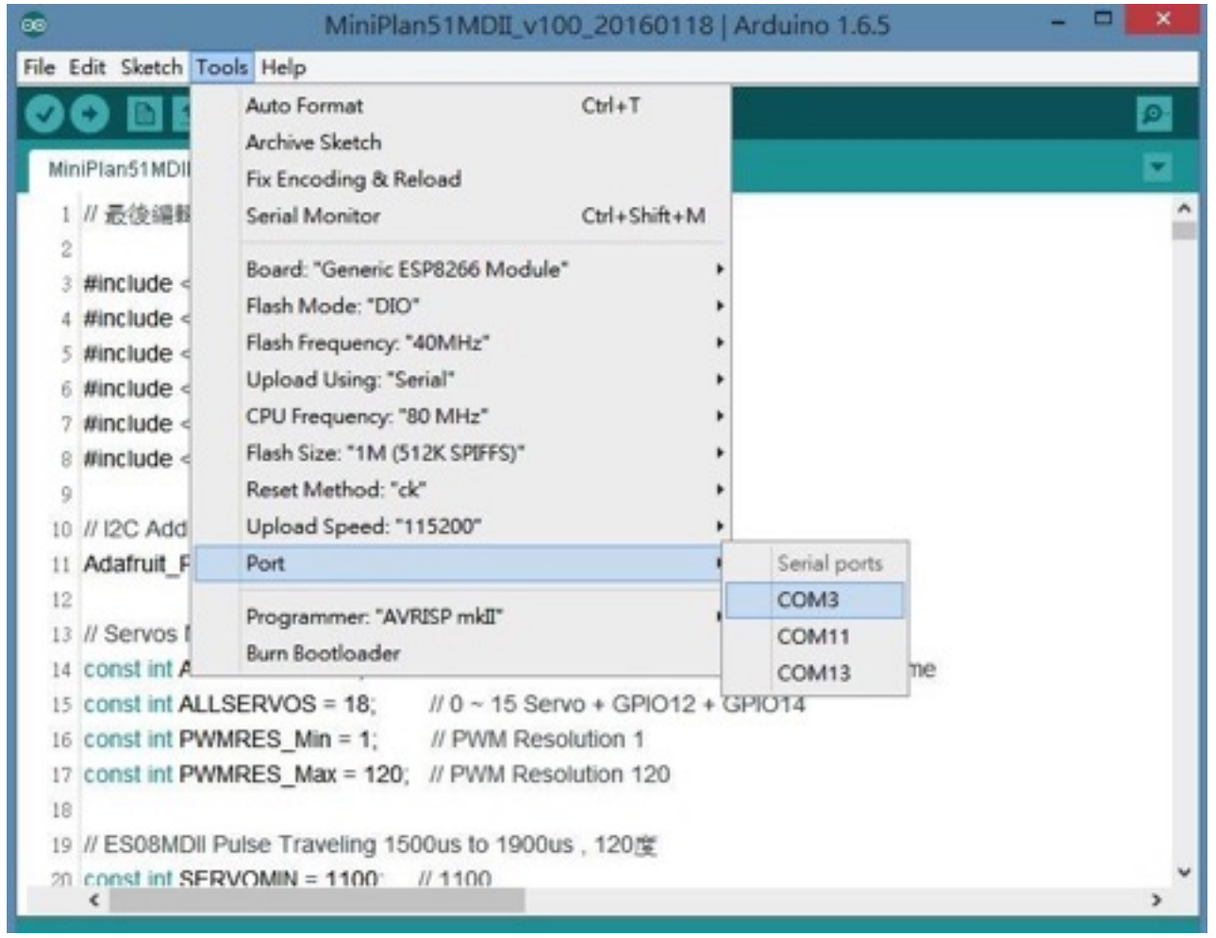
- 安裝驅動程式
  http://www.prolific.com.tw/US/ShowProduct.aspx?p_id=225&pcid=41



透過Arduino-IDE與機器人進行通訊

- 設定Arduino-IDE連結方式

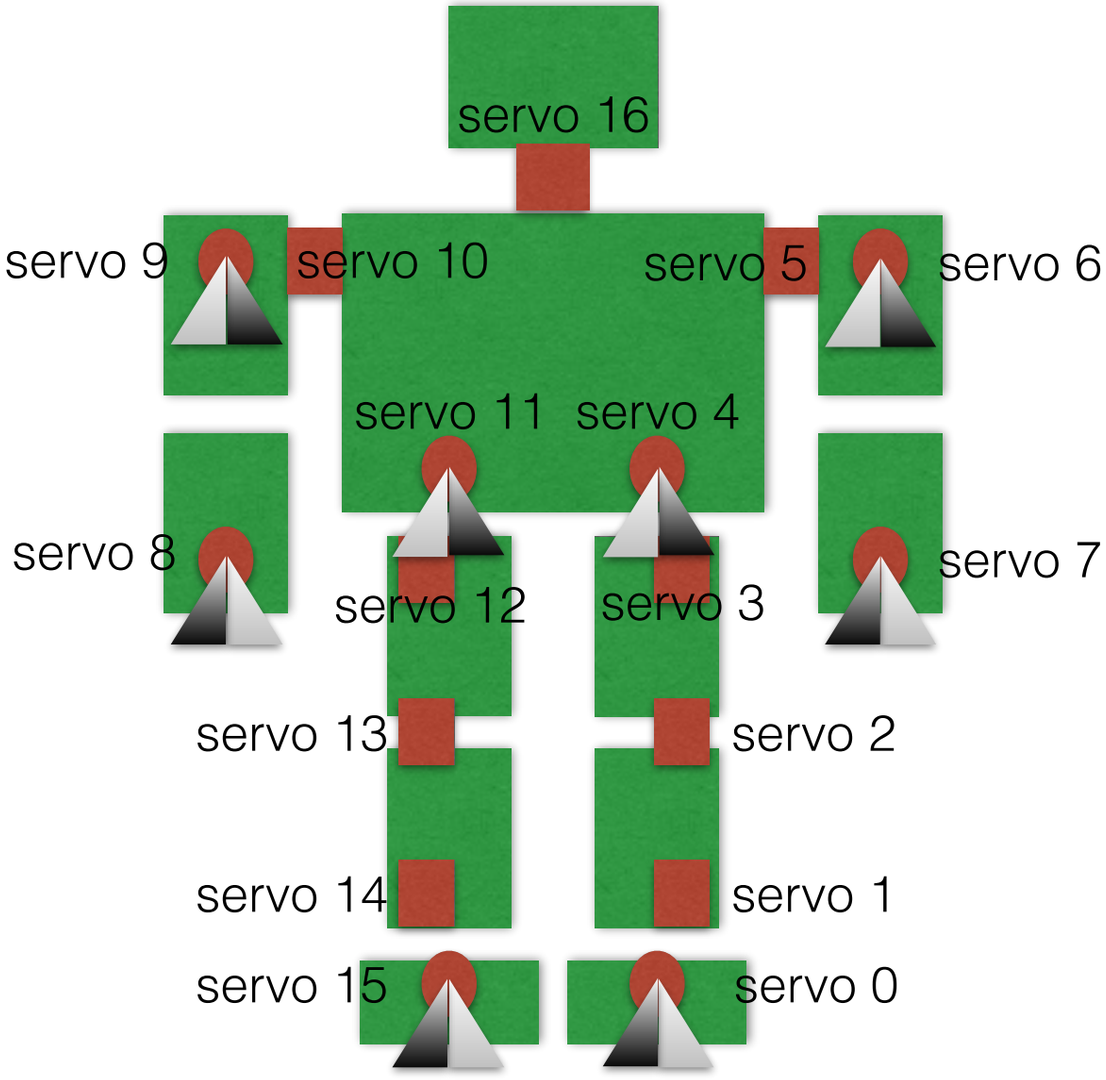




https://github.com/makee-workshop/Miniplan-workshop

Makee

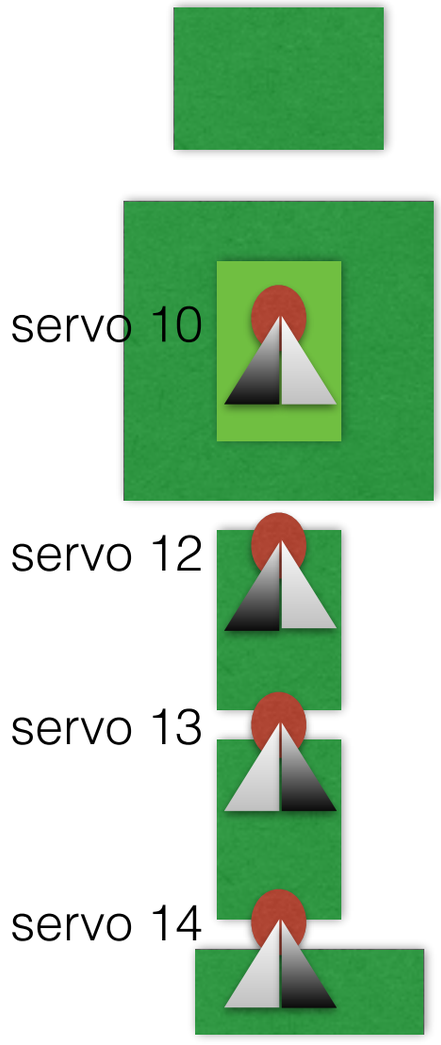
MiniPlan



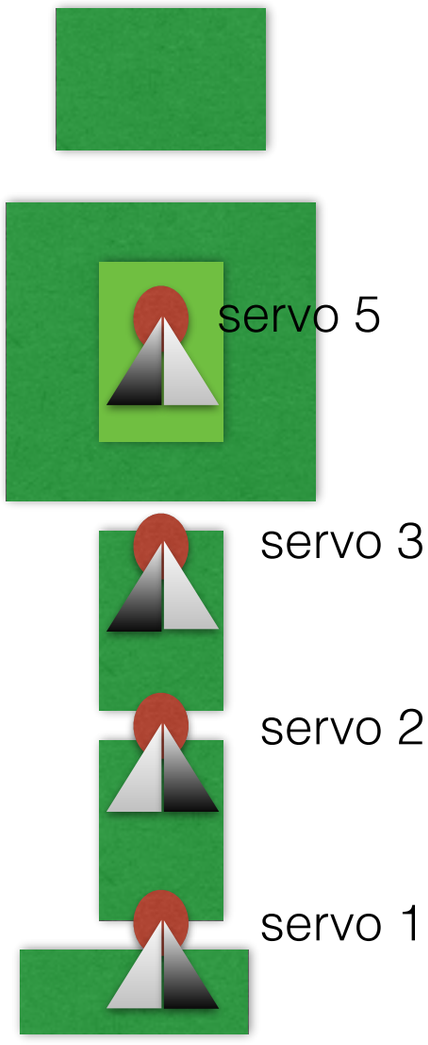
Front

Top

MiniPlan

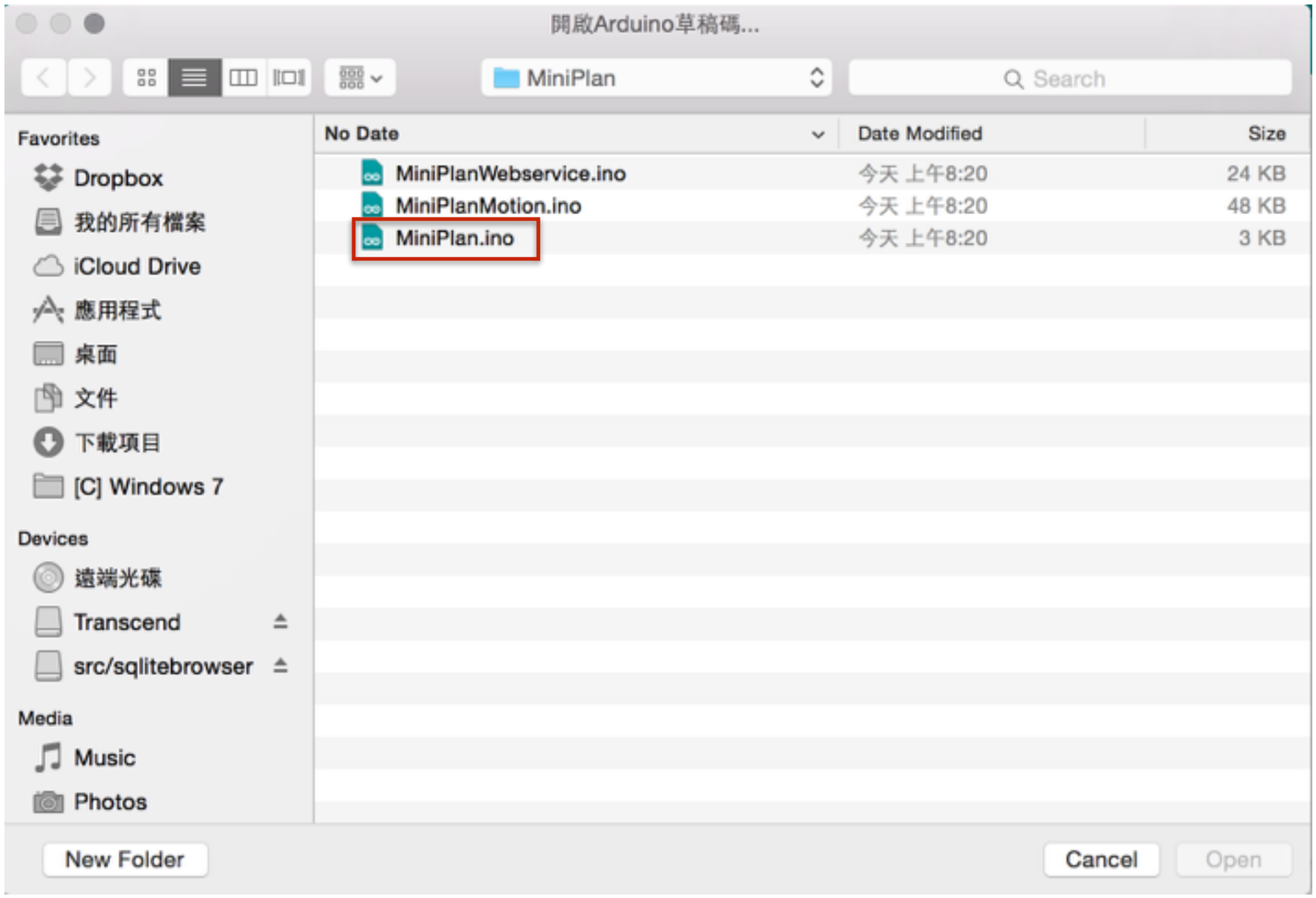


Left



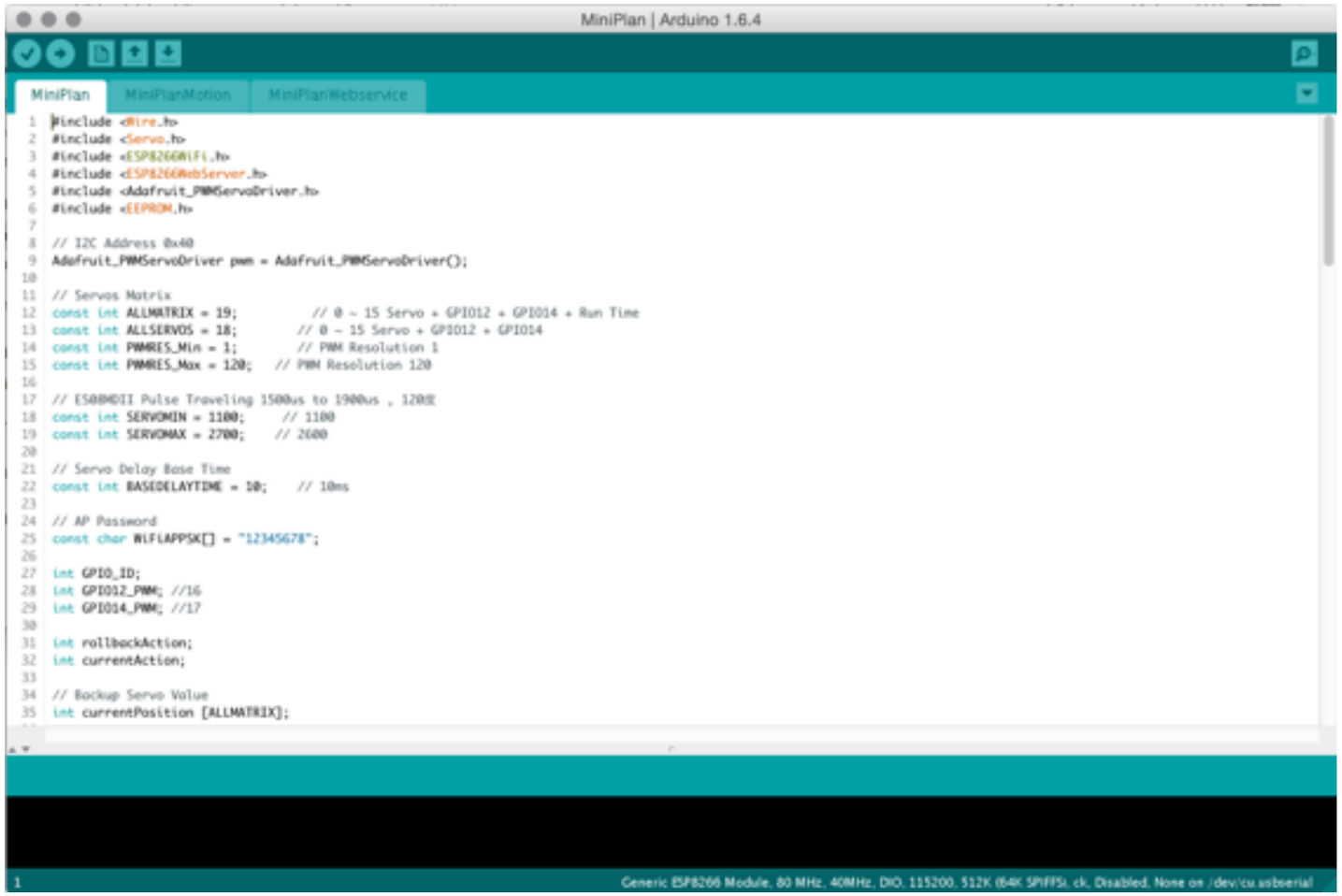
Right

開啟MiniPlan專案



Arduino-主畫面

- MiniPlan
- MiniPlanMotion
- MinPlanWebservice



MiniPlan

- 初始化MiniPlan的設定
  - AP Mode設定
  - PWM元件初始化
  - 啟用網頁伺服器

MiniPlanMotion

- 設定MiniPlan的動作

MiniPlanWebservice

- 實作Webservice API

如何增加動作

- 設計Webservice API
- 設計動作矩陣
- 將API與動作矩陣做連結

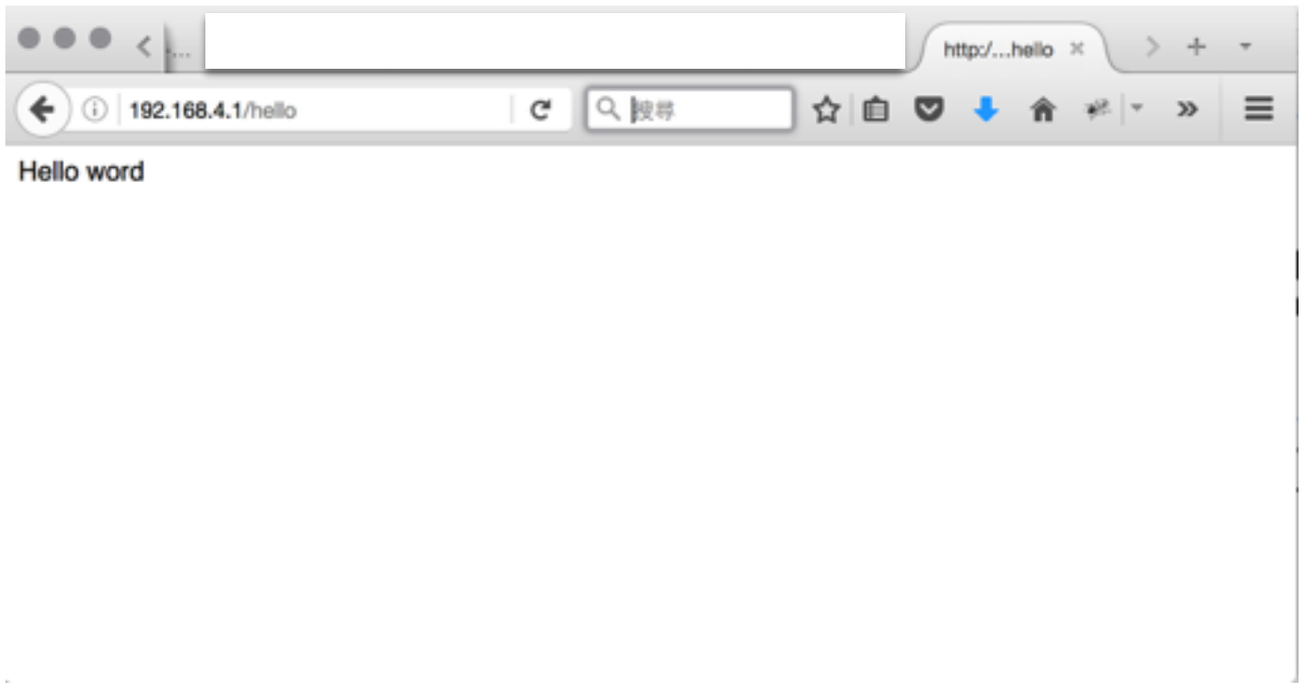
增加Webservice API

- 在MiniPlanWebservice加入下列的程式碼

```
void handleHello(){
  String content = "";
  content = "<html>";
  content += "<body>";
  content += "Hello word";
  content += "</body>";
  content += "</html>";
  server.send(200, "text/html", content);
}

void enableWebServer(){
  HTTPMethod getMethod = HTTP_GET;
  server.on("/", getMethod, handleIndex);
  server.on("/zero", getMethod, handleZero);
  server.on("/editor", getMethod, handlerEditor);
  server.on("/save", getMethod, handleSave);
  server.on("/controller", getMethod, handleController);
  server.on("/action", getMethod, handleAction);
  server.on("/motor", getMethod, handleMotor);
  server.on("/reset", getMethod, handleReset);
  server.on("/setting", getMethod, handleSetting);
  server.on("/hello", getMethod, handleHello);
  server.begin();
  Serial.println("service enable");
}
```

Webservice API結果

- 在url輸入192.168.4.1/hello會顯示下列的畫面



增加動作矩陣-1

- 何謂動作矩陣

```
int action00 [ ] PROGMEM = {   65,      35,      80,      60,
  80,     100,     95,      80,
  40,      25,      20,      30,
  55,      35,      75,      50,
  90,      90,       0      };
```

Servo:0-15

Servo:16, 17　執行時間

增加動作矩陣-2

- 如何觸發動作

```
void resetToStand()
{
  for ( int index = 0; index < ALLMATRIX; index++)
  {
    currentPosition[index] = action00[index] + readKeyValue(index);
  }
  for (int iServo = 0; iServo < ALLSERVOS; iServo++)
  {
    setPWMVal(iServo, currentPosition[iServo]);
    delay(10);
  }
  Serial.print("resetToStand complete:");
}
```

Servo 控制

連結API與動作矩陣

- 在MiniPlan加入下列程式碼

```
void handleHelloAction(){
  String content = "";
  content = "<html>";
  content += "<body>";
  content += "Hello word";
  content += "</body>";
  content += "</html>";
  resetToHello();
  server.send(200, "text/html", content);
}
```

Webservice API結果

- 在url輸入192.168.4.1/hello會顯示下列的畫面以及機器人會做動作