國立暨南國際大學
National Chi Nan University
靜宜大學資訊工程學系
Computer Science & Information Engineering

物聯網連結智慧生活
環境監控與智慧家電的開發與應用

報告者：曹永忠(曹建國)

@TCN創客基地

日期：2021年8月14日

大 綱

- 前言
- 環境監控
- 環境監控平台
- 分散式顯示裝置開發
- Ameba空氣盒子
- ＥＳＰ３２智慧燈泡
- 日光燈源開發
- 虛擬開關
- 結論

環境監控

實施場域

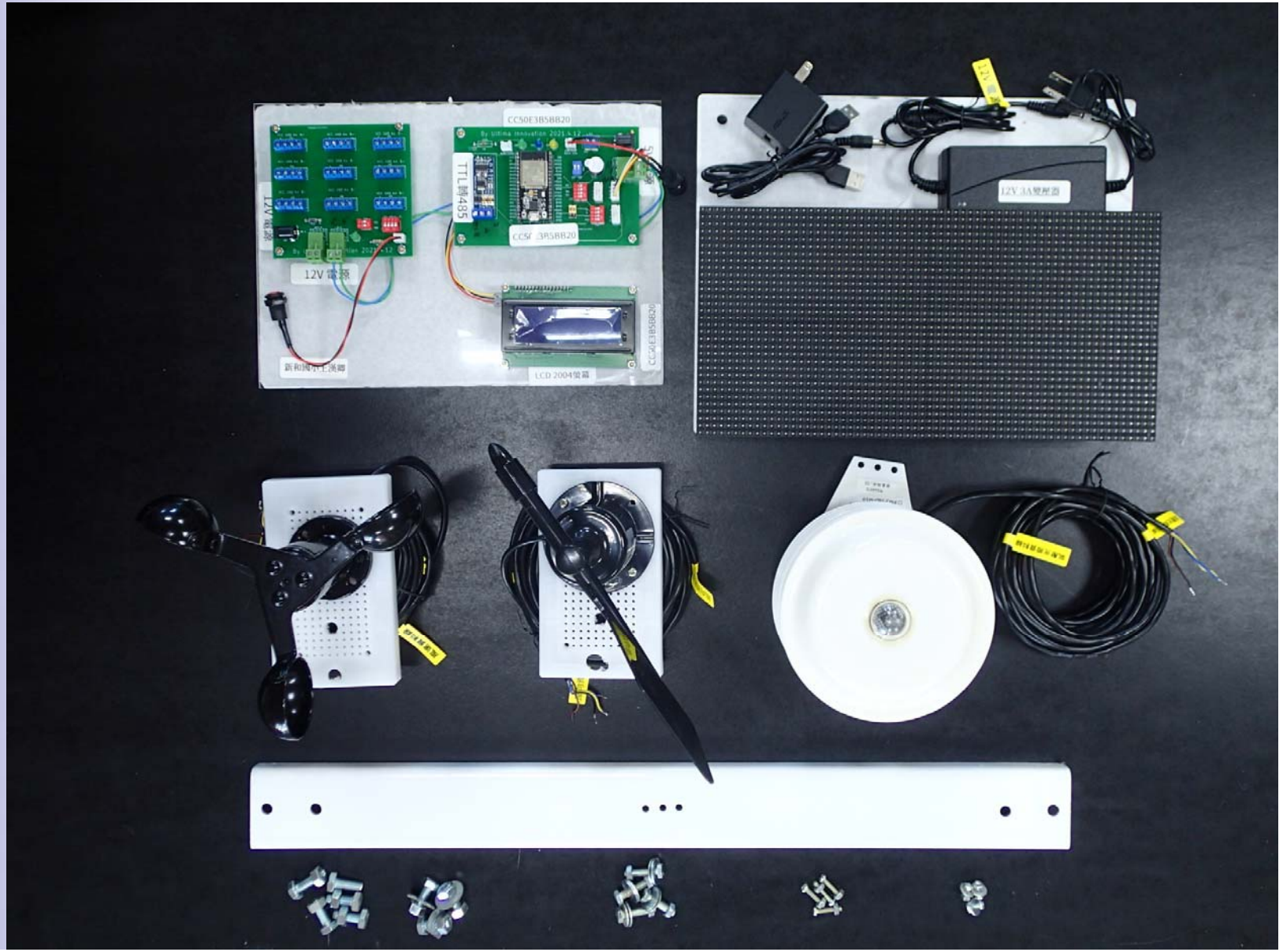
- 台中市清水區吳厝國小
- 新北市新店區新和國小

新和國小
氣象監控站

材料清單

安裝地點

感測器組立



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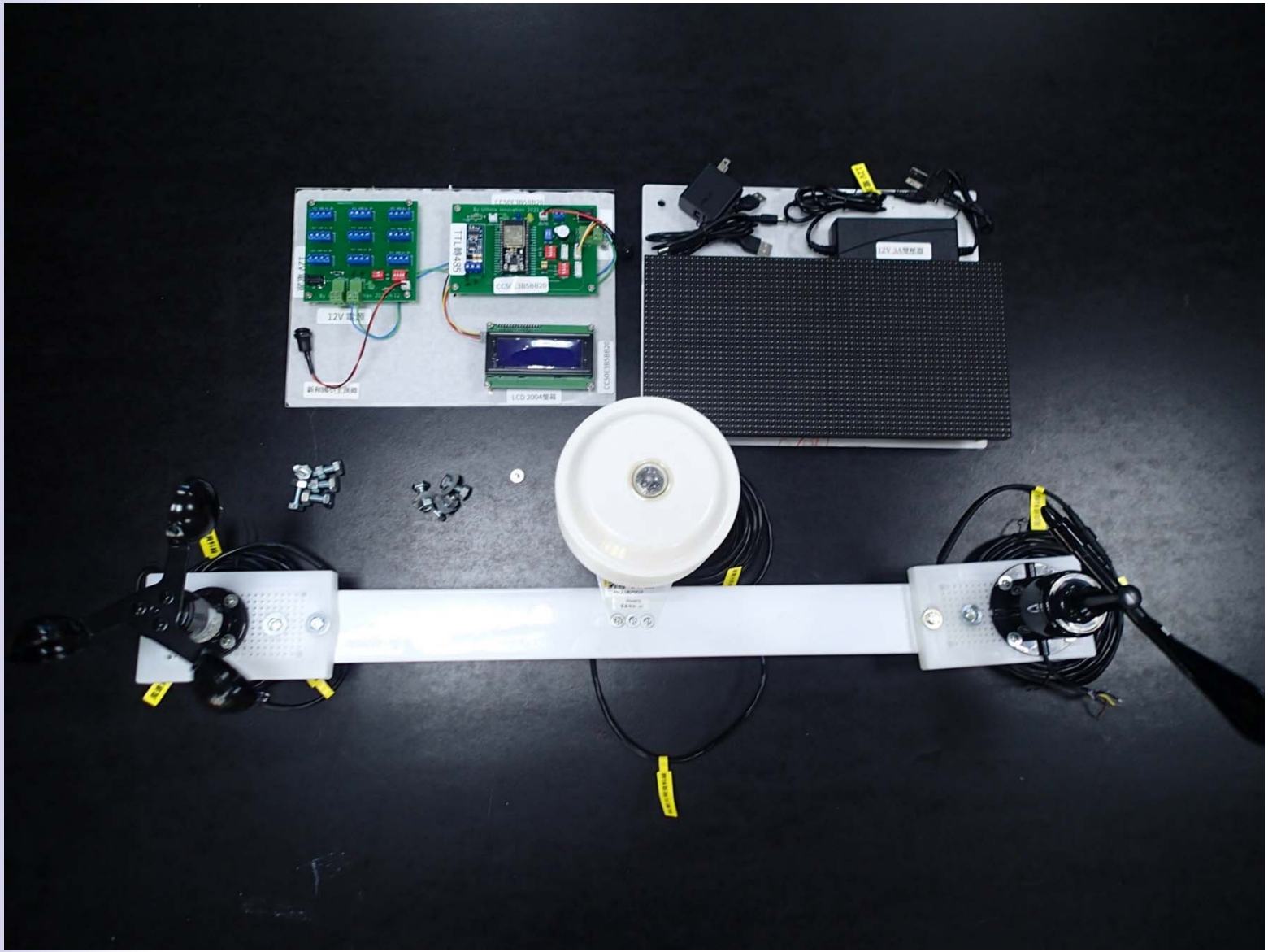

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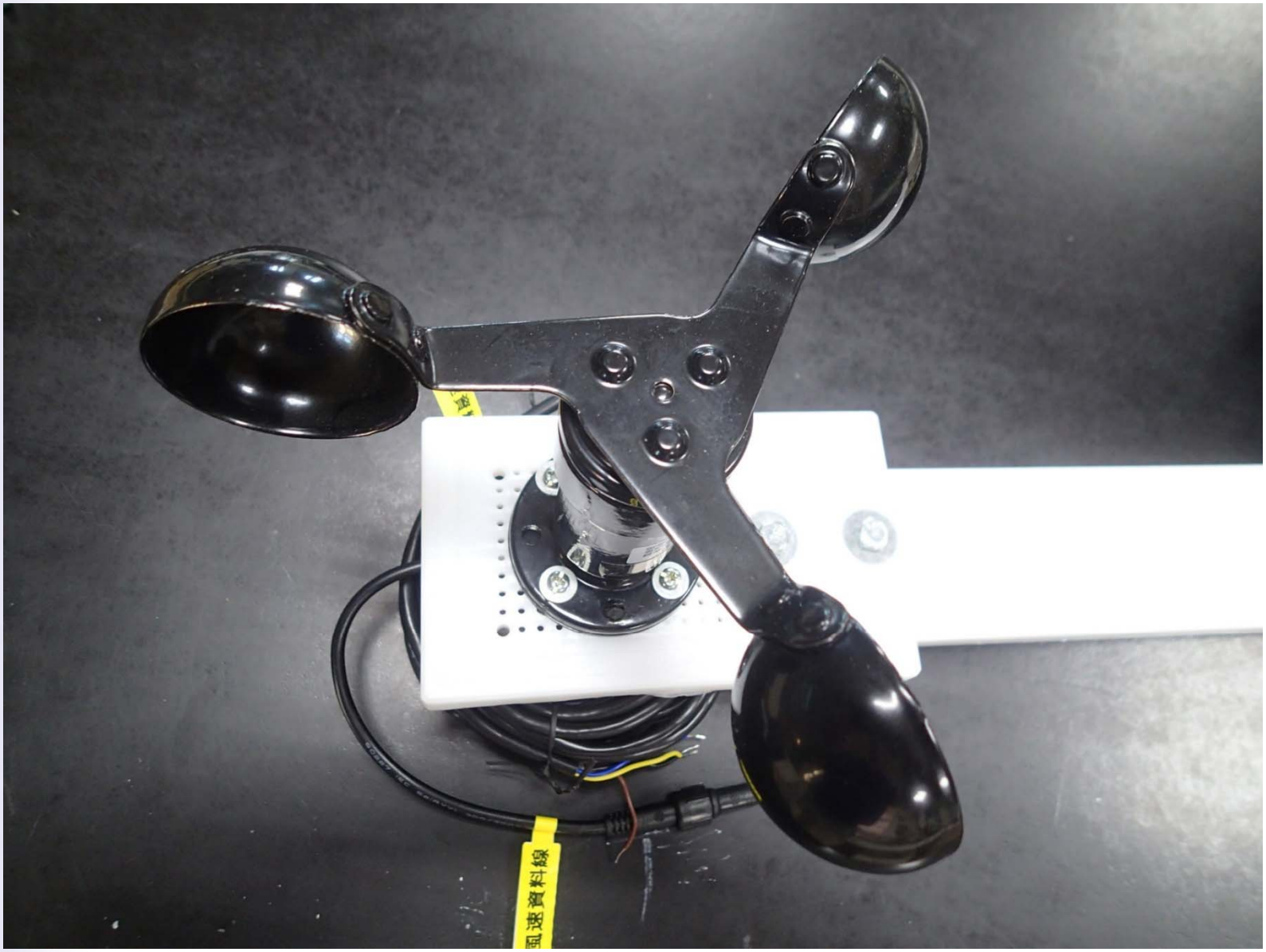

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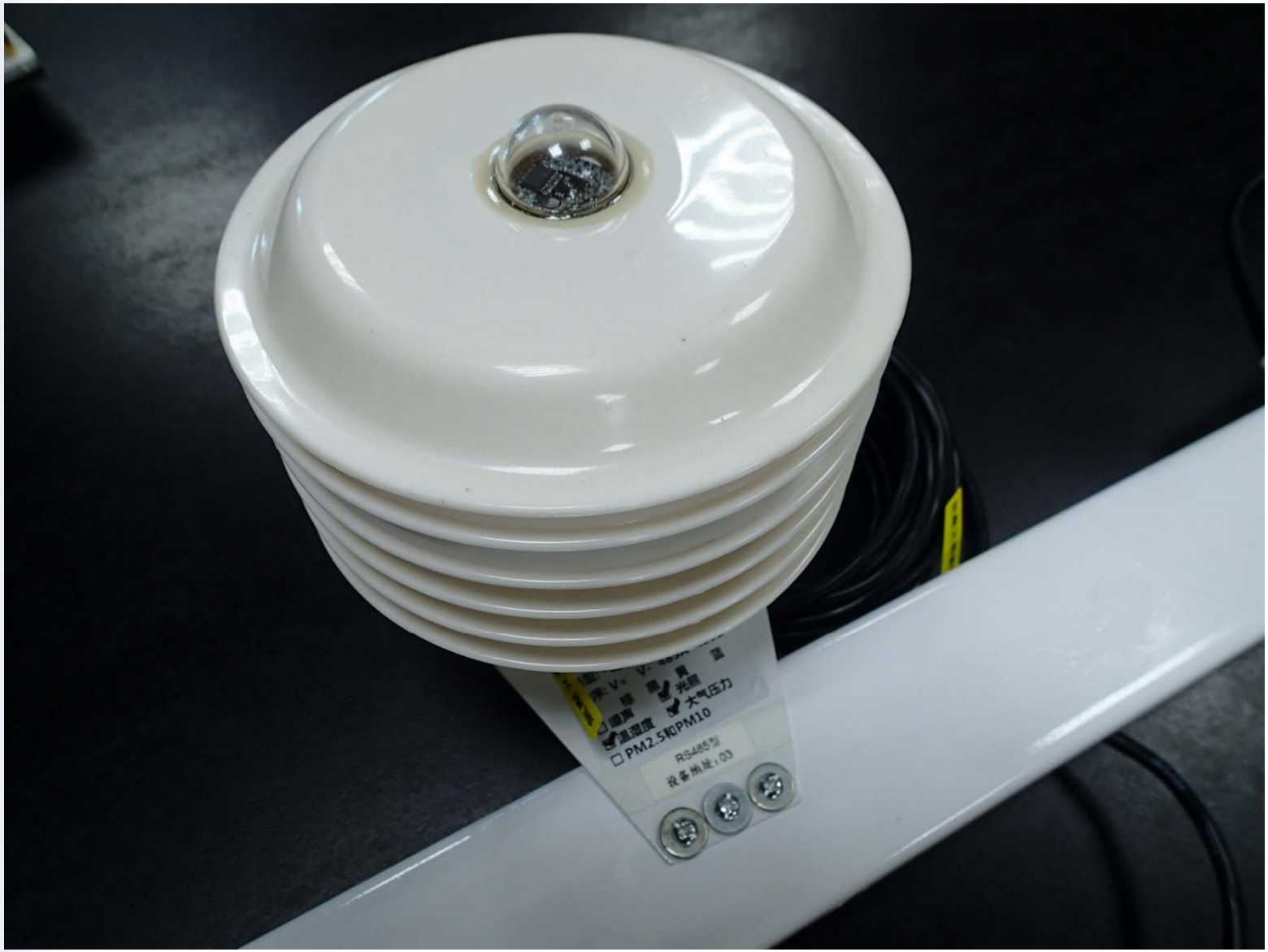

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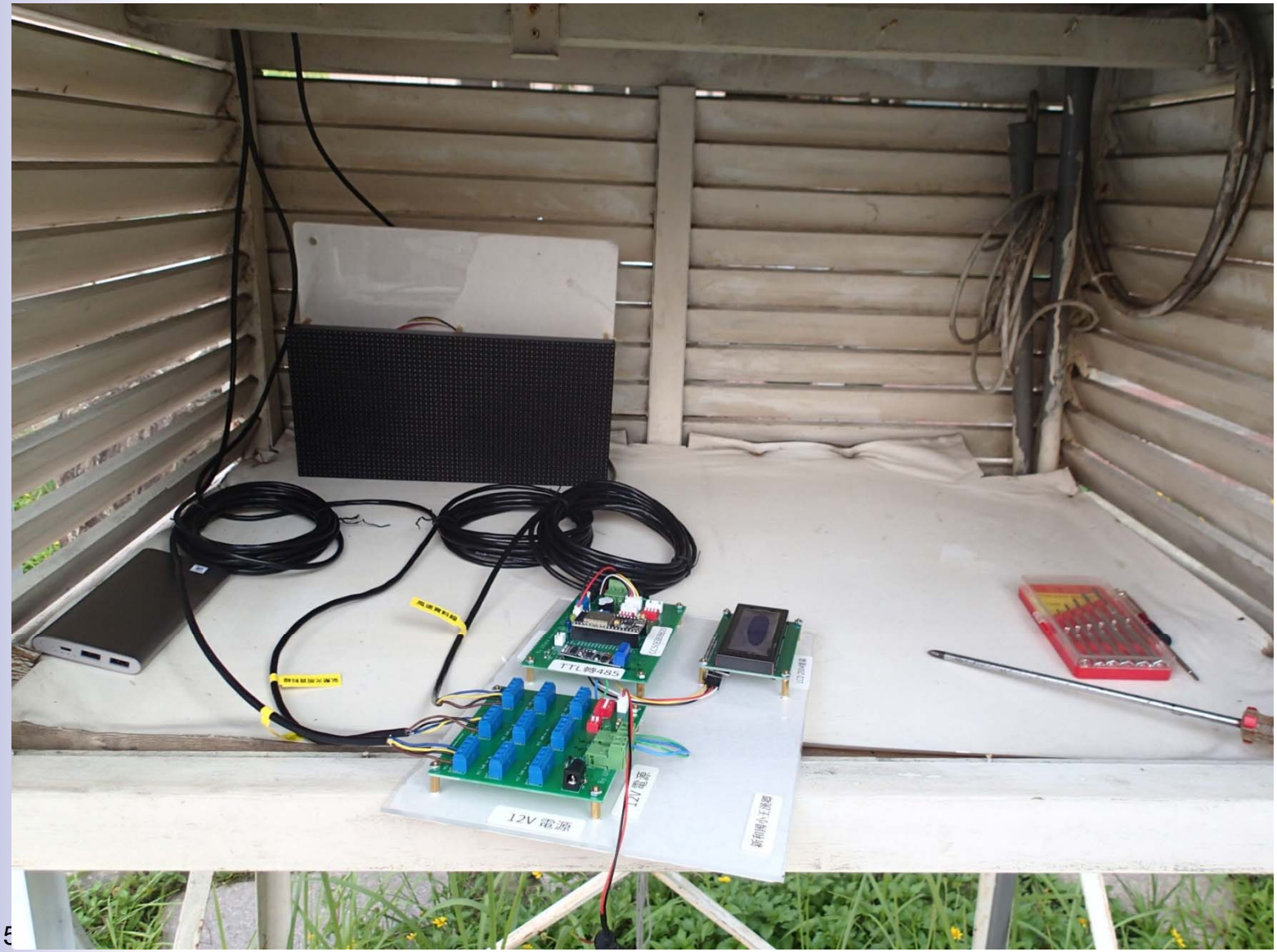

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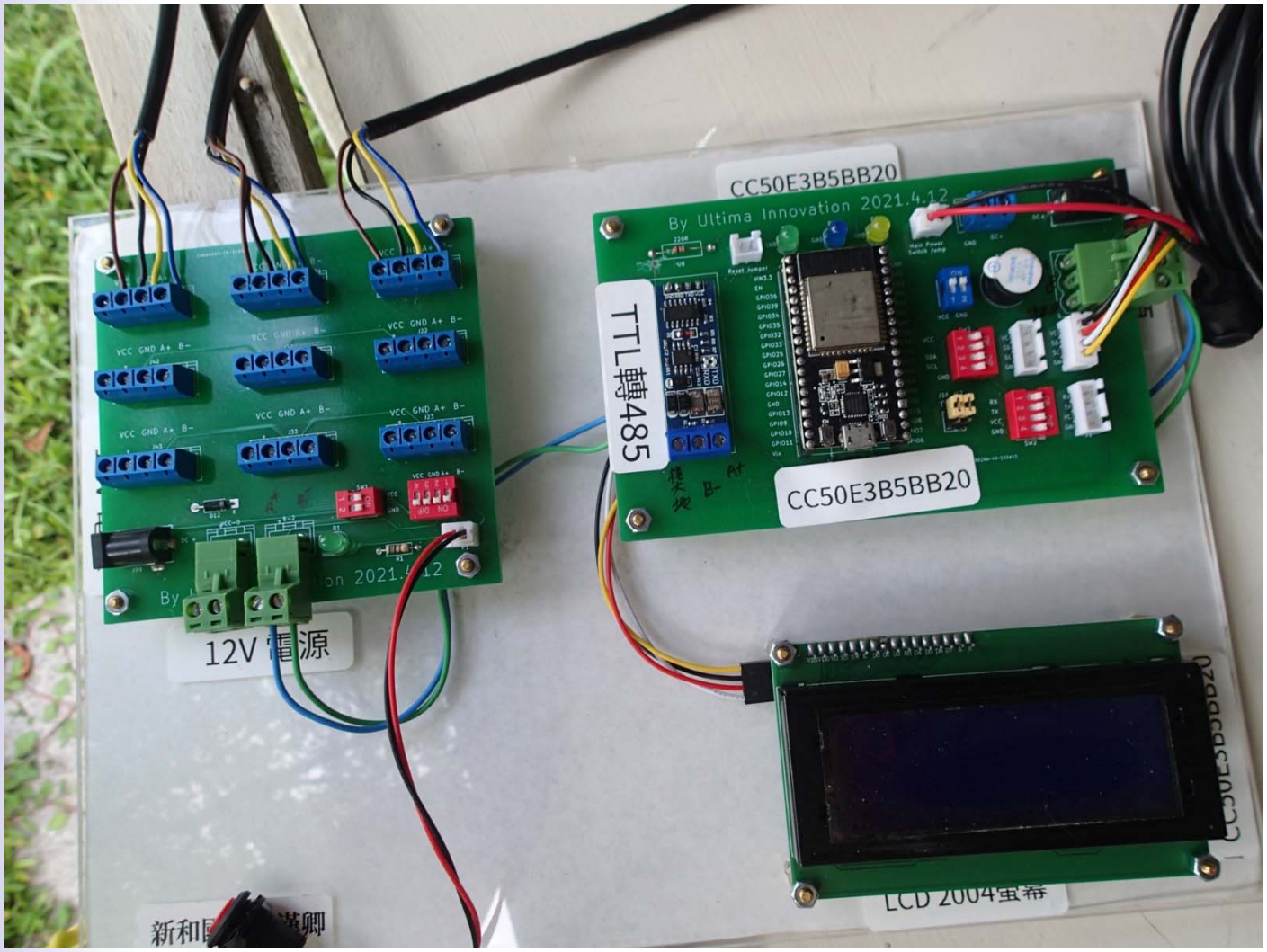
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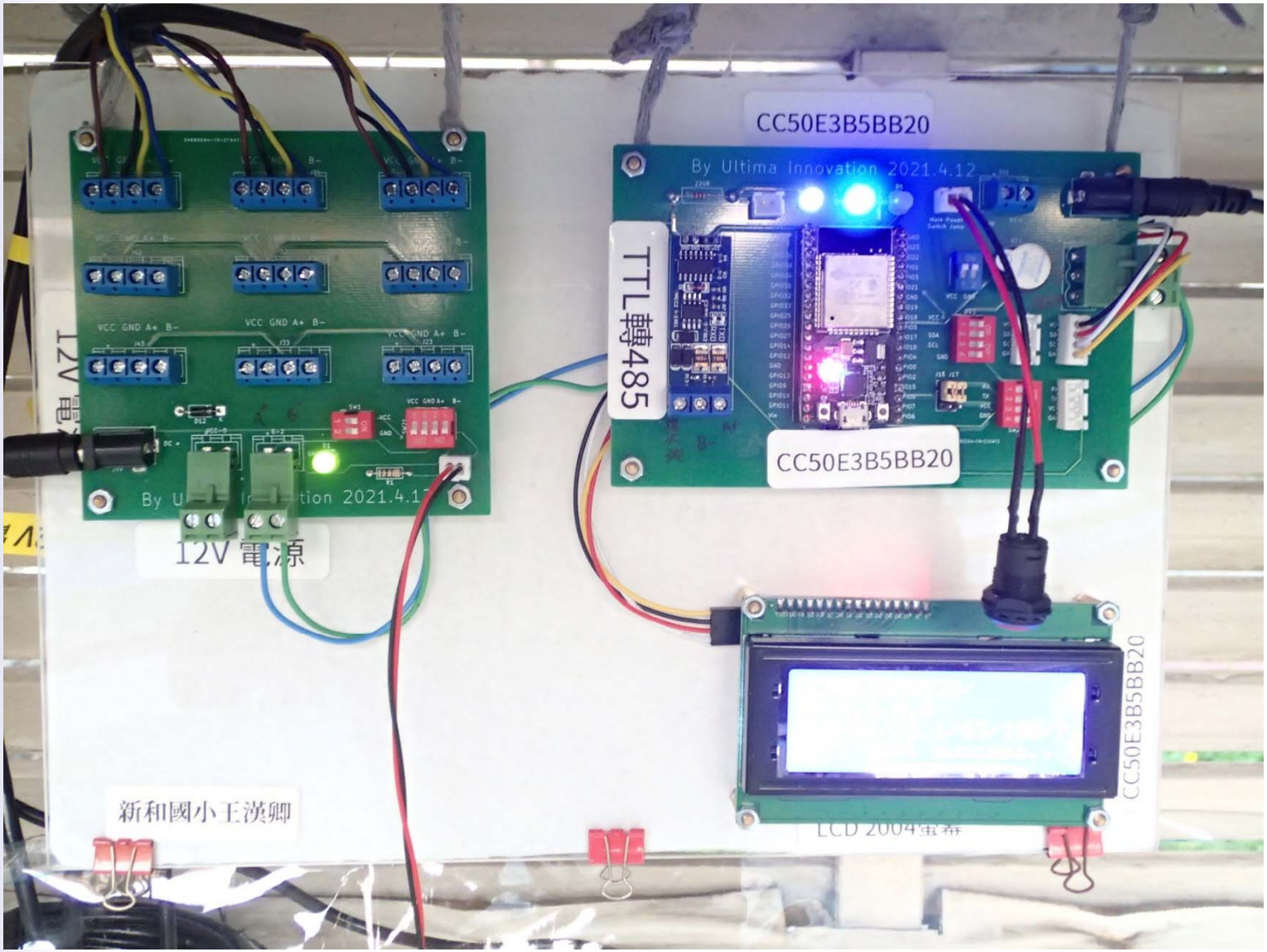
By Ultima Innovation 2021.4.12
TTL轉485
CC50E3B5BB20
12V 電源
LCD 2004

感測器組立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By Ultima Innovation 2021.4.12
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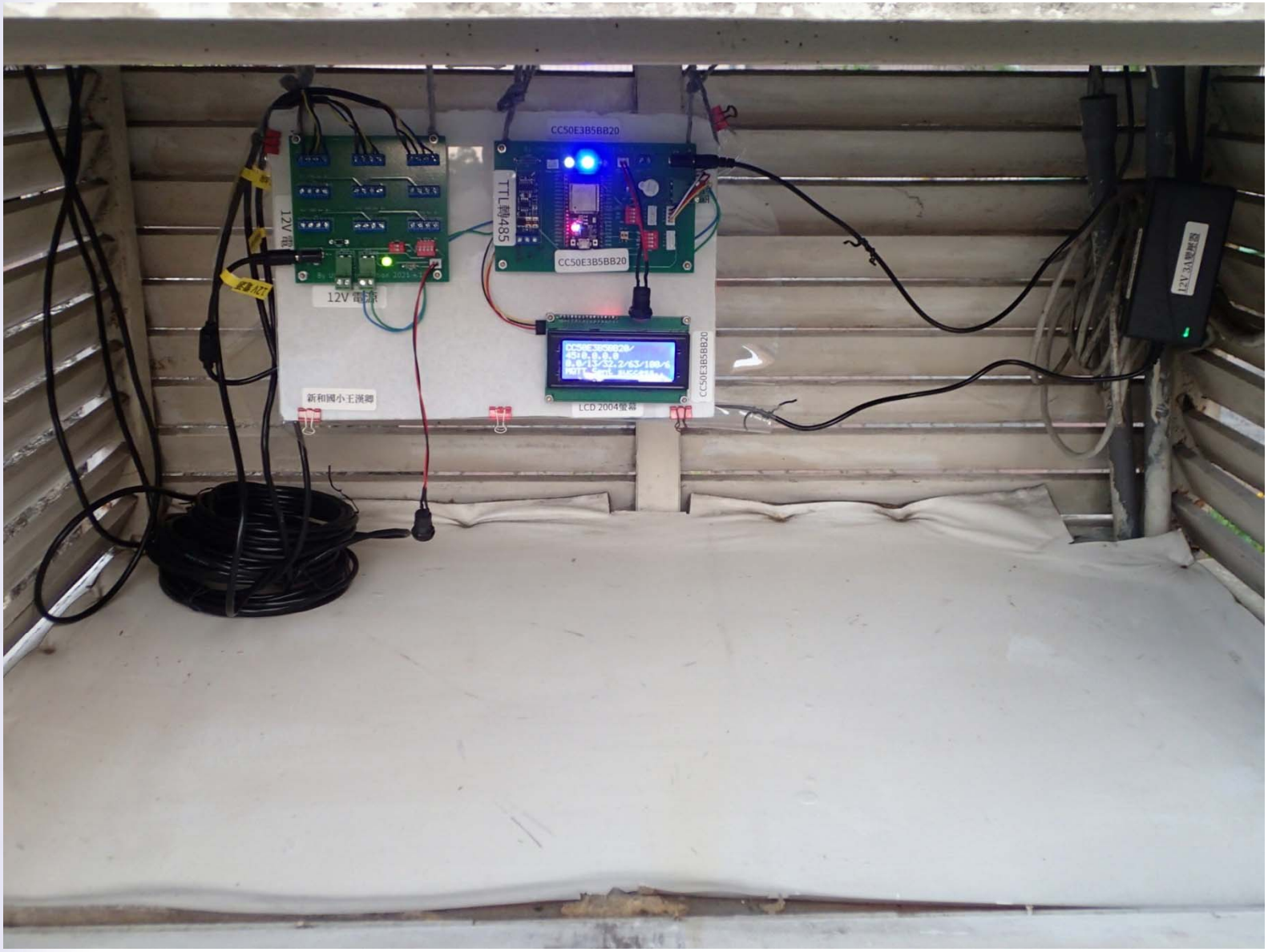
CC50E3B5BB20
12V 電源
新和國小 王漢卿
CC50E3B5BB20

感測器組立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新和國小王溪鄉
LCD 2004螢幕
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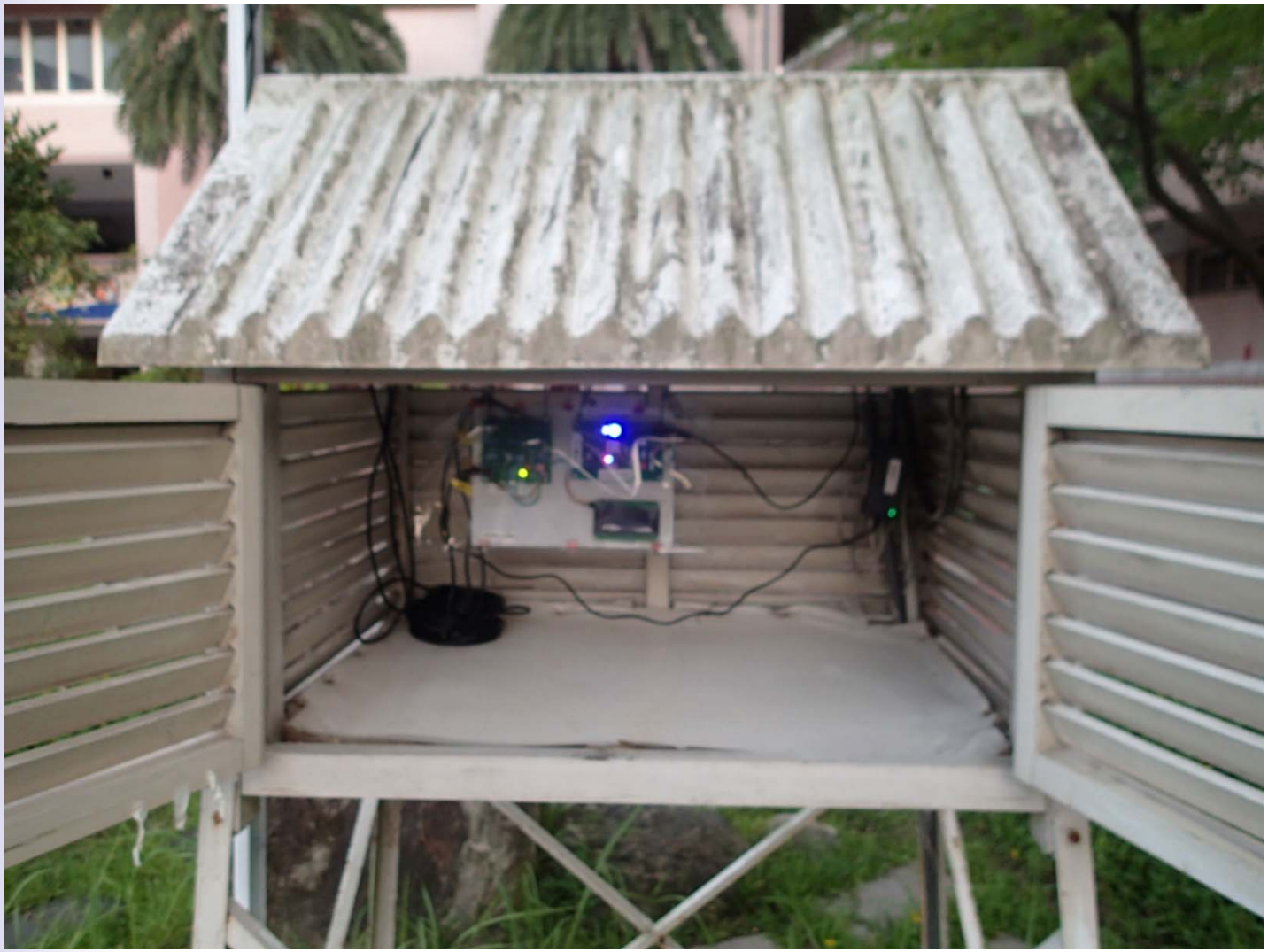
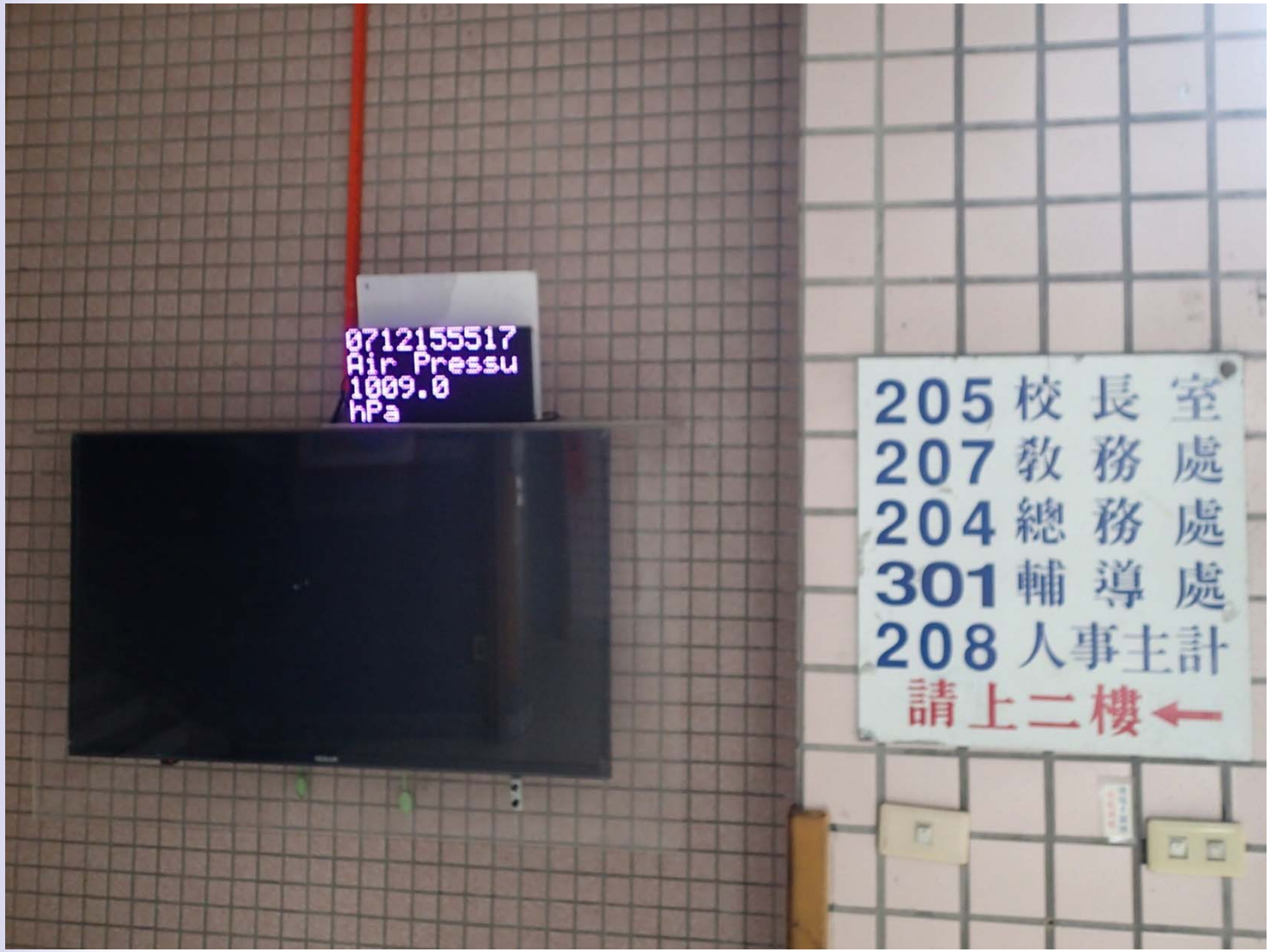


感測器組立

感測器組立

運轉影片

長官處裝置顯示器


0712155517
Air Pressu
1009.0
hPa
205 校長室
207 教務處
204 總務處
301 輔導處
208 人事主計
請上二樓

長官處裝置顯示器

長官處裝置顯示器

測試顯示裝置

公眾裝置

顯示學校

資訊站顯示

溫度顯示

濕度顯示

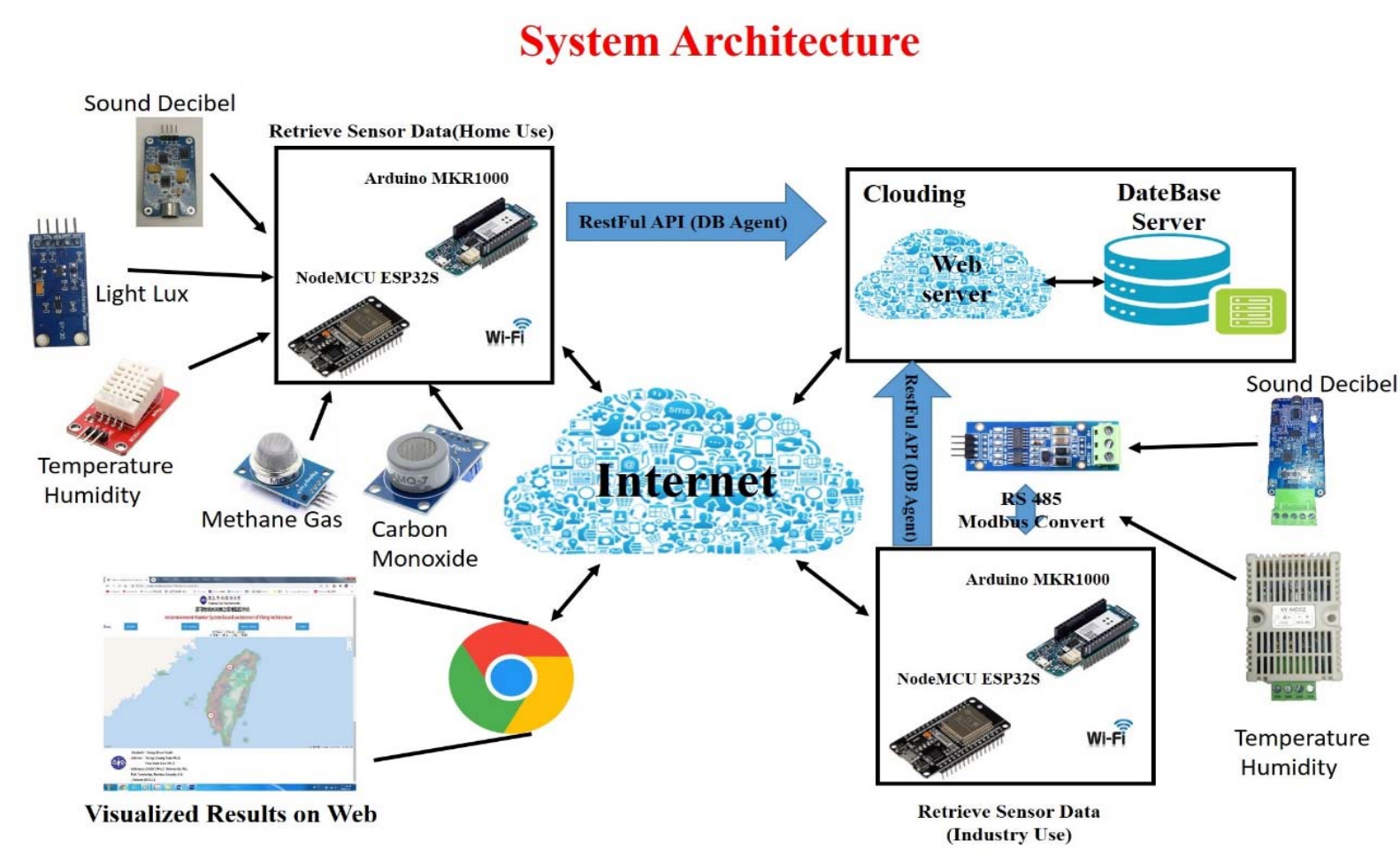
亮度顯示

風向顯示

氣壓顯示

環境監控平台

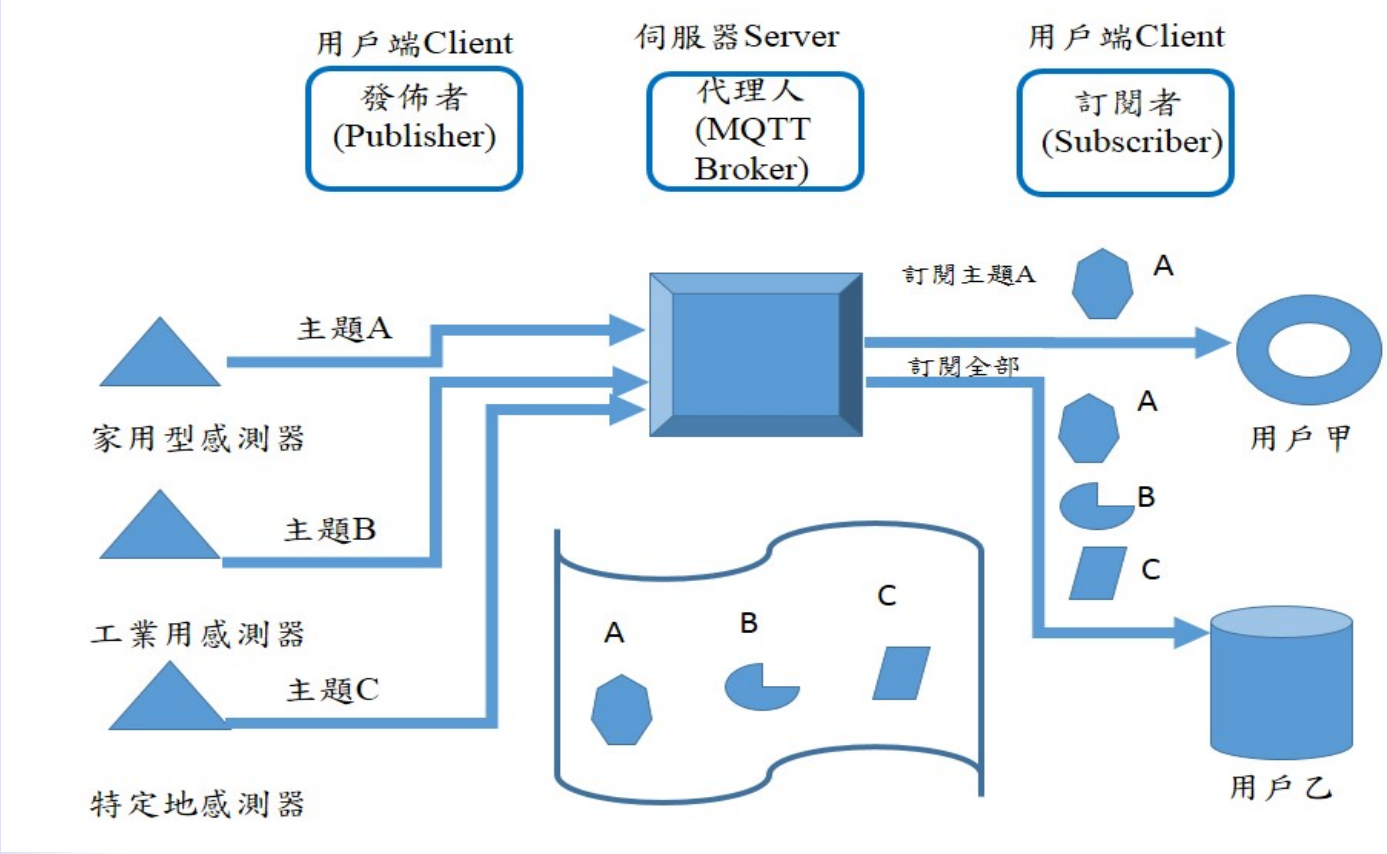
物聯網為基礎之系統架構



系統實體架構圖

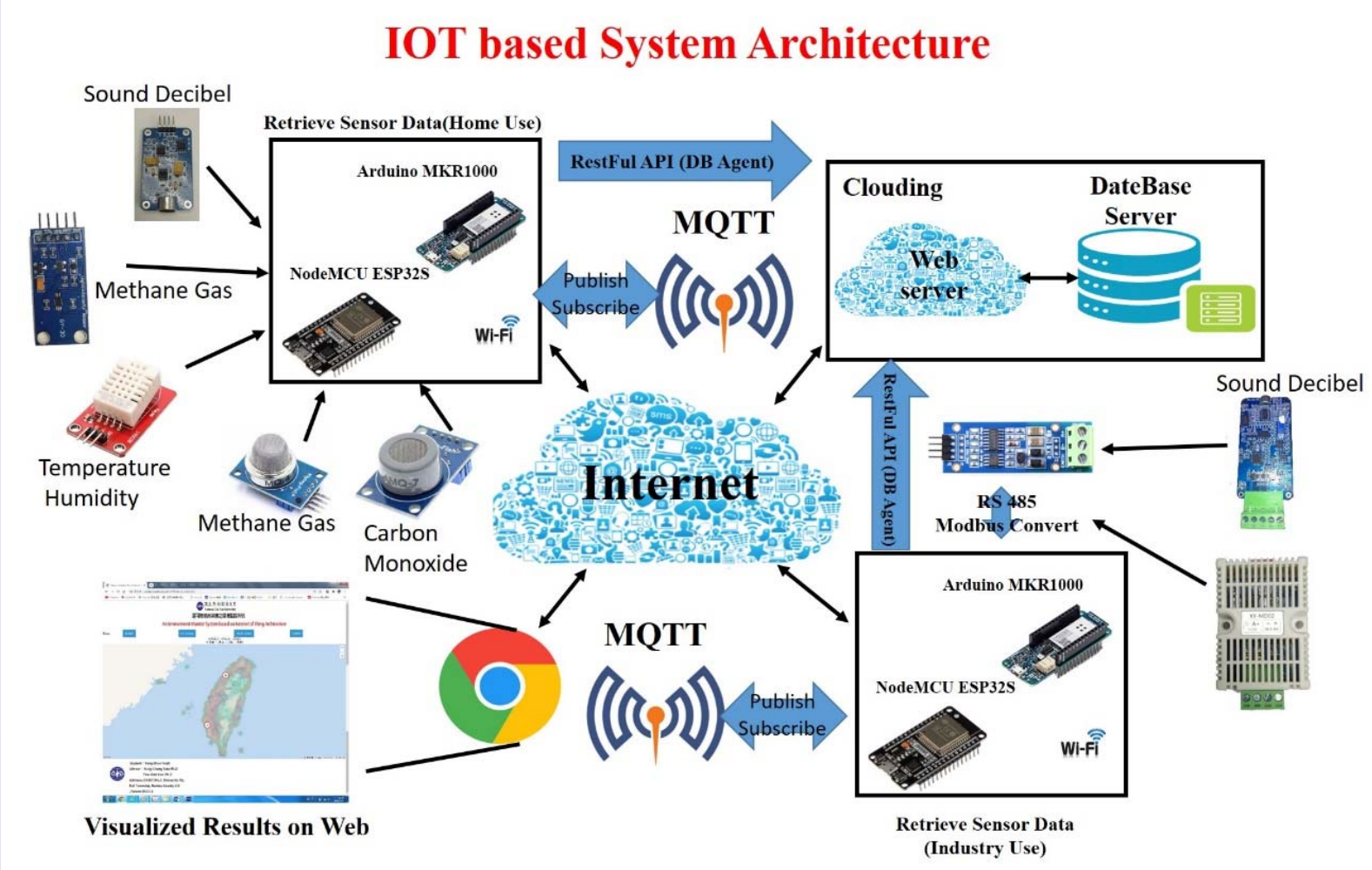
資料來源: 本研究整理

物聯網為基礎之系統架構



MQTT運作示意圖 資料來源: 本研究整理

物聯網為基礎之系統架構

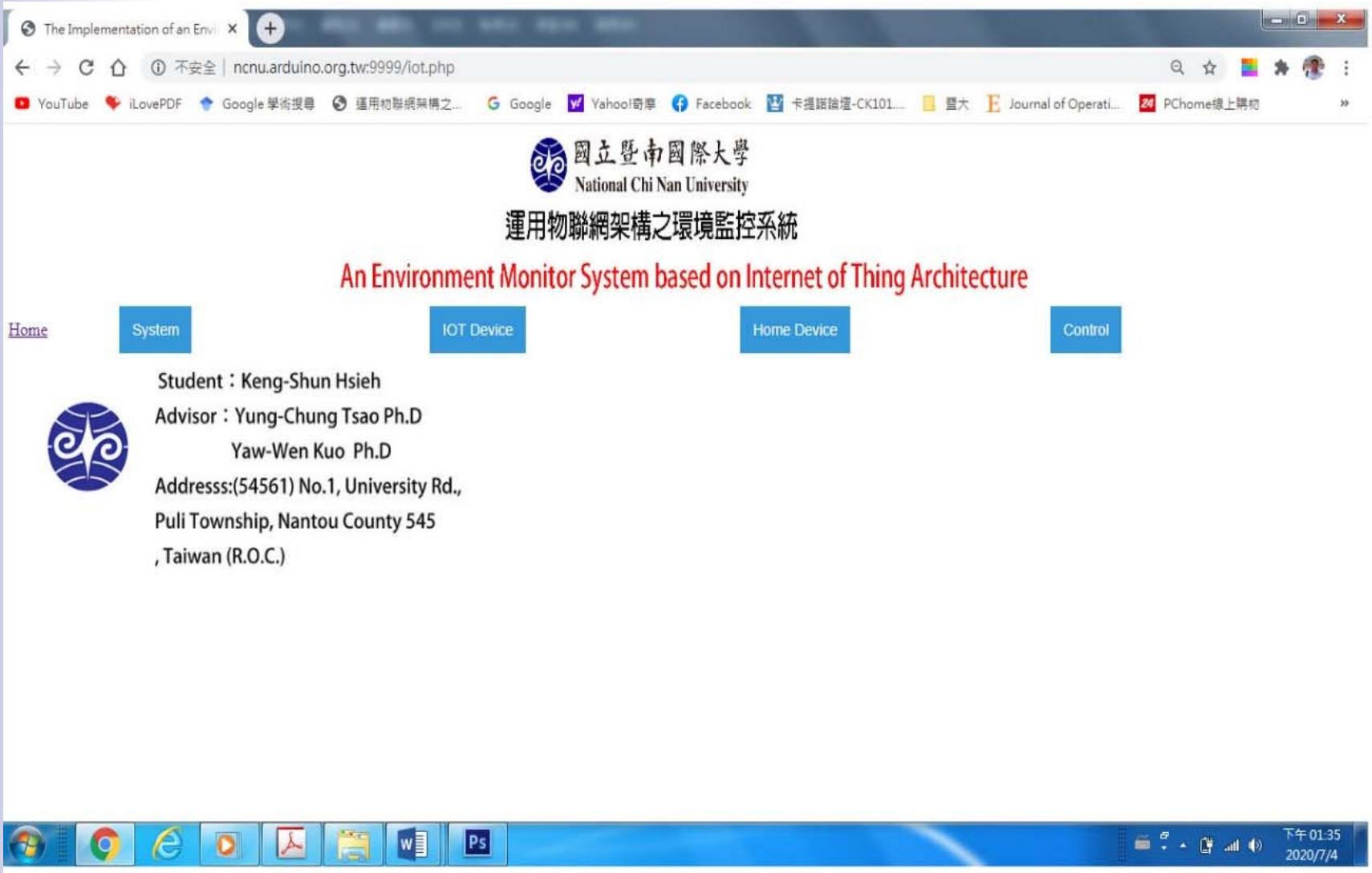


物聯網為基礎之系統架構圖 資料來源: 本研究整理

系統展示

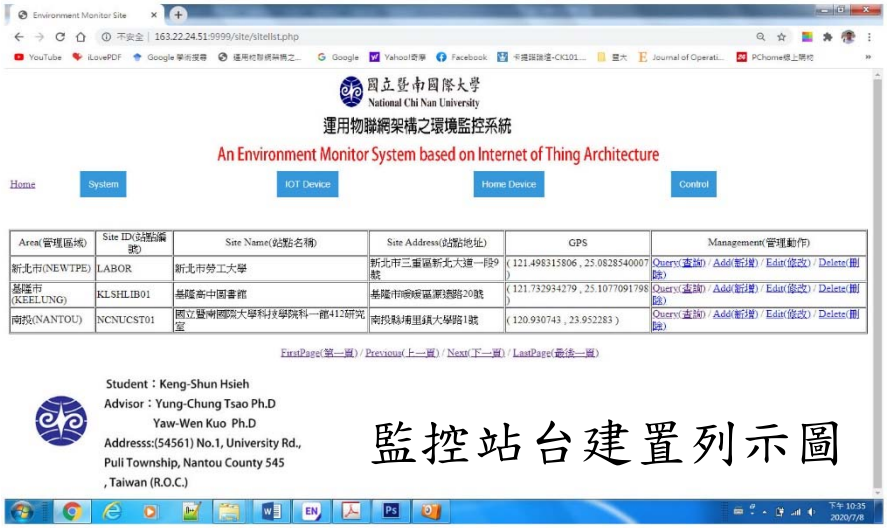
- 監控系統平台首頁
- 系統功能選項
- 工業型裝置選項
- 家用型裝置選項

監控系統平台首頁

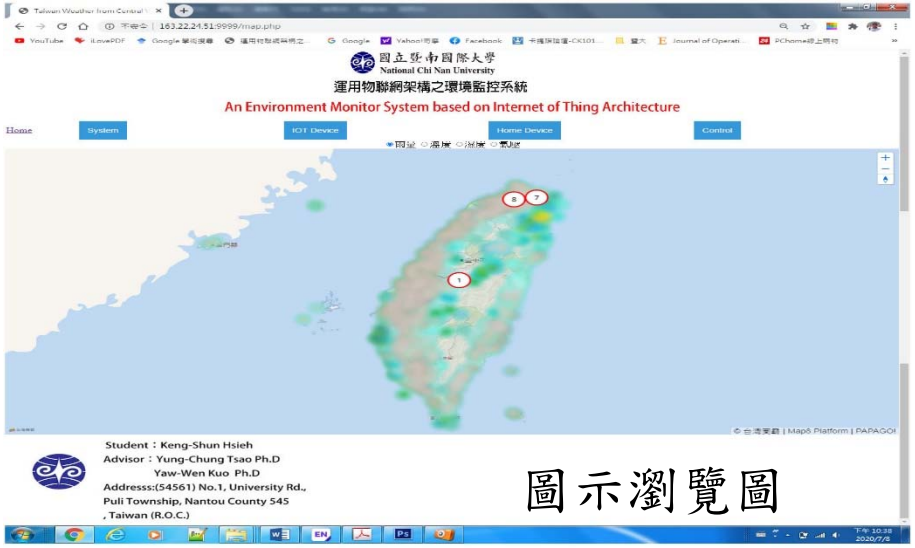

The Implementation of an Envi
不安全 | ncnu.arduino.org.tw:9999/iot.php
YouTube
iLovePDF
Google 學術搜尋
運用物聯網架構之...
Google
Yahoo!奇摩
Facebook
卡提諾論壇-CK101....
暨大
Journal of Operati...
PChome線上購物
國立暨南國際大學
National Chi Nan University
運用物聯網架構之環境監控系統
An Environment Monitor System based on Internet of Thing Architecture
Home
System
IOT Device
Home Device
Control
Student：Keng-Shun Hsieh
Advisor：Yung-Chung Tsao Ph.D
Yaw-Wen Kuo Ph.D
Addresss:(54561) No.1, University Rd.,
Puli Township, Nantou County 545
, Taiwan (R.O.C.)
下午 01:35
2020/7/4

系統功能選項

系統首頁選項圖



監控站台建置列示圖

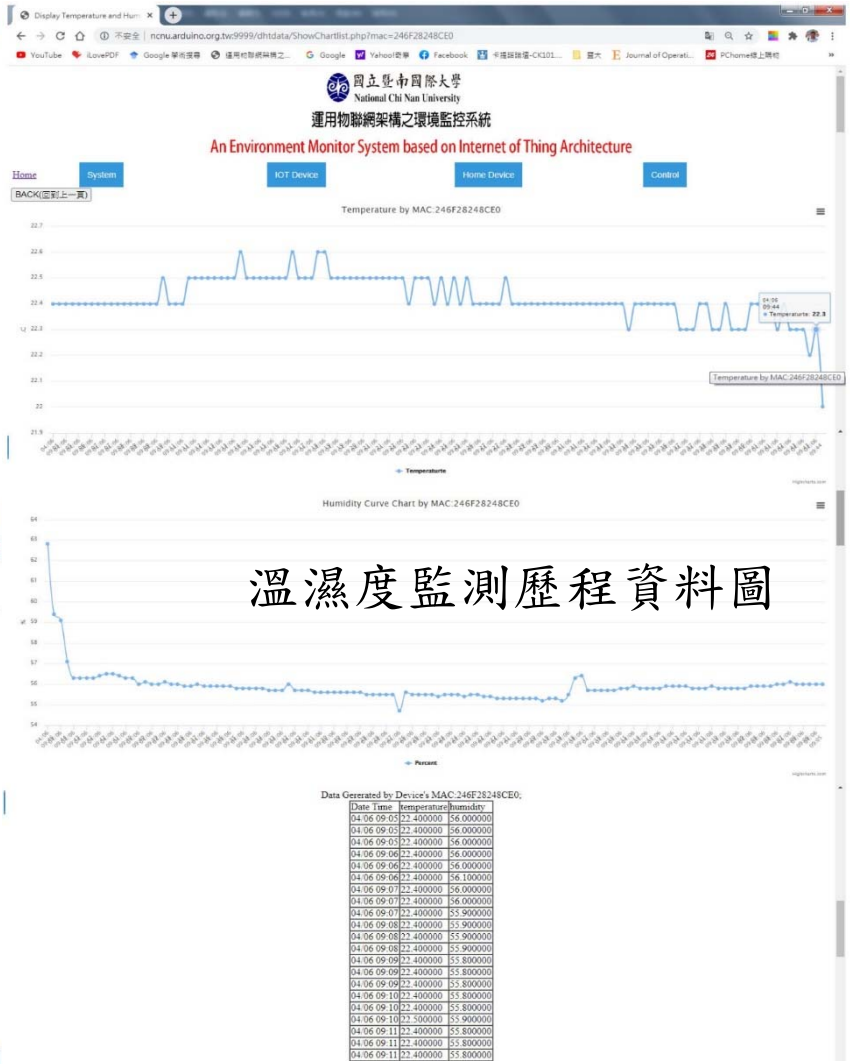


圖示瀏覽圖

工業型裝置選項

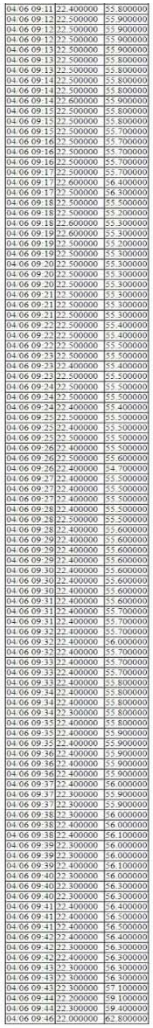
工業型裝置首頁選項圖

感測裝置站台列示圖



溫濕度監測歷程資料圖

工業型裝置選項



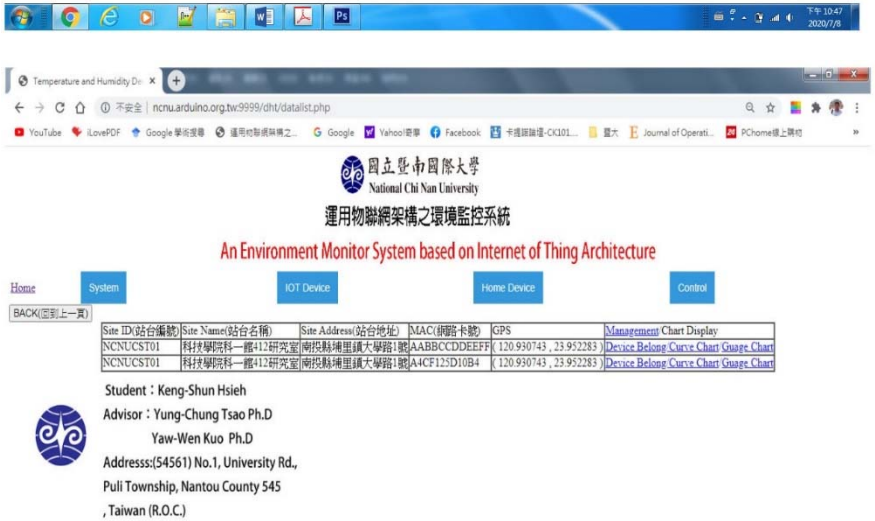
Student：Keng-Shun Hsieh
Advisor：Yung-Chung Tsao Ph.D
Yaw-Wen Kuo Ph.D
Addresss:(54561) No.1, University Rd.,
Puli Township, Nantou County 545
, Taiwan (R.O.C.)

溫濕度監測歷程資料圖

溫濕度監測值圖

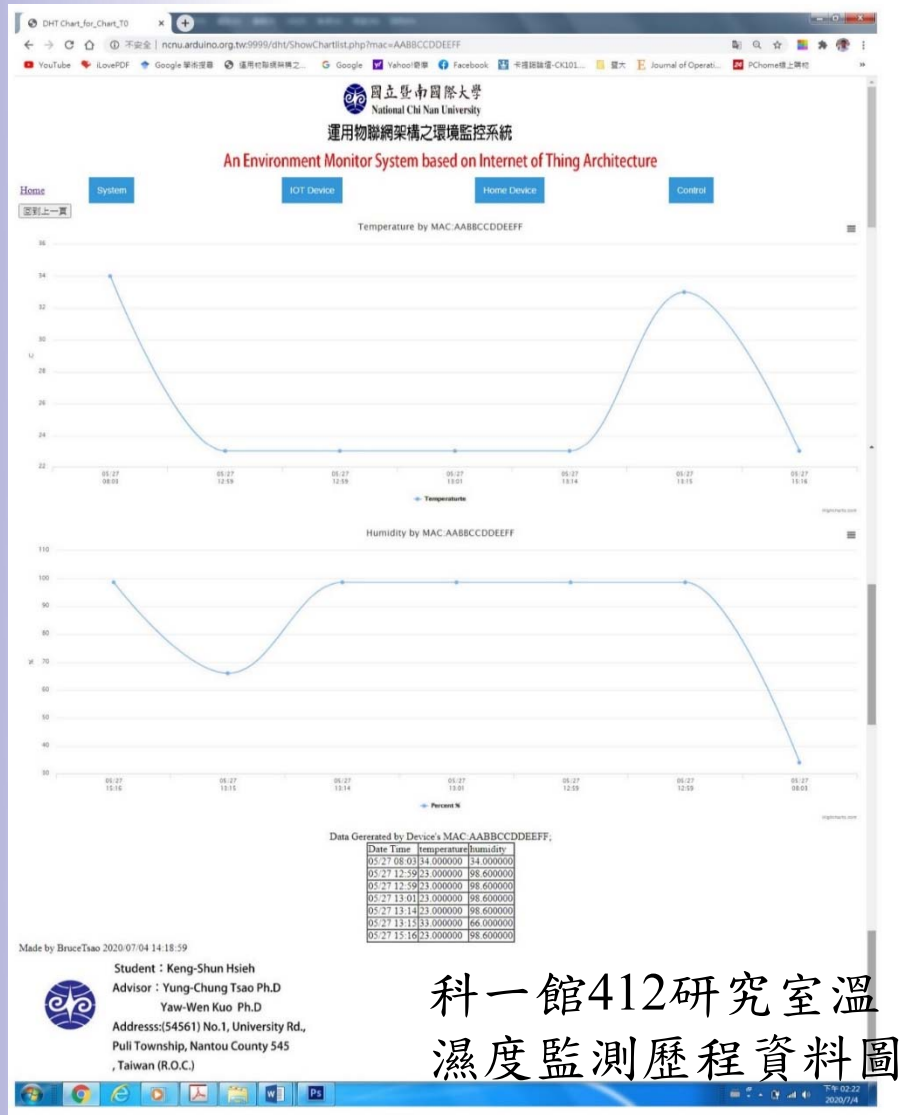
家用型裝置選項-溫濕度

家用型裝置首頁圖

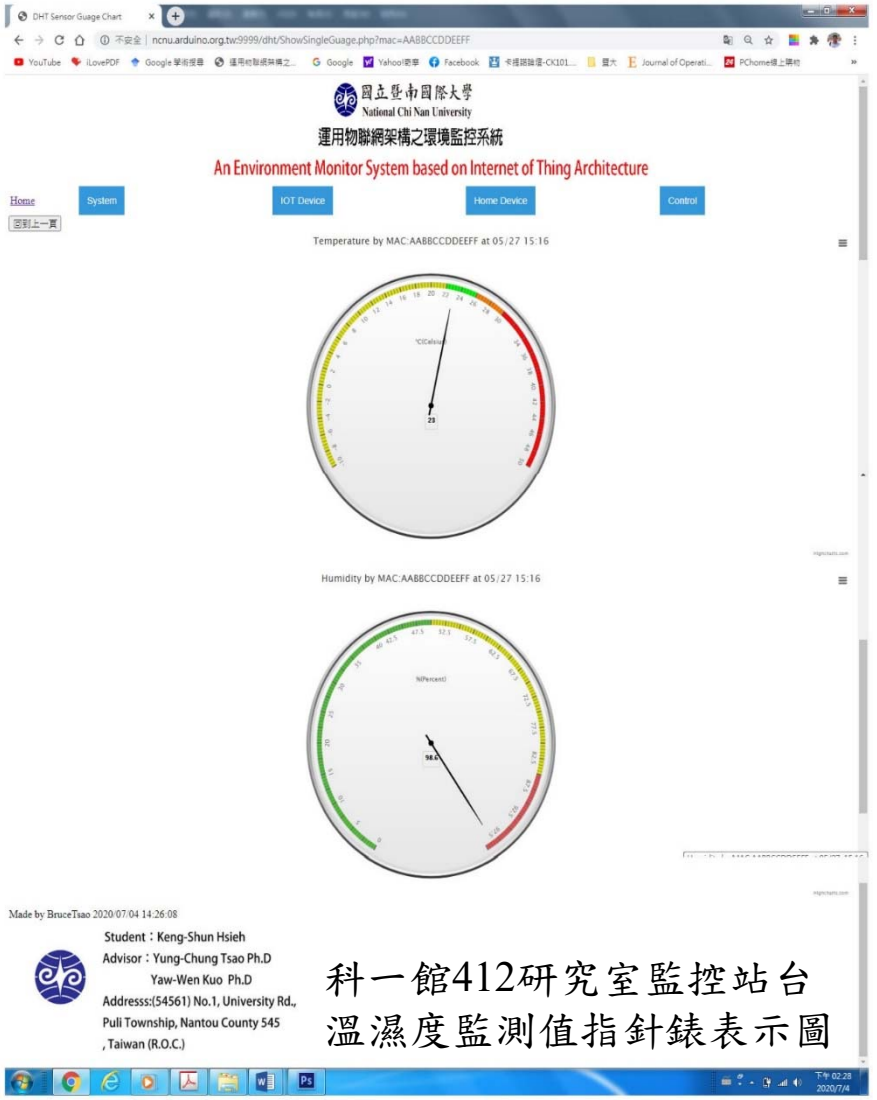


溫濕度感測裝置站台列示圖

家用型裝置選項-溫濕度

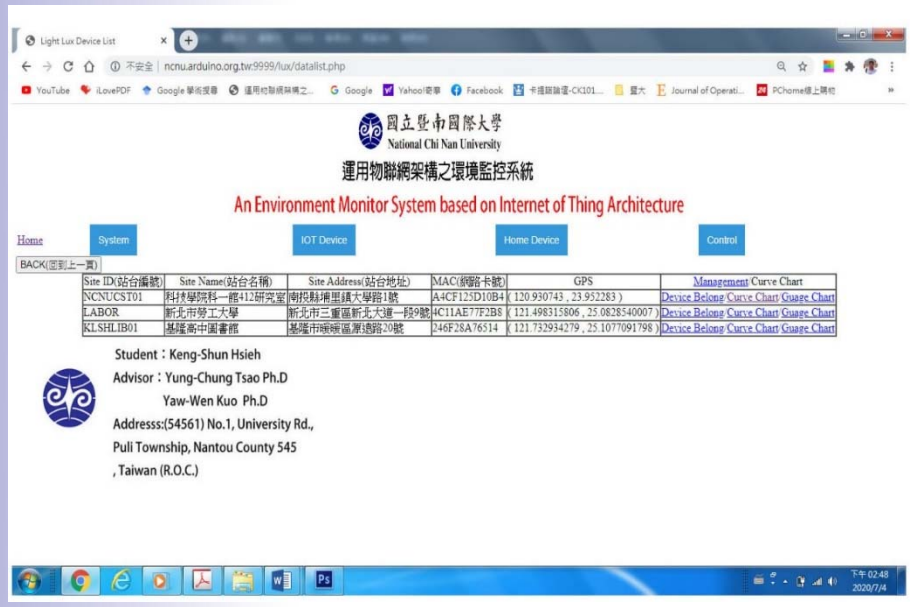


科一館412研究室溫濕度監測歷程資料圖

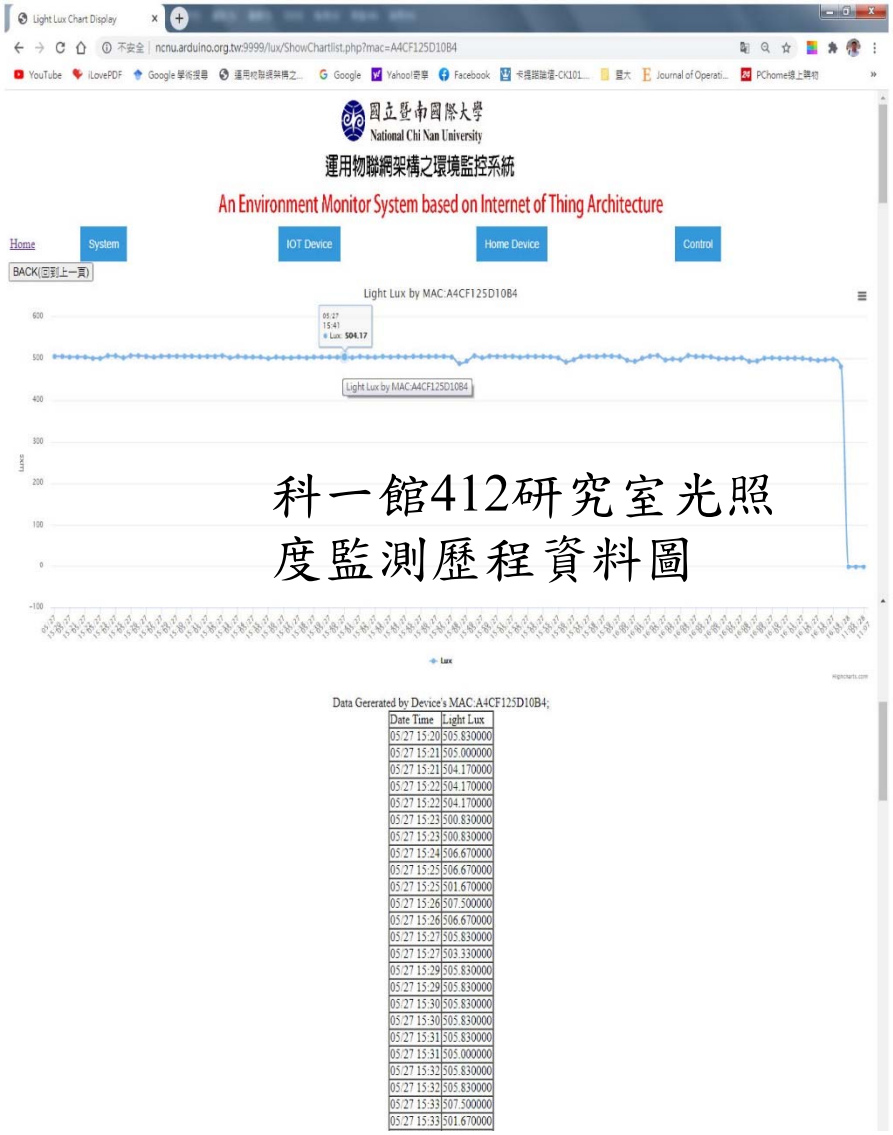


科一館412研究室監控站台溫濕度監測值指針錶表示圖

家用型裝置選項-光照度

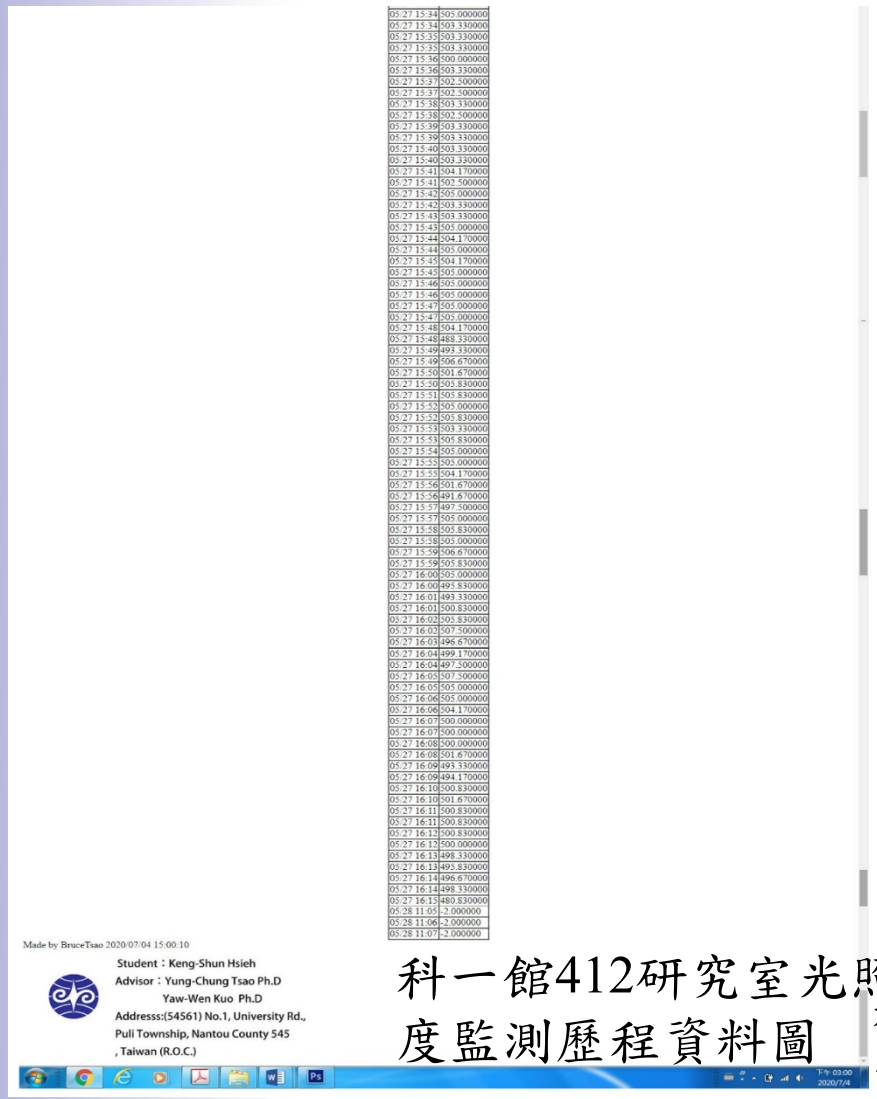


光照度監測裝置站台列示圖



科一館412研究室光照度監測歷程資料圖

家用型裝置選項-光照度



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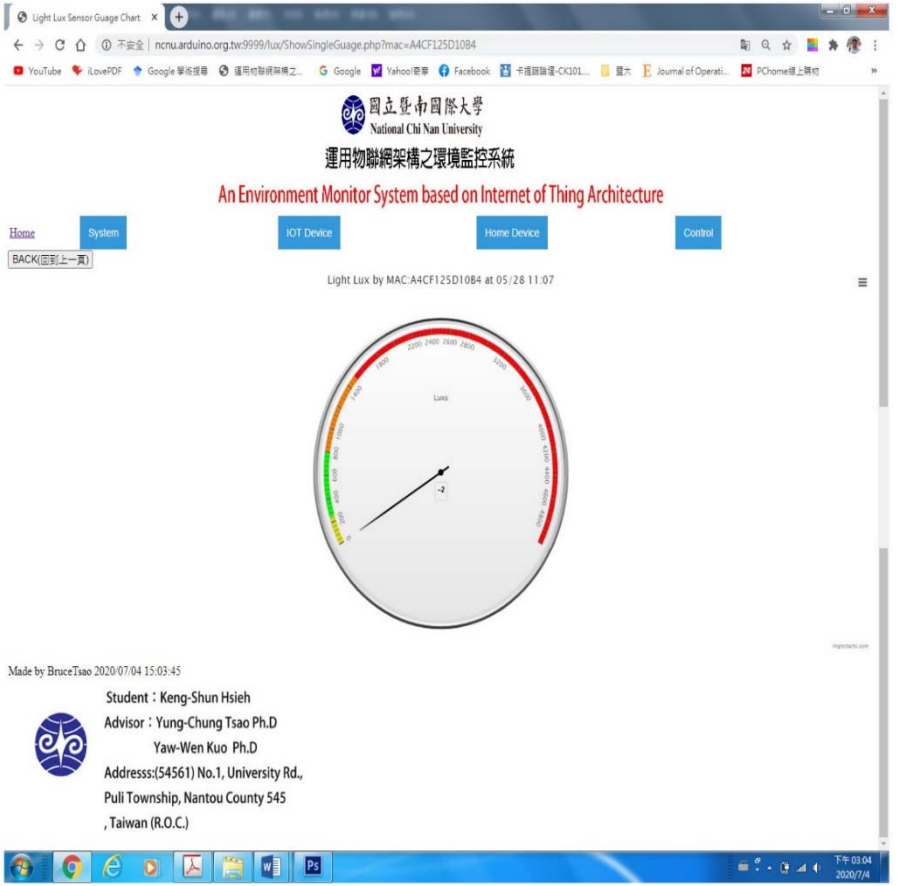
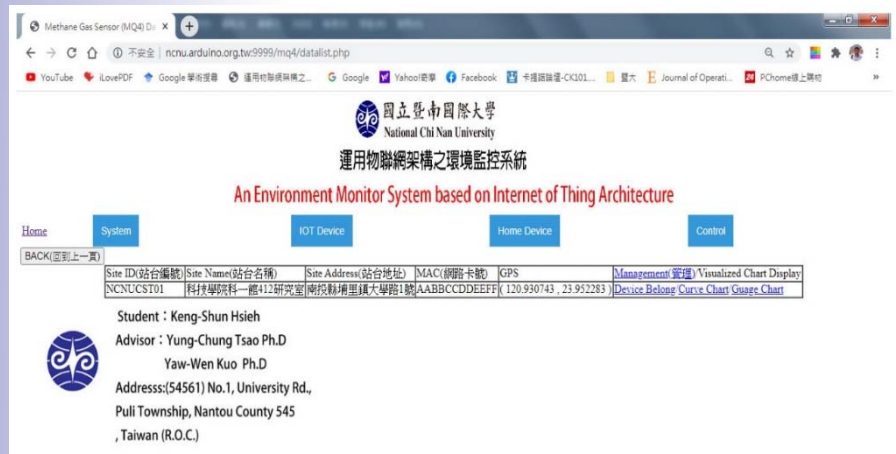


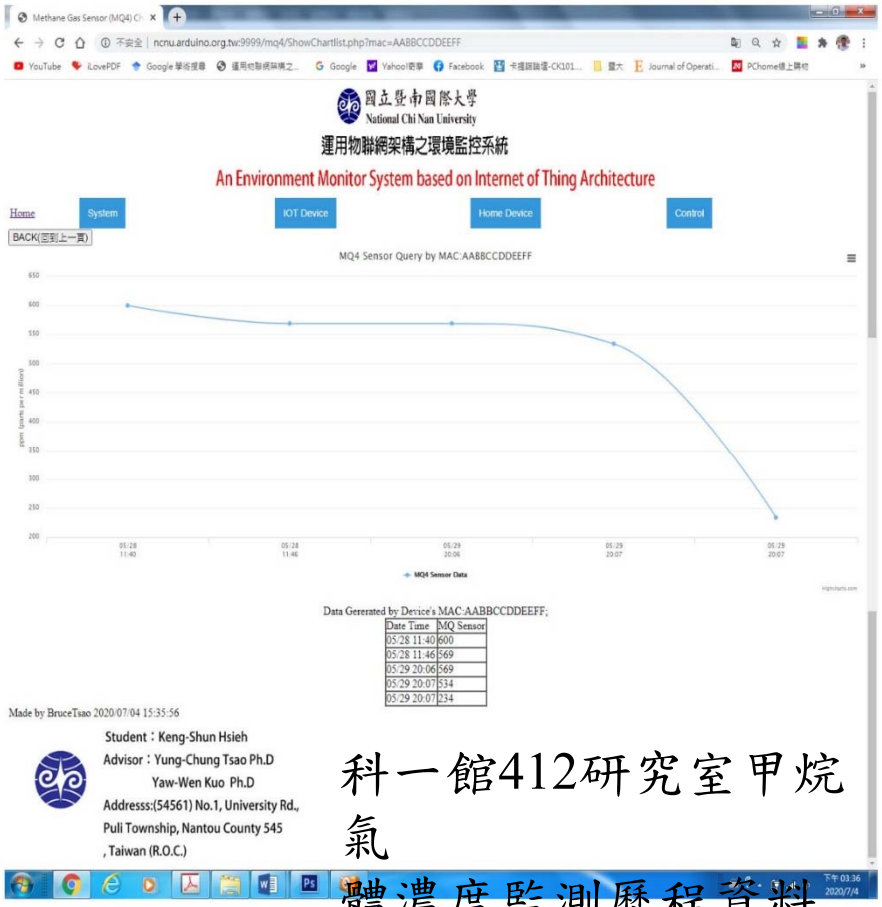
科一館412研究室光照度監測值指針錶表示圖

家用型裝置選項-甲烷氣體濃度



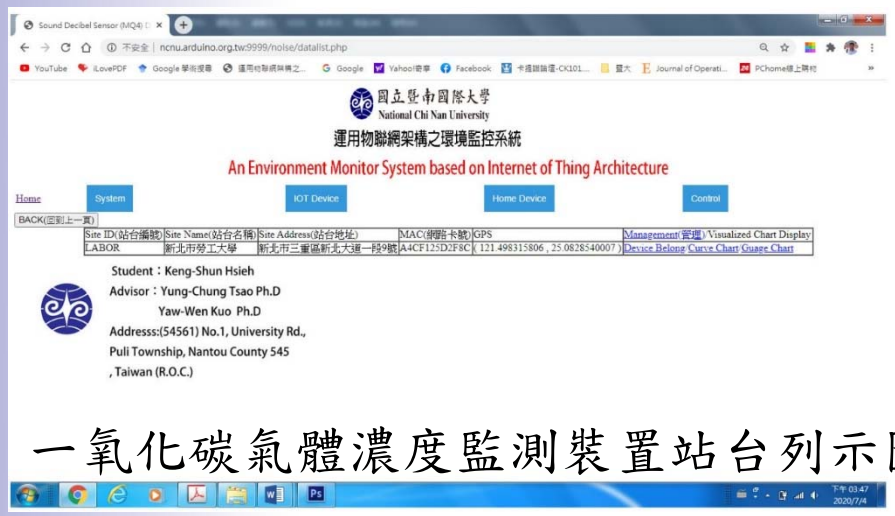
甲烷氣體濃度監測裝置站台列示圖

甲烷氣體濃度監測值指針錶表示圖

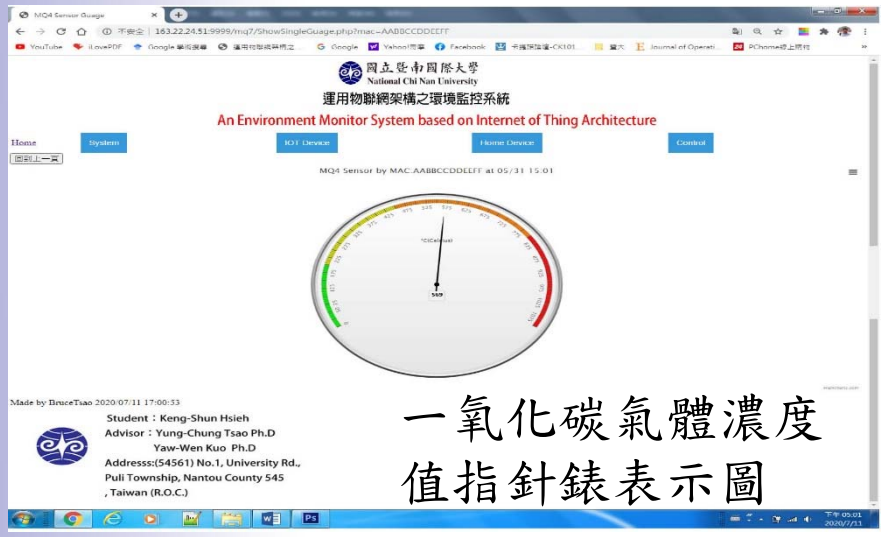


科一館412研究室甲烷氣體濃度監測歷程資料圖

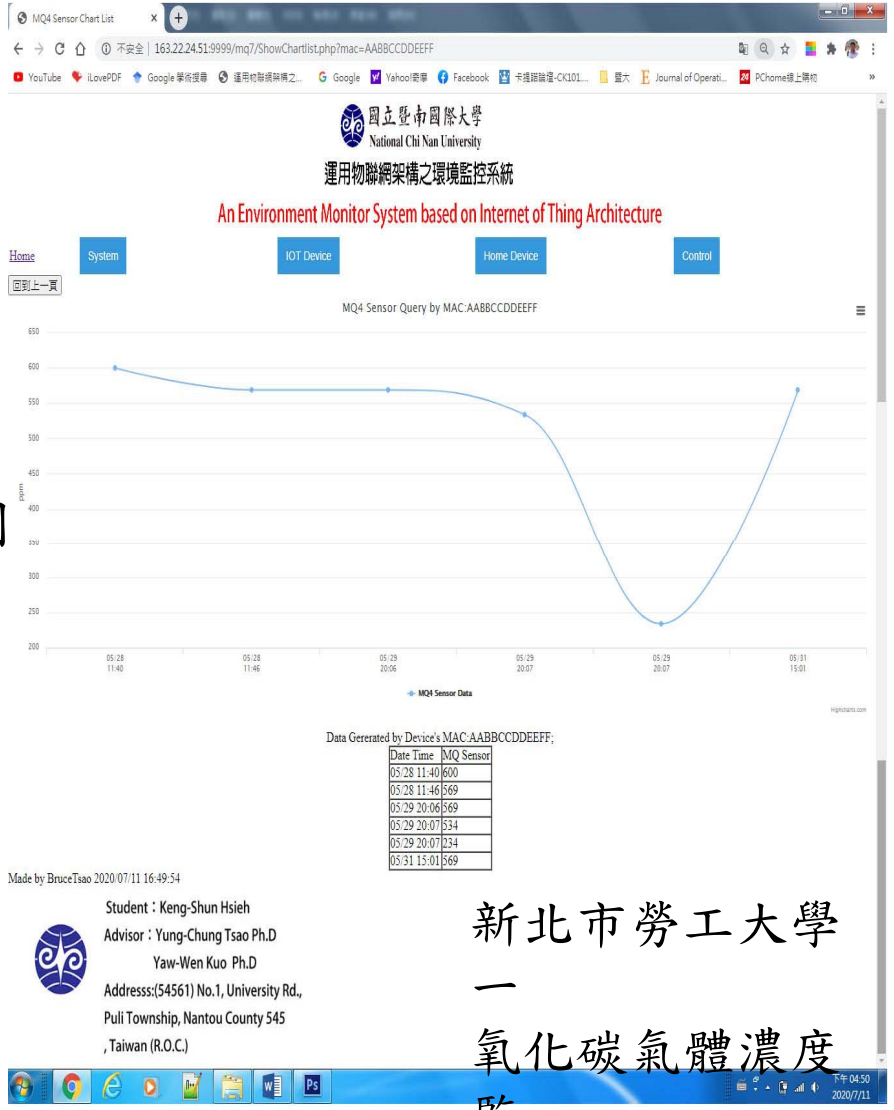
家用型裝置選項--一氧化碳氣體濃度



一氧化碳氣體濃度監測裝置站台列示圖

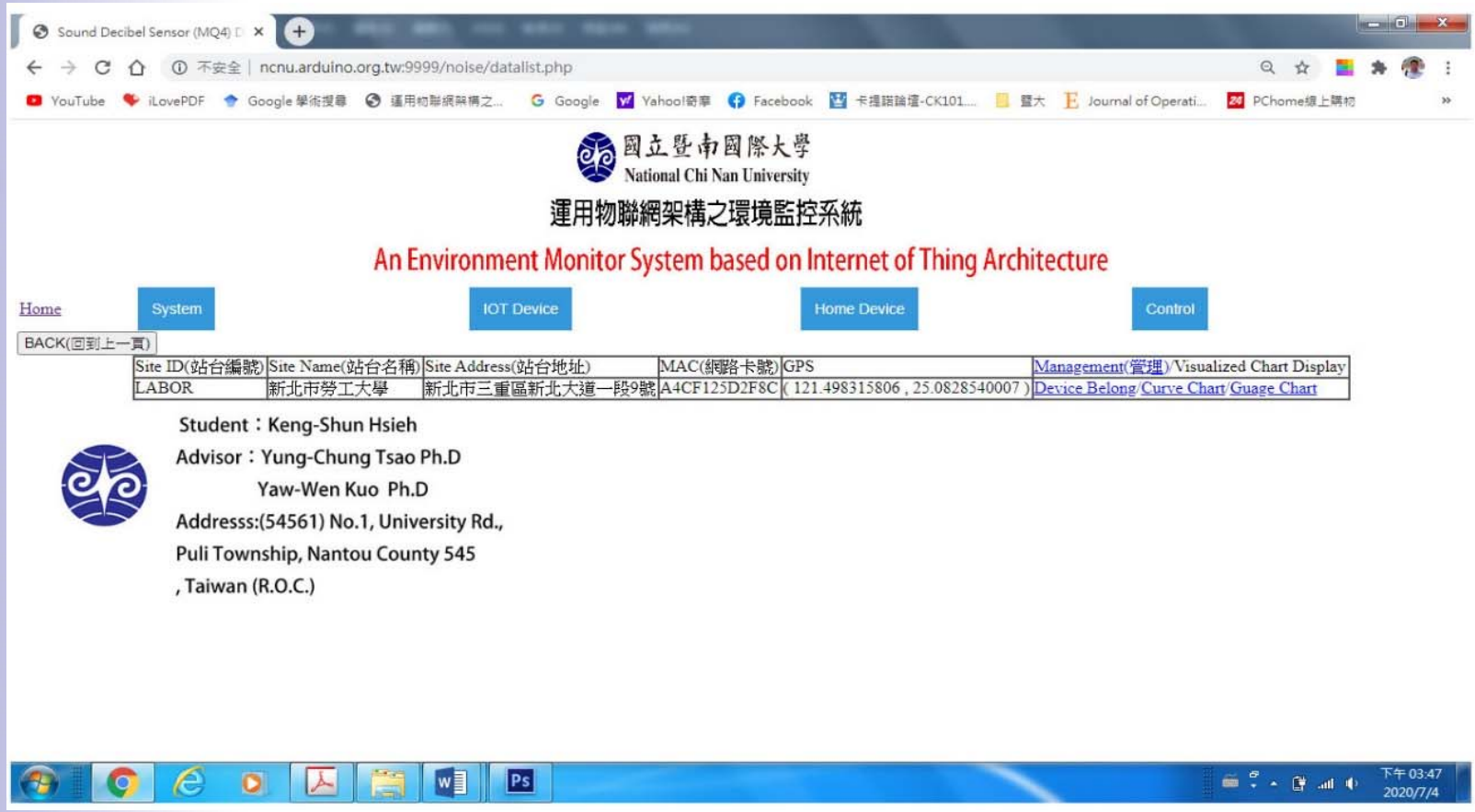


一氧化碳氣體濃度值指針錶表示圖



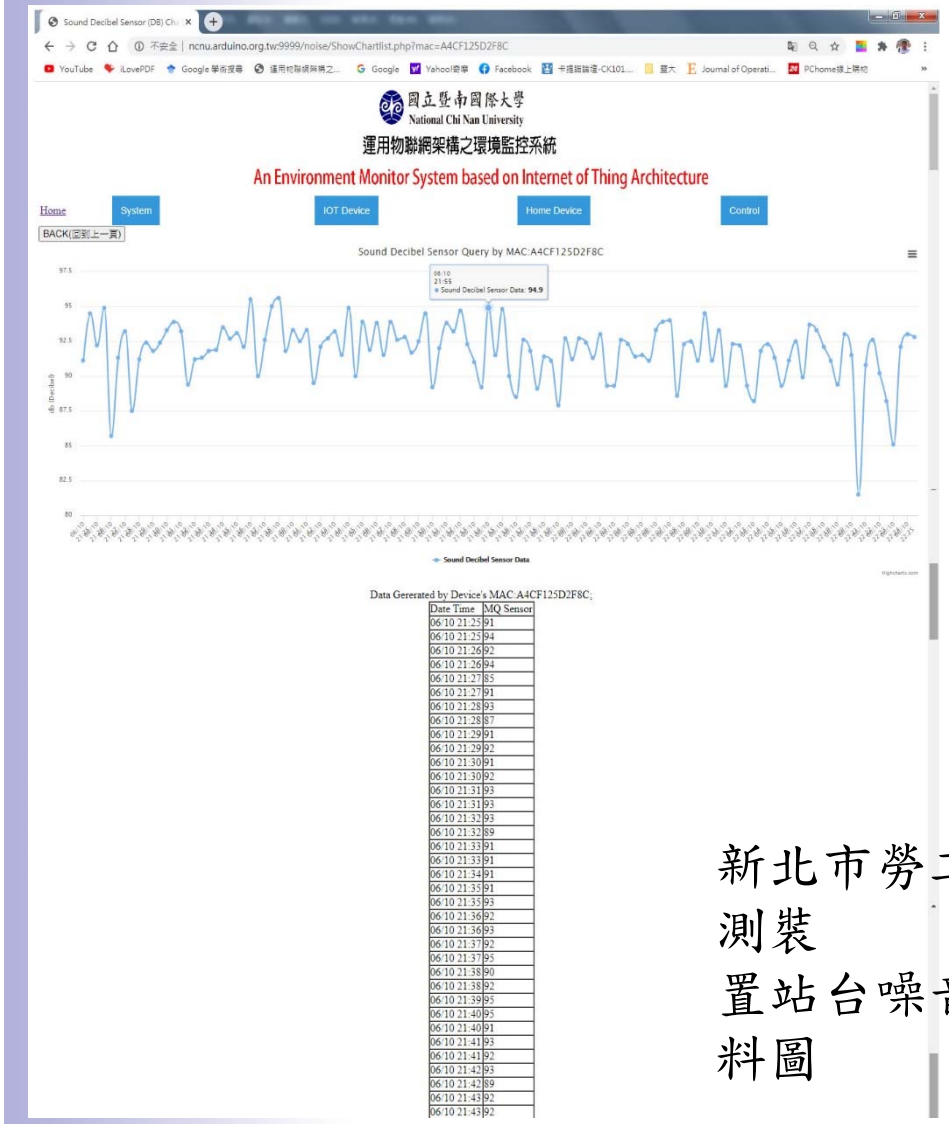
新北市勞工大學一氧化碳氣體濃度監測歷程資料圖

家用型裝置選項-噪音

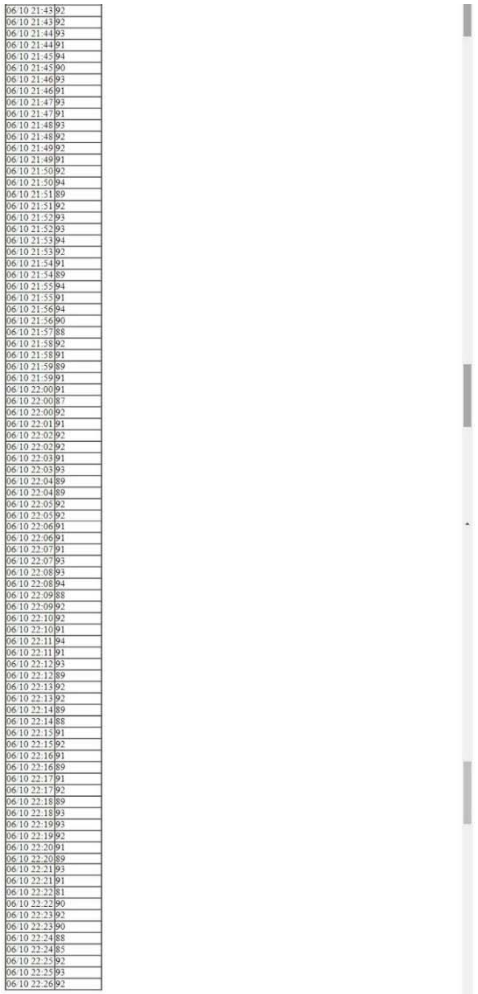


噪音監測裝置站台列示圖

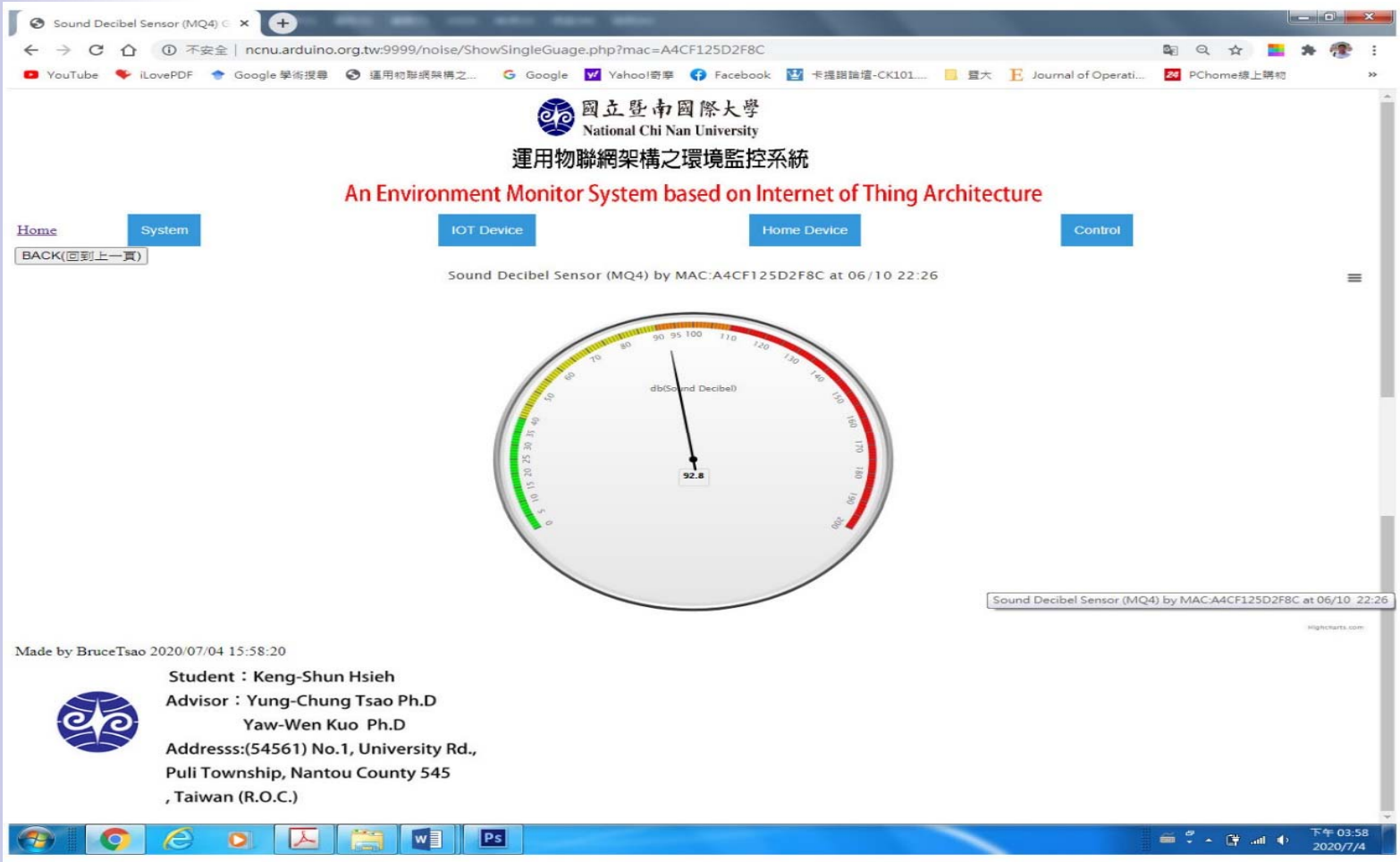
家用型裝置選項-噪音



新北市勞工大學噪音監測裝置站台噪音監測歷程資料圖



家用型裝置選項-噪音



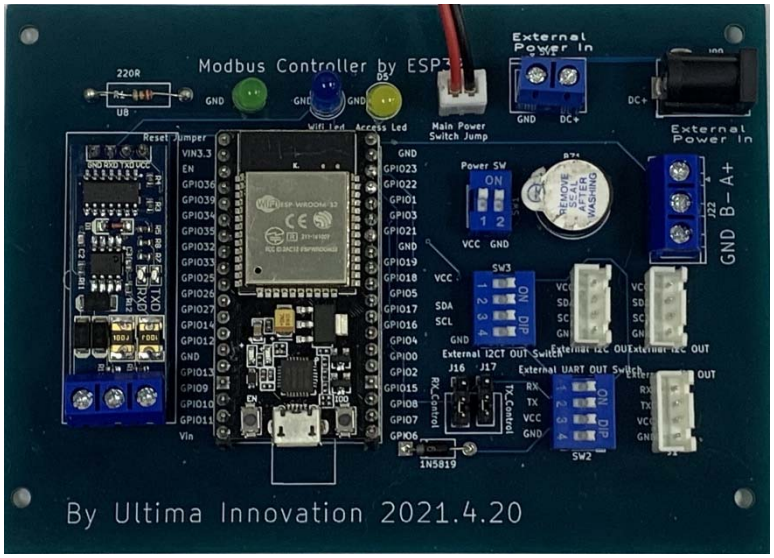
新北市勞工大學噪音監測值指針錶表示圖

分散式顯示裝置開發

點陣式大型螢幕

We Design


吳厝國小綠能書屋
液晶顯示器
246F289E432C/lib-tre
IP:192.168.0.170
1.20/180/24.00/64.00
MQTT Sent success..


Modbus Controller by ESP
External Power In
Main Power Switch Jump
Power SW
External I2CT OUT Switch
External UART OUT Switch
By Ultima Innovation 2021.4.20


VCC GND A+ B-
By Ultima Innovation 2021.4.12


吳厝國小綠能書屋
綠能書屋太
ASUS
Speed:0.5
West North
21.0°C
72.0 %

DATA Collector

Wind speed

Wind direction

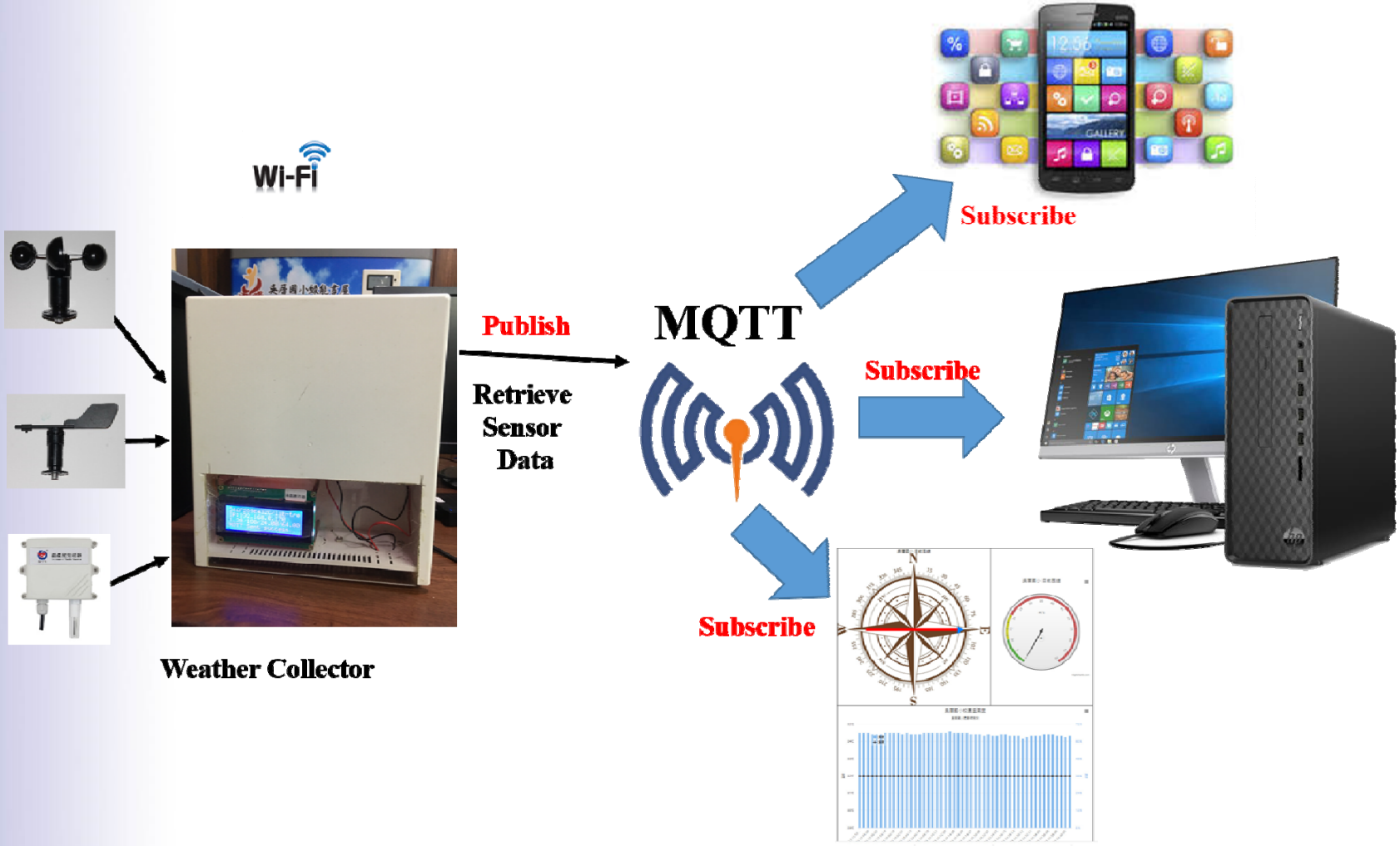
Temperature & humidity

Controller

RS-485 hub

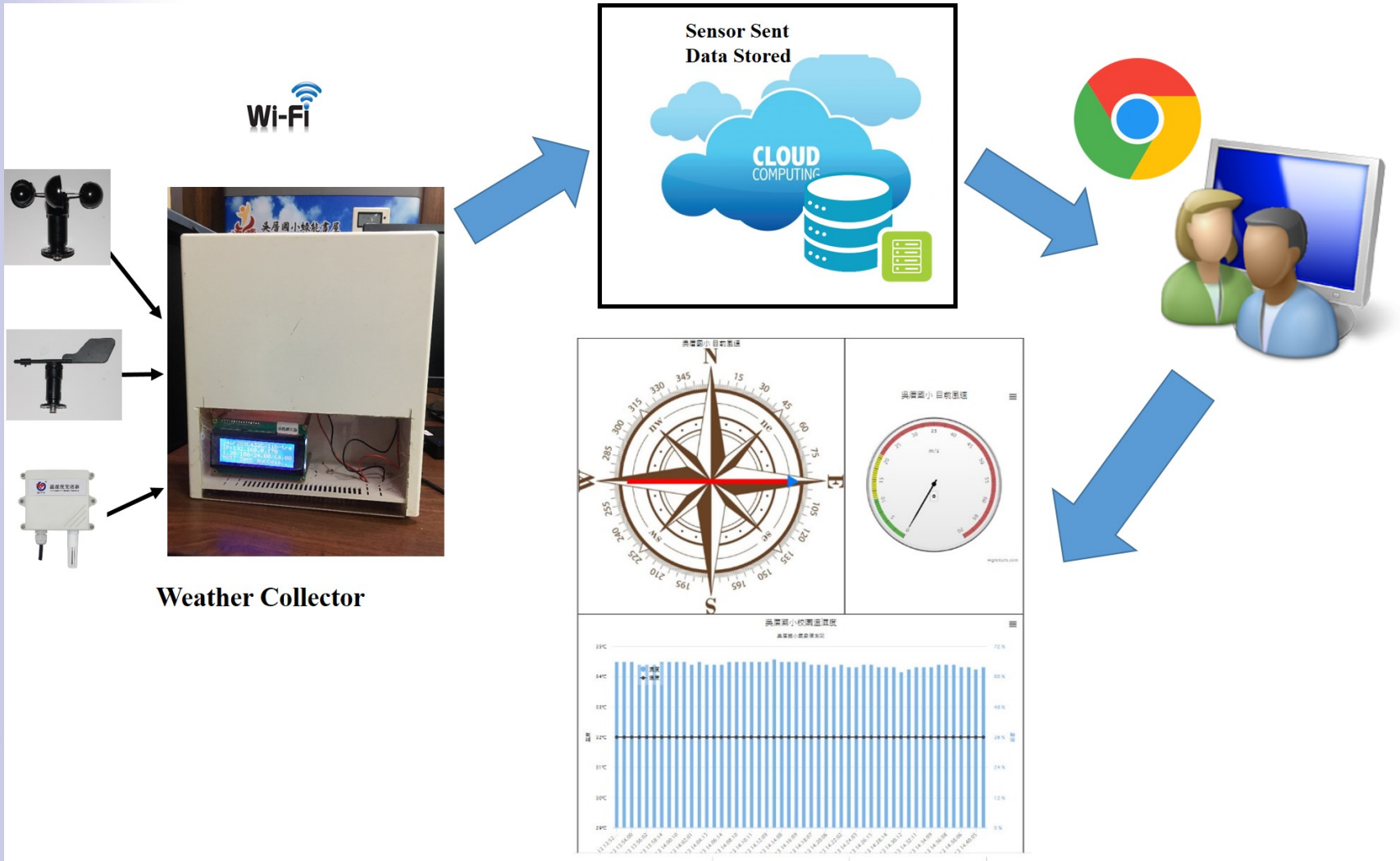
Control box

MQTT Broker

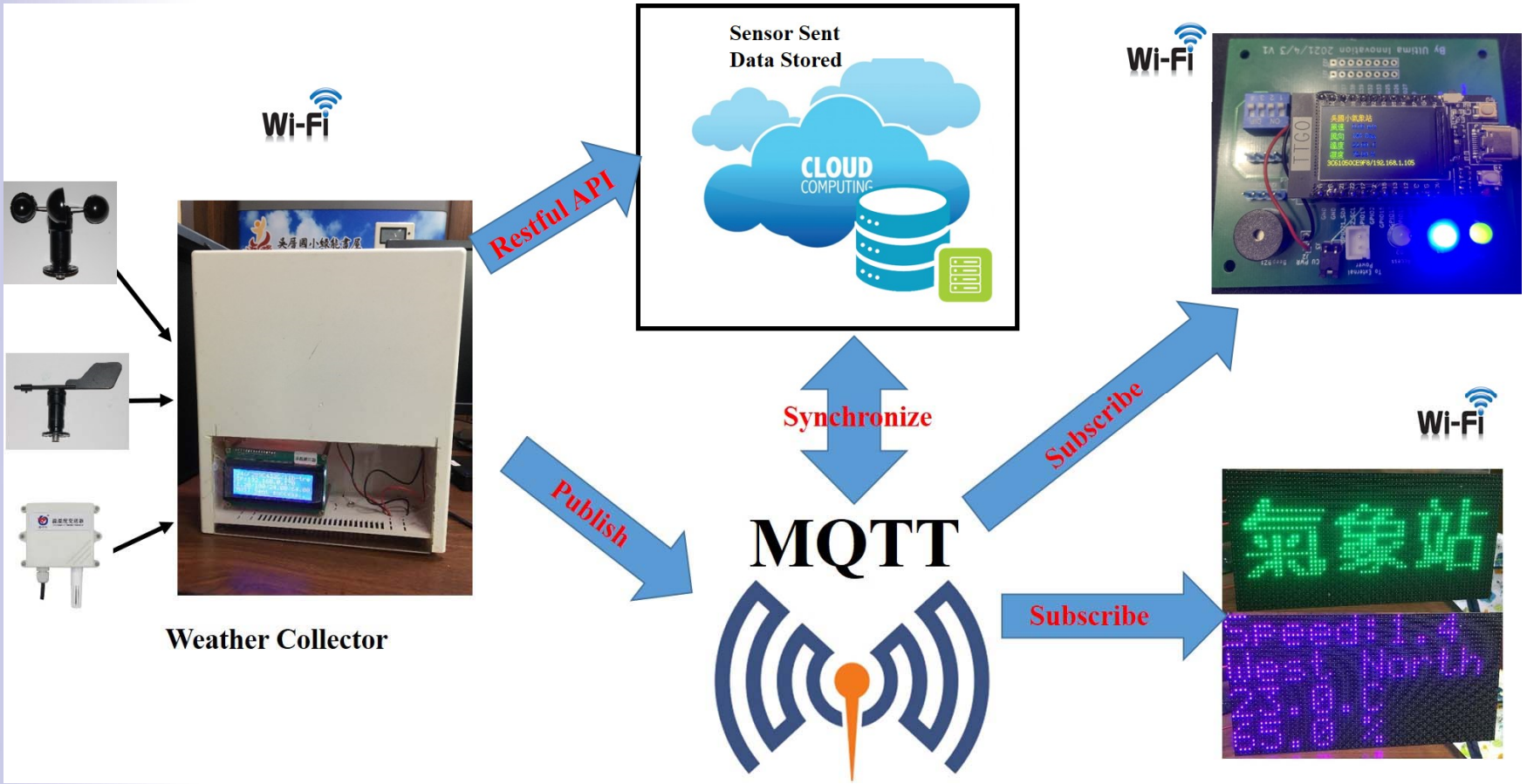

Wi-Fi
Publish
Retrieve
Sensor
Data
MQTT
Subscribe
Subscribe
Subscribe
Weather Collector

System Design

Original System Architecture



IOT-based System Architecture



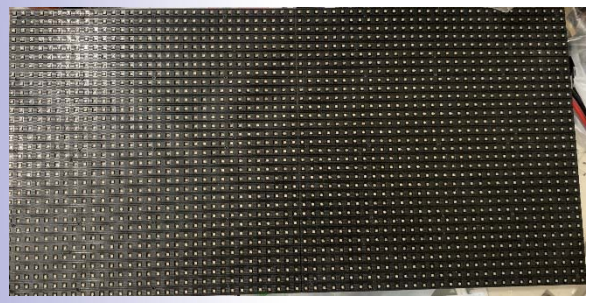
Comparison

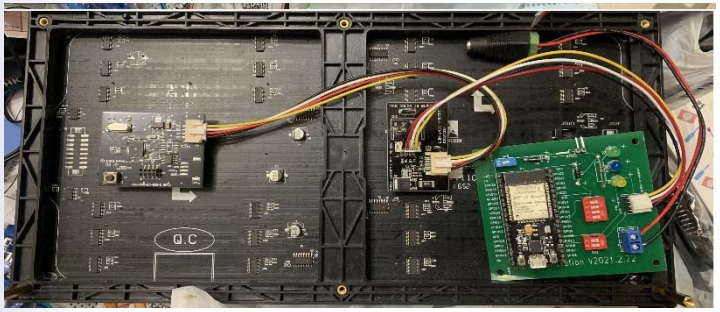
	Advantages	Disadvantages
Original System Architecture	Users can use any internet-based equipment via Internet to access web-site and query sensor data with browsers in passive way	Those information still can't be delivered to users who hope to get such information with initiative and automatic way.
IOT-based System Architecture	Under the above-mentioned architecture, all information transmission become very transparent and quick-response to other independent devices without any PC or browsers supporting.	◆ Requires more processing power and more memory. ◆ Limits the scalability as each client devices. ◆ Centralized broker limits the scalability as each client devices

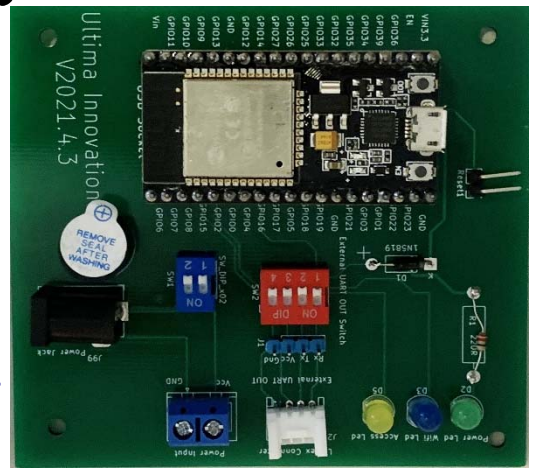
Implementation System

Large Size Display Design

- The study integrates the proposed visualized large-size display based on RGB led dot matrix and proposed controller as shown in Fig 9 to enhance original system



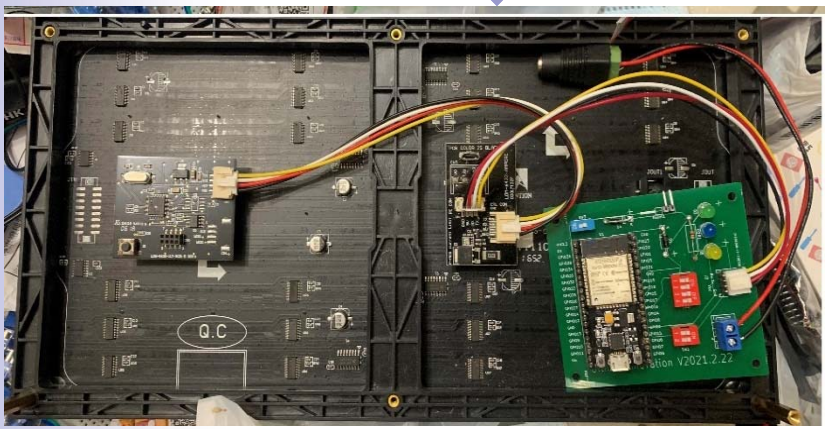




Large Size Display Design

RGB LED Dot Matrix Display

Proposed Controller

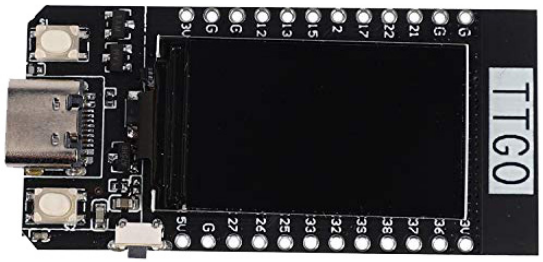


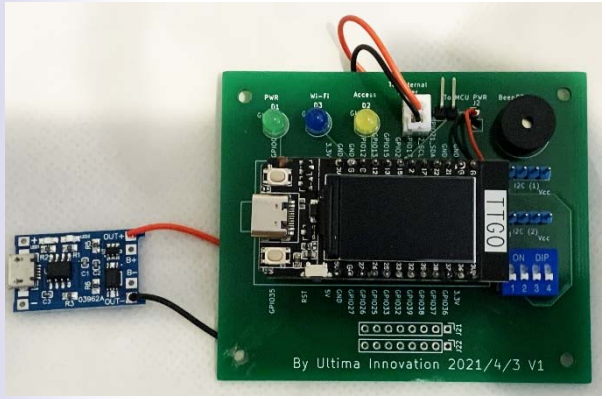
Integrate Controller with RGB led dot matrix display

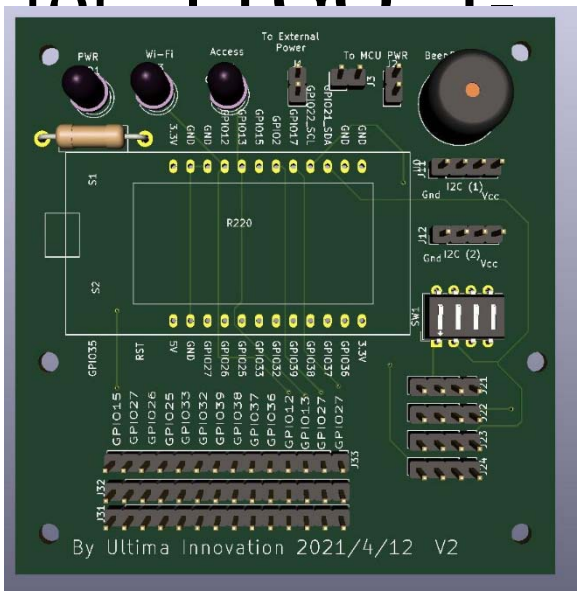
Integration Weather Station with Dot Matrix Display

Large Size Display Design

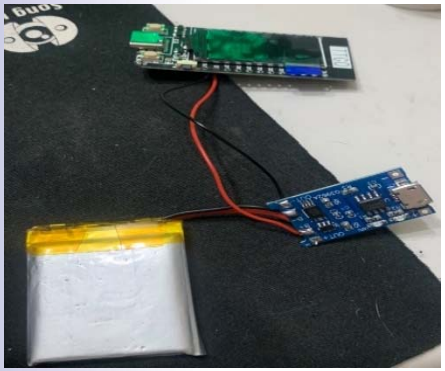
- use uses LILYGO ® TTGO T-Display as MCU and TFT as mini display.
- Designs and Implementations a circuit and layouts a PCB as a shield for TTGO T-

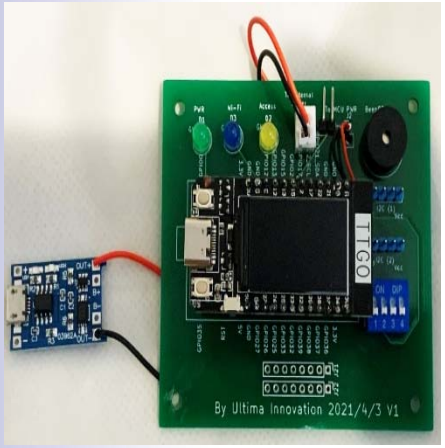




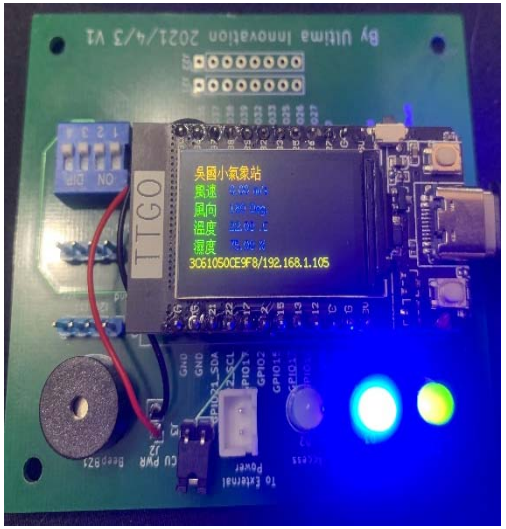


Portable Display Design

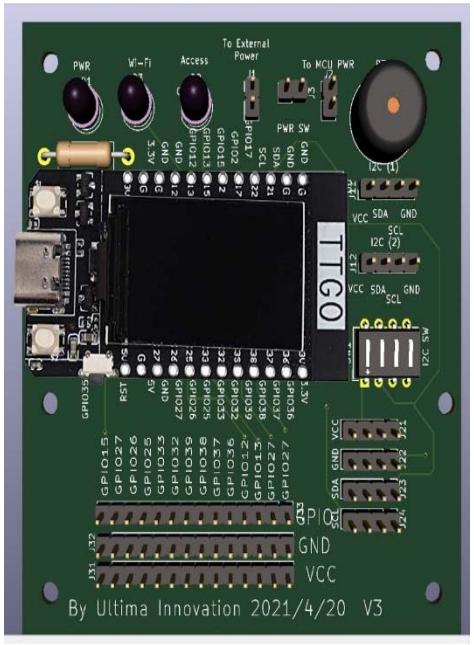




RS-485 HUB Circuit and PCB Layout



Running of the Portable Display Design

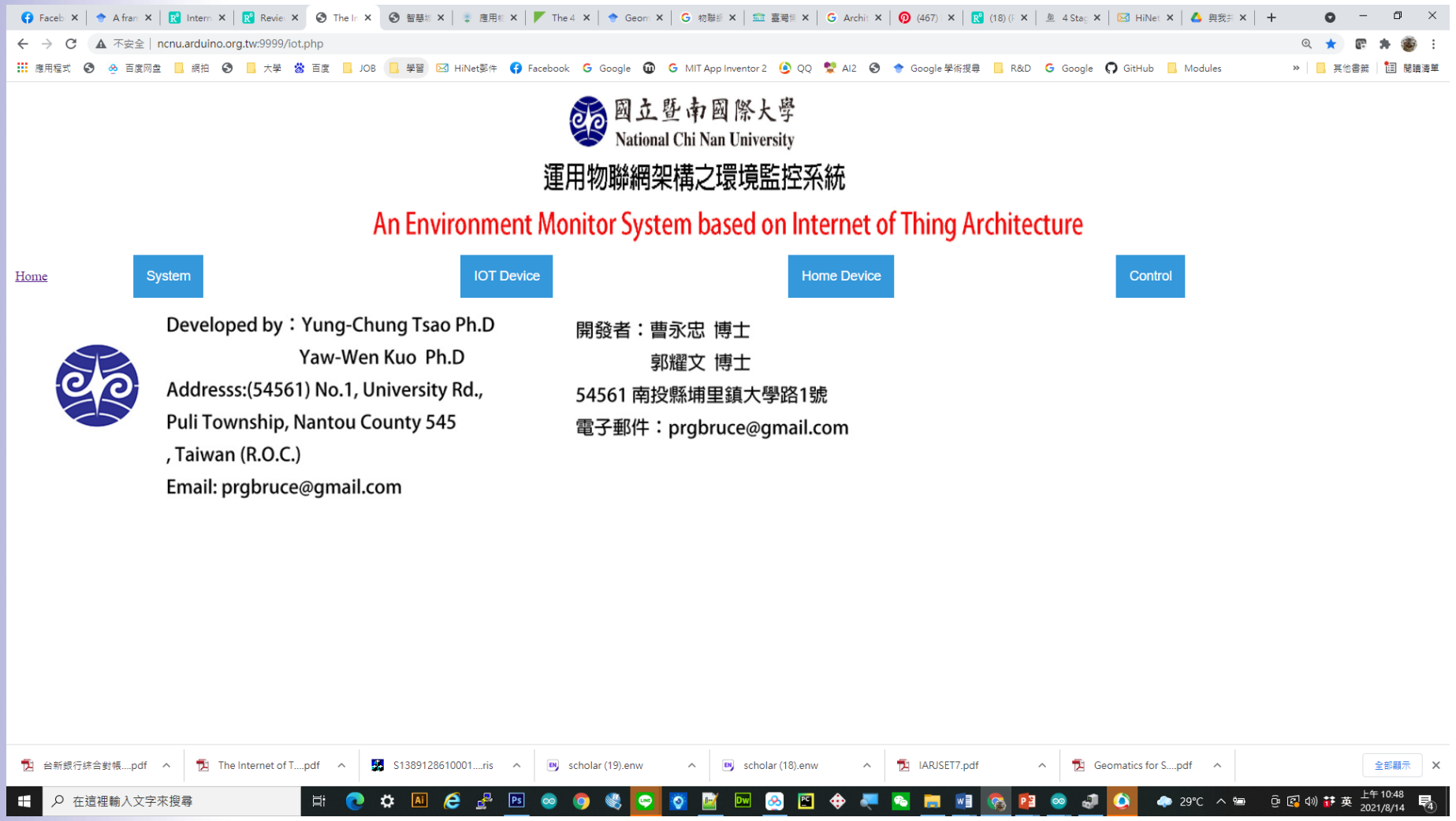


Advanced Version of
the Portable Display Design

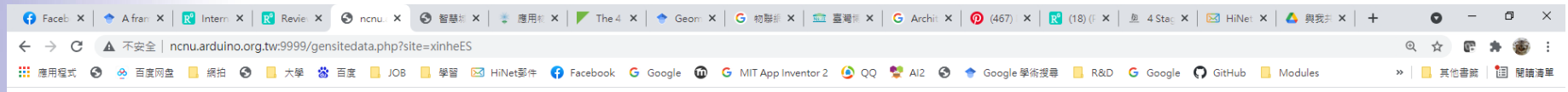
開放式資料界街架構

研究平台

雲端站台


不安全 | ncnu.arduino.org.tw:9999/iot.php
國立暨南國際大學
National Chi Nan University
運用物聯網架構之環境監控系統
An Environment Monitor System based on Internet of Thing Architecture
Home
System
IOT Device
Home Device
Control
Developed by：Yung-Chung Tsao Ph.D
Yaw-Wen Kuo Ph.D
Addresss:(54561) No.1, University Rd.,
Puli Township, Nantou County 545
, Taiwan (R.O.C.)
Email: prgbruce@gmail.com
開發者：曹永忠 博士
郭耀文 博士
54561 南投縣埔里鎮大學路1號
電子郵件：prgbruce@gmail.com

開放性資料介面



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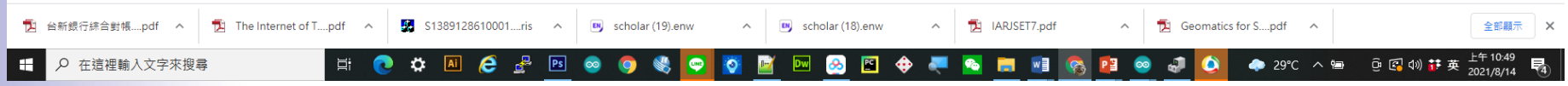

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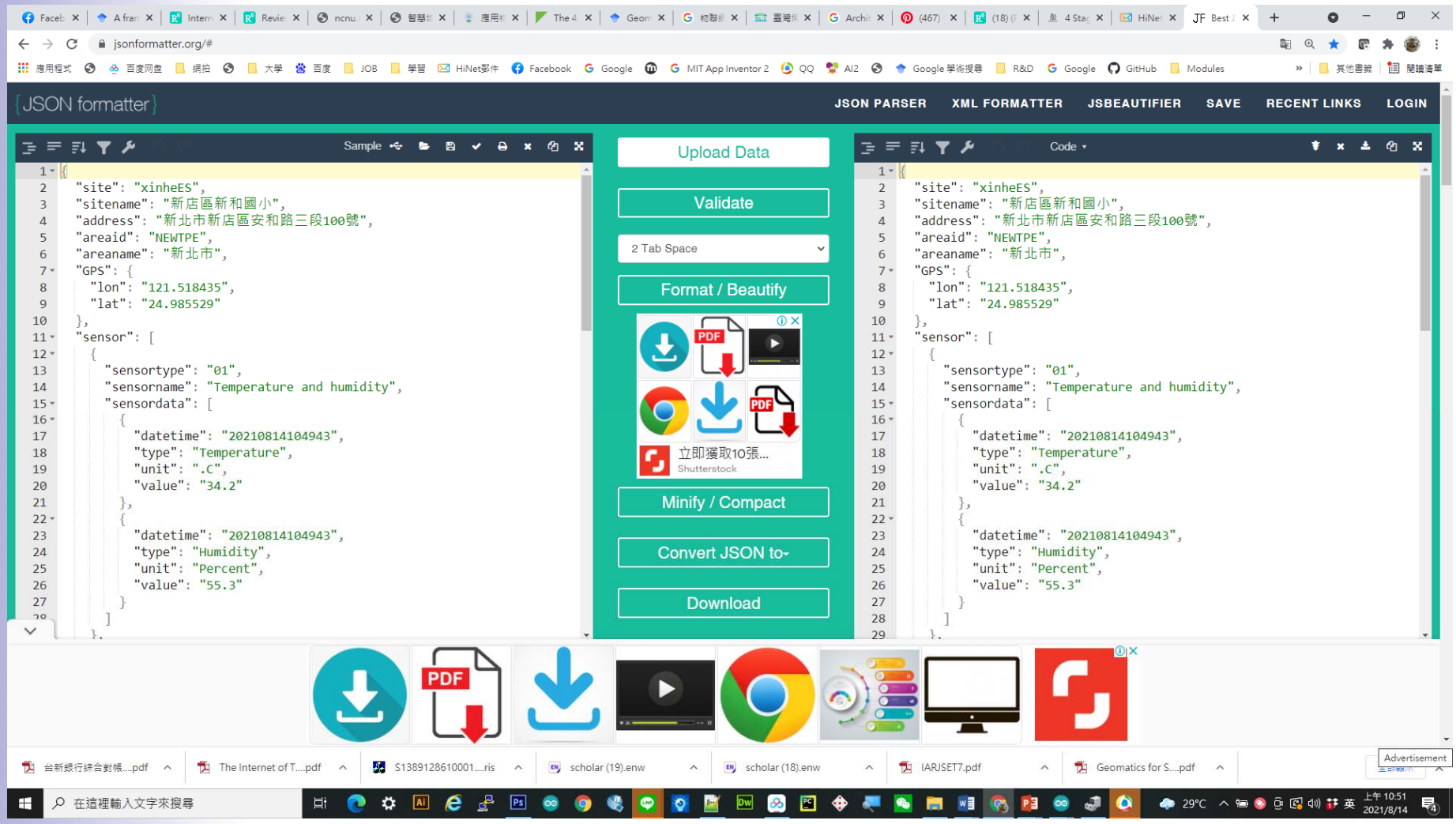
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JSON PARSER
XML FORMATTER
JSBEAUTIFIER
SAVE
RECENT LINKS
LOGIN
Sample
Code
Upload Data
Validate
2 Tab Space
Format / Beautify
Minify / Compact
Convert JSON to
Download
立即獲取10張...
Shutterstock
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Advertisement
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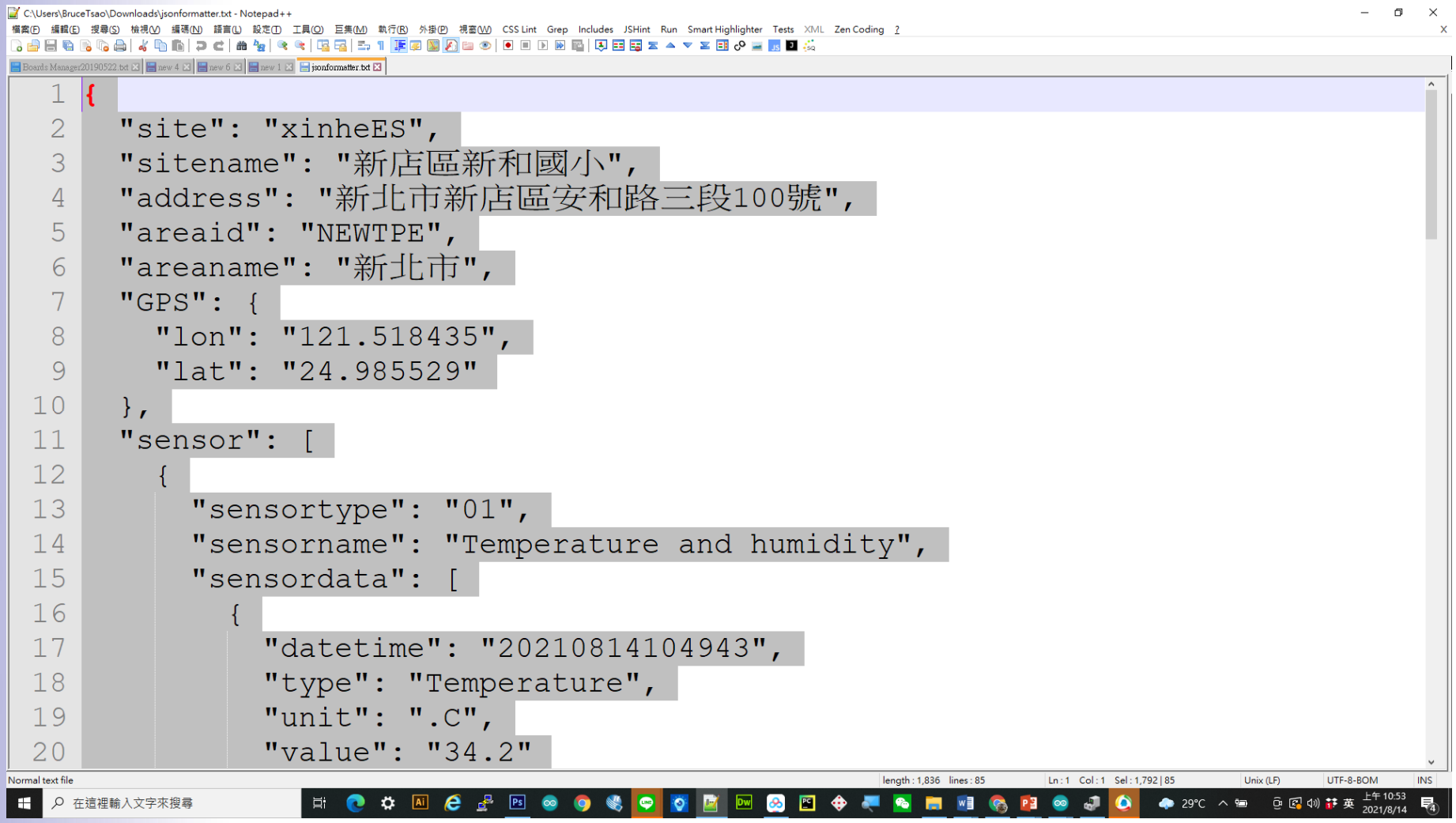
上午 10:51
2021/8/14

表準Ｊｓｏｎ資料格式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Ameba空氣盒子

空汙盒子開發

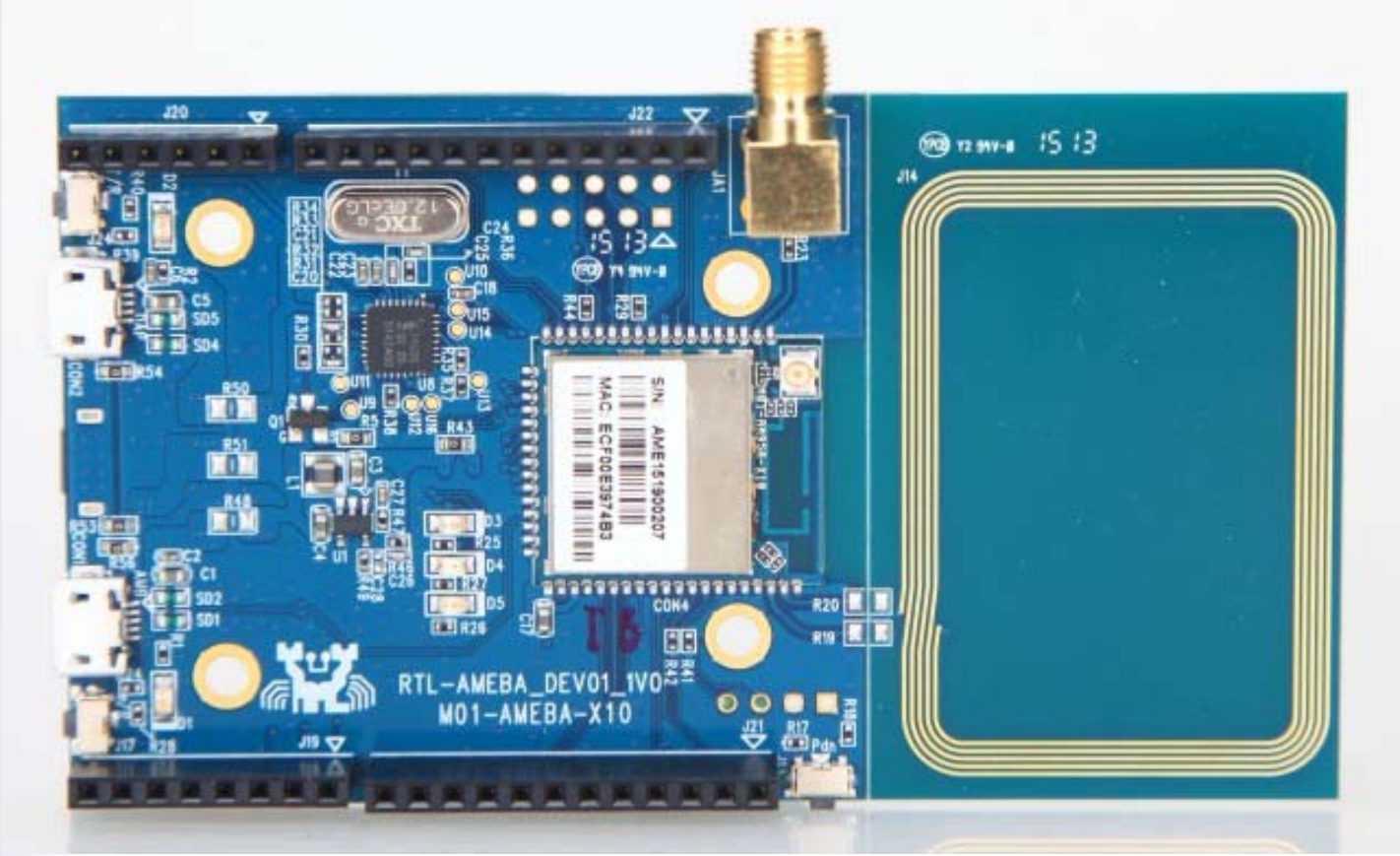
- 使用RealTek設計開發的Ameba 8195AM

組裝零件一覽(1/6)

(a). 偵測空氣懸浮粒子感測器

組裝零件一覽(2/6)

().Realtek阿米巴開發版

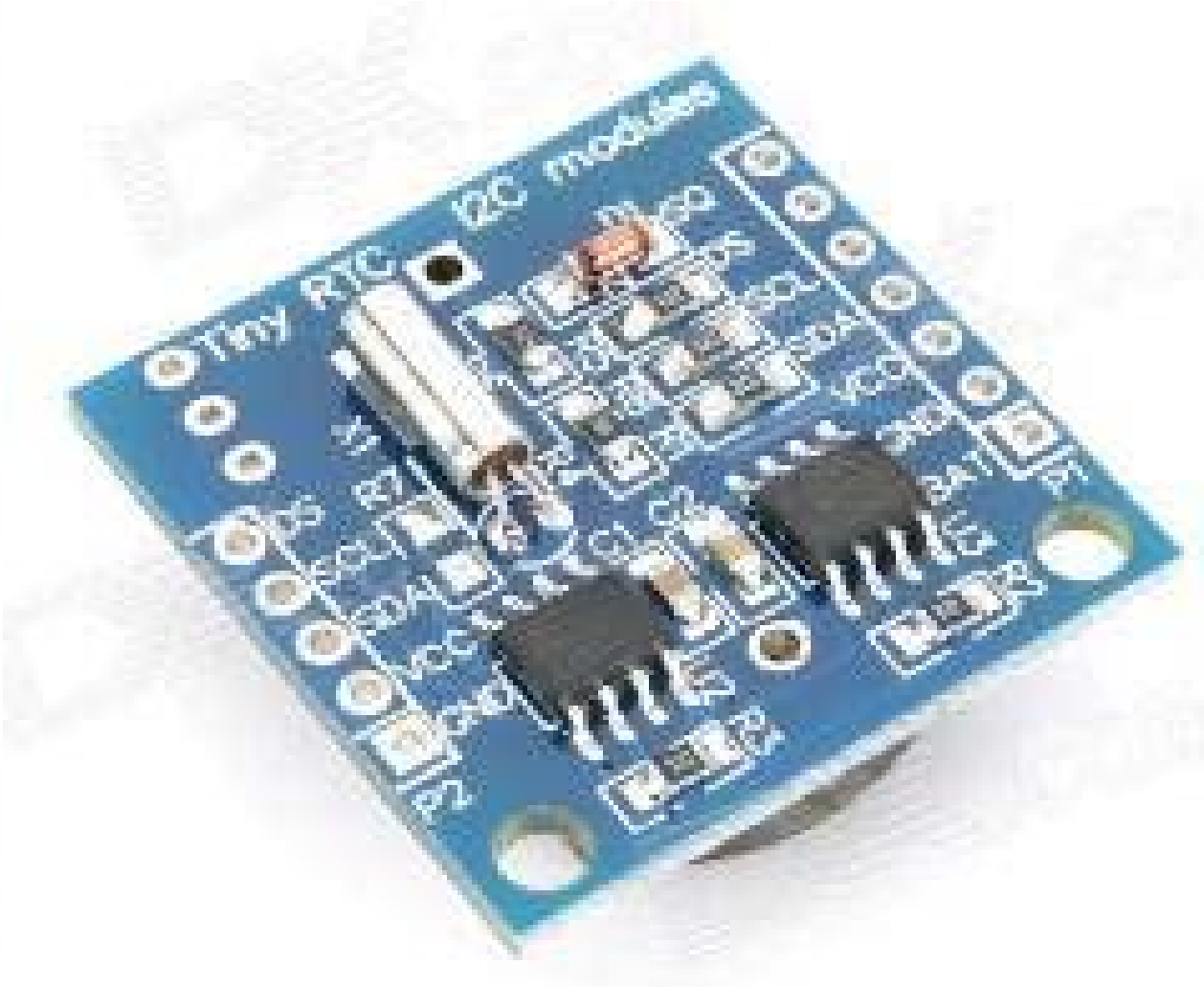


組裝零件一覽(3/6)

(c). 顯示模組

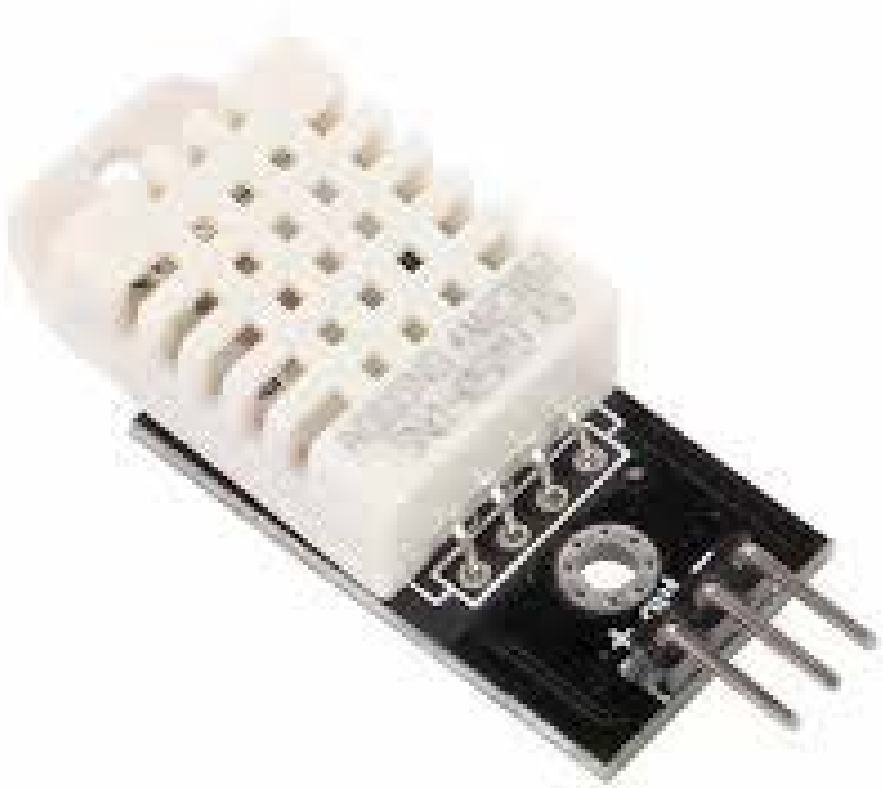
組裝零件一覽(4/6)

(d). DS1307 I2C RTC組



組裝零件一覽(5/6)

(e). DHT22



使用地圖模式查看裝置

http://g0vairmap.3203.info/map.html

使用地圖模式查看裝置

可用滑鼠滾輪上下調整地圖大小

使用地圖模式查看裝置

可用按下滑鼠左鍵平移地圖位置

使用地圖模式查看裝置

選到您的裝置盒子的GPS位置

使用GPS查看裝置

點選您的裝置

查看裝置資料


(100) Facebook
零時空汙觀測網
HiNet 網頁郵件服務
g0vairmap.3203.info/map.html
g0v 零時空汙觀測網
自造站點持續招募中!
FT1_07551
LASS
空氣溫度
25.0 °C
相對濕度
65 %
PM2.5
22 μg/m3
細懸浮微粒PM2.5
μg/m3
Date
原始資料
2小時前更新
歷史資料
條件篩選
關閉即時更新
圖層
PM2.5 (環保署分級)
<11 23 35 41 47 53 58 64 70 >71 (μg/m3)
即時濃度值對照顏色分級說明
Airbox站點已更新(2/132)
ProbeCube站點已更新(3/21)
Airbox站點已更新(2/132)
ProbeCube站點已更新(2/21)
Indie站點已更新(2/5)
Airbox站點已更新(2/132)
地圖資料©2016 Google
本零時空汙觀測網僅彙整公開資料提供視覺化參考，並不對資料數據提供保證，實際測值以各資料來源為準。
本網站由g0v零時空汙觀測專案專案小組開發維護，專案詳情請見hackholdr，原始碼公開於Github-immortalmice。

檢核網路資料-點選裝置


(100) Facebook
零時空汙觀測網
HiNet 網頁郵件服務
g0vairmap.3203.info/map.html
g0v 零時空汙觀測網
自造站點持續招募中!
FT1_07551
LASS
25.0 °C
相對濕度
65 %
PM2.5
22 μg/m3
細懸浮微粒PM2.5
μg/m3
Date
條件篩選
關閉即時更新
圖層
PM2.5 (環保署分級)
<11 23 35 41 47 53 58 64 70 >71 (μg/m³)
即時濃度值對照顏色分級說明
Airbox站點已更新(2/132)
ProbeCube站點已更新(3/21)
Airbox站點已更新(2/132)
ProbeCube站點已更新(2/21)
Indie站點已更新(2/5)
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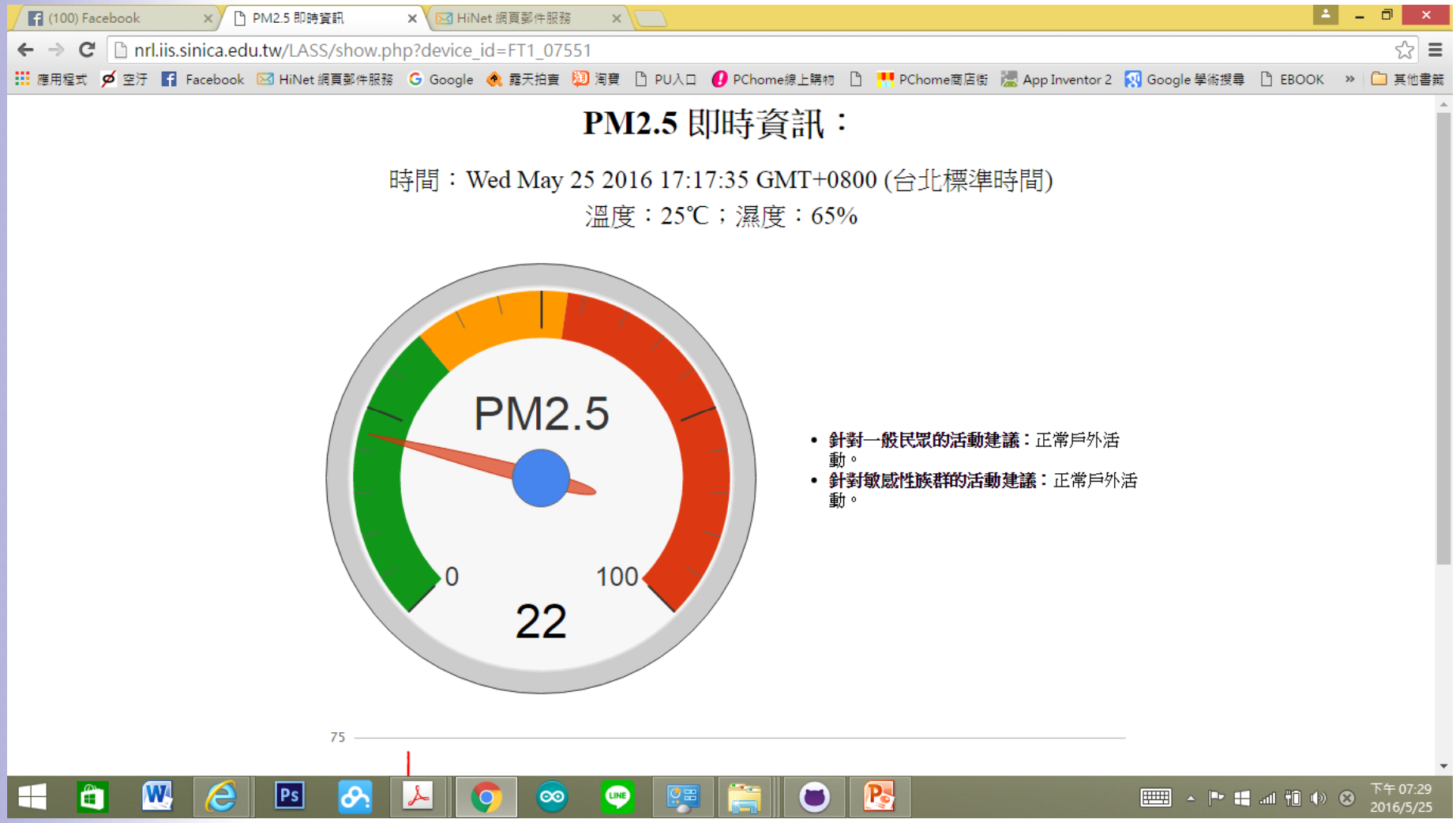
本零時空汙觀測網僅彙整公開資料提供視覺化參考，並不對資料數據提供保證，實際測值以各資料來源為準。
本網站由g0v零時空汙觀測專案專案小組開發維護，專案詳情請見hackholdr，原始碼公開於Github-immortalmice。

檢核網路資料-視覺化資料



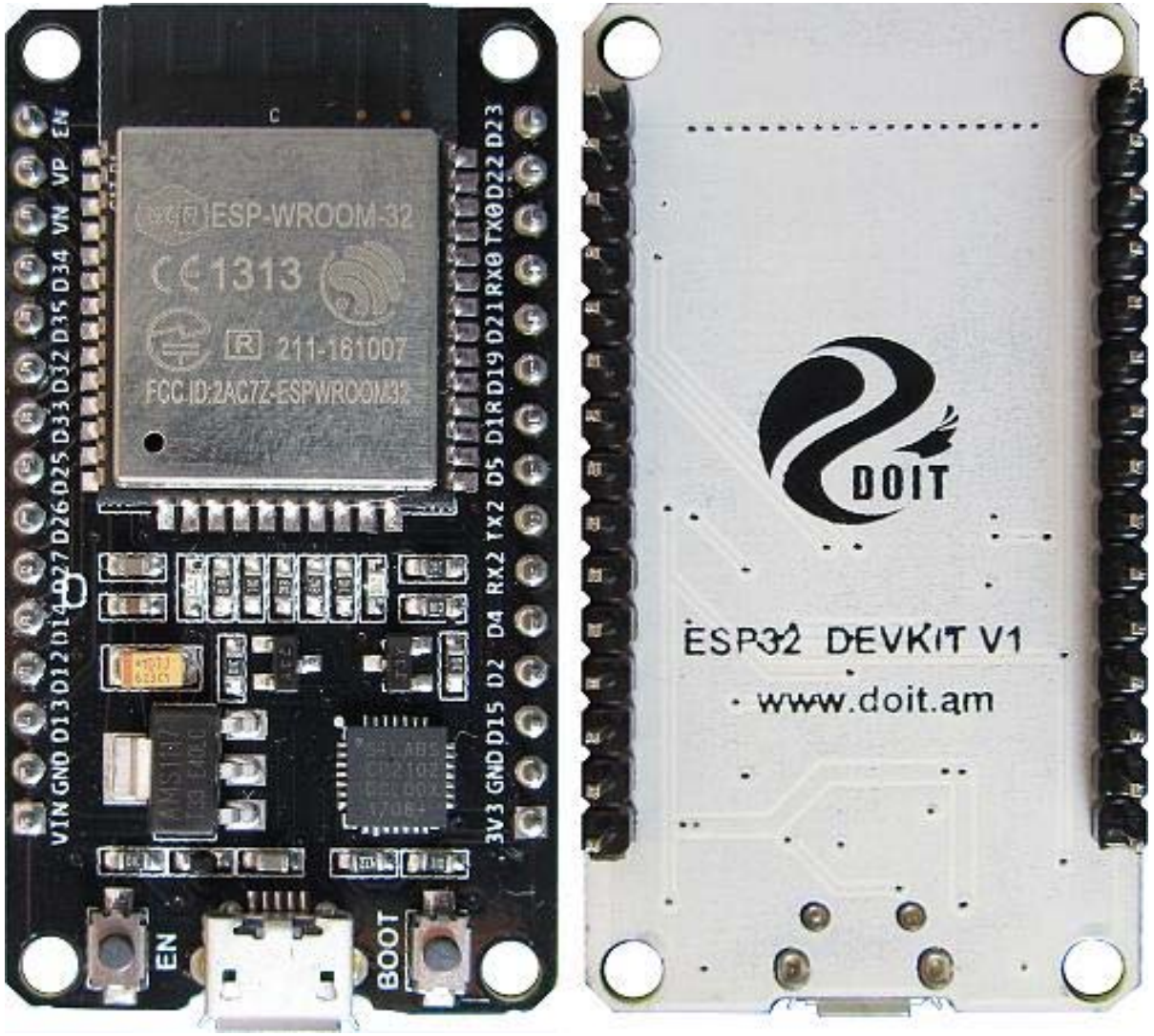
檢核網路資料-查看歷史資料

檢核網路資料：歷史資料


(100) Facebook
PM2.5 即時資訊
HiNet 網頁郵件服務
nrl.iis.sinica.edu.tw/LASS/show.php?device_id=FT1_07551
PM2.5
0
100
22
針對一般民眾的活動建議：正常戶外活動。
針對敏感性族群的活動建議：正常戶外活動。
75
50
25
0
PM2.5
20. May
21. May
22. May
23. May
24. May
25. May
Date
註：以上量測結果仍屬實驗階段，其正確性與代表性僅供參考，正確資料仍以環保署公佈為主。
Powered by LASS & IIS-NRL
下午 07:31
2016/5/25

ＥＳＰ３２智慧燈泡

ESP 32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211-161007
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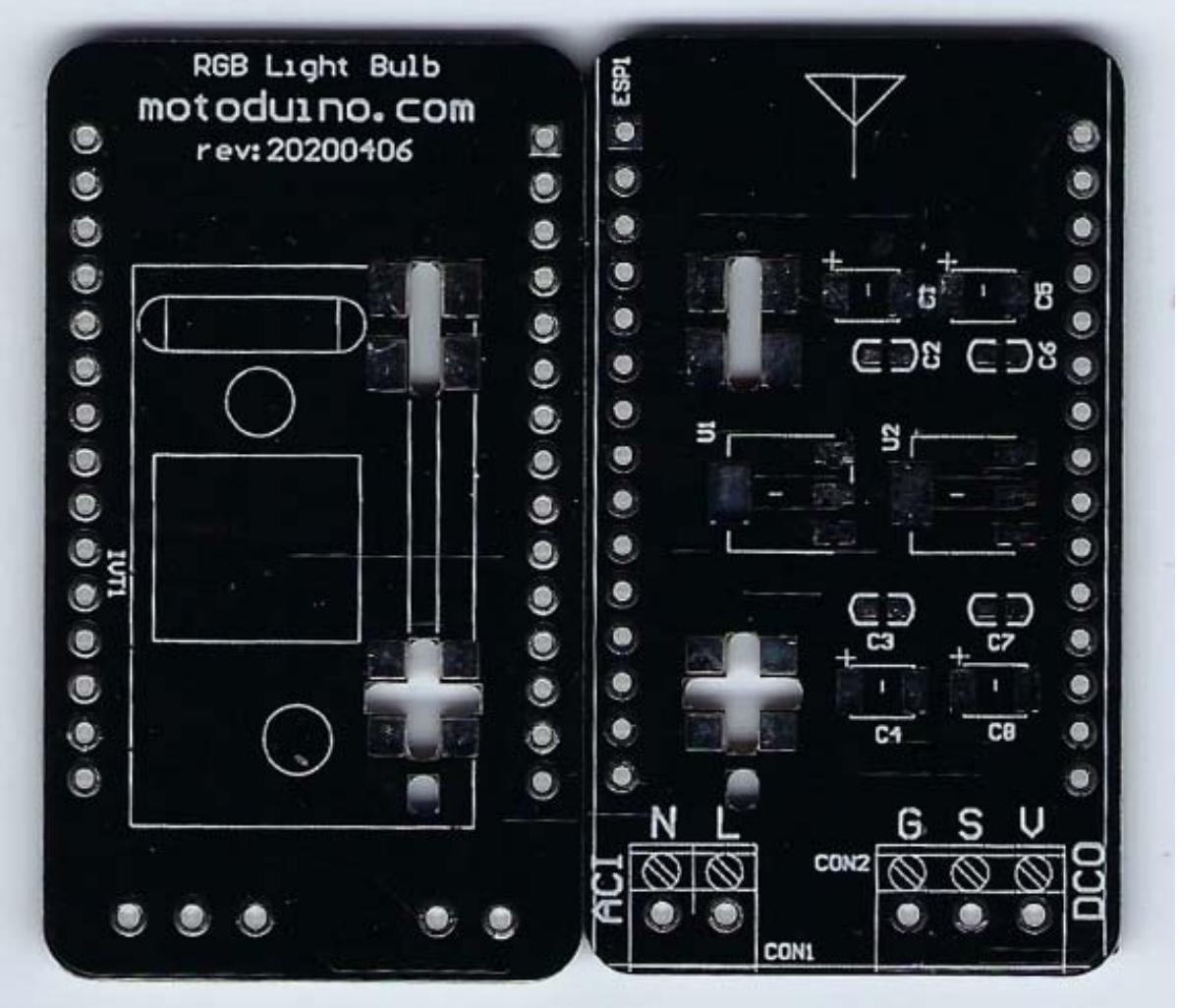
3V3 GND D15 D2 D4 RX2 TX2 D5 D18 D19 D21 RX0 TX0 D22 D23
EN
BOOT
DOIT
ESP32 DEVKIT V1
www.doit.am

Mini USB 線

WS2812B

燈泡底板


RGB Light Bulb
motoduino.com
rev:20200406
ESP1
C6
C2
C5
U1
U2
C3
C7
C4
C8
N L
AC1
CON1
G S V
CON2
DC0

Power(AC ~ 5V)

燈殼上方與燈蓋

燈底與電源頭

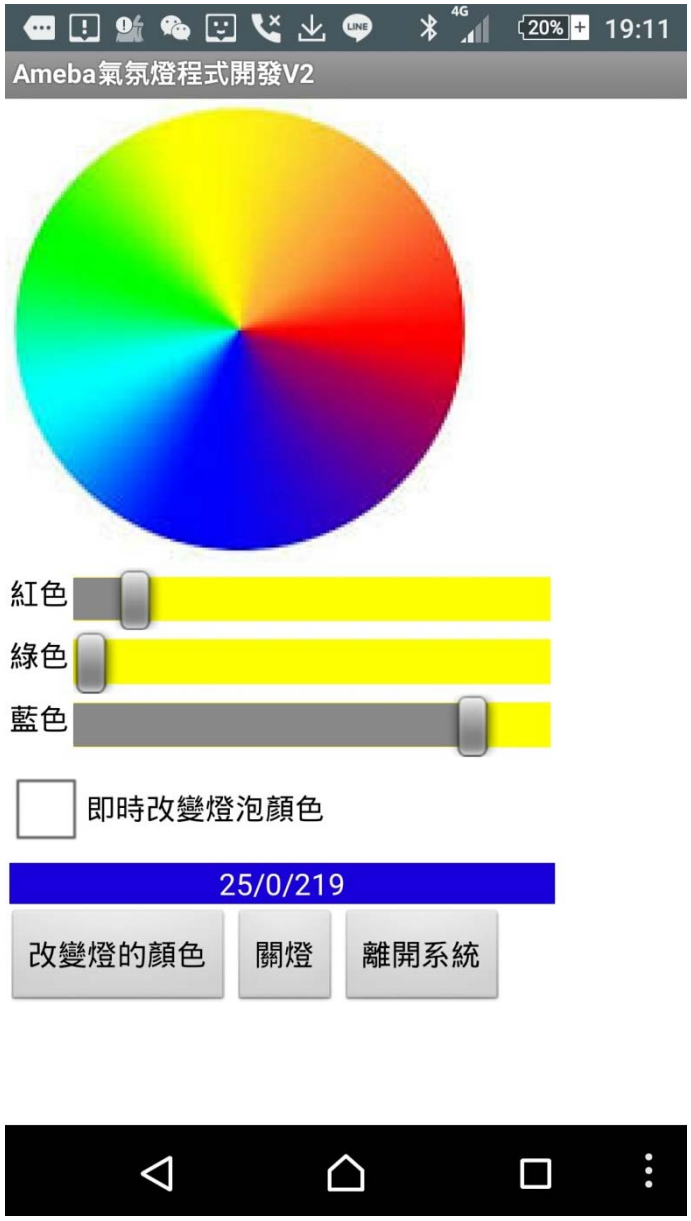
實測畫面一

實測畫面二


SONY
20:13
Ameba氣氛燈程式開發V2
紅色
綠色
藍色
即時改變燈泡顏色
0:255:5
改變燈的顏色
關燈
離開系統
@000255005#

行動裝置操控

軟體主畫面一

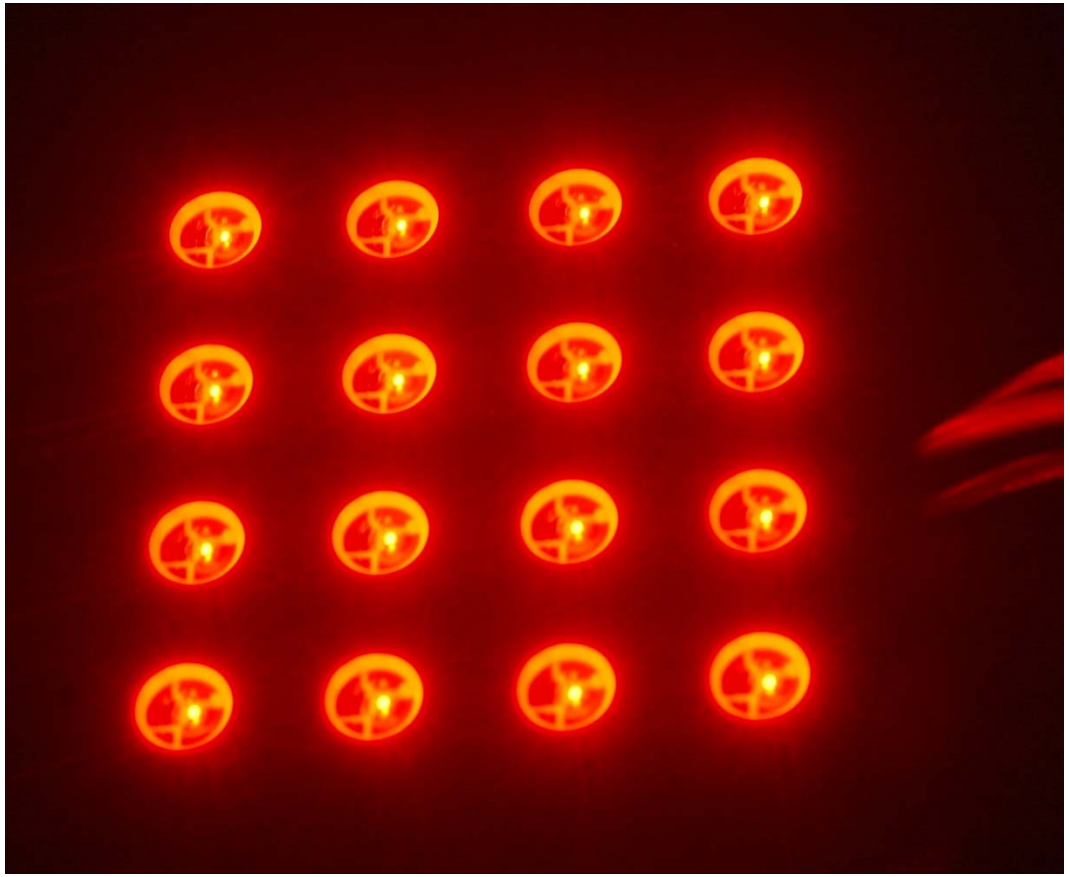

19:11
Ameba氣氛燈程式開發V2
紅色
綠色
藍色
即時改變燈泡顏色
25/0/219
改變燈的顏色
關燈
離開系統

軟體主畫面二


90% 10:21
Ameba氣氛燈程式開發V2
紅色
綠色
藍色
即時改變燈泡顏色
252/53/20
改變燈的顏色
關燈
離開系統
@252053020#

進行測試一

@255000000#



進行測試二

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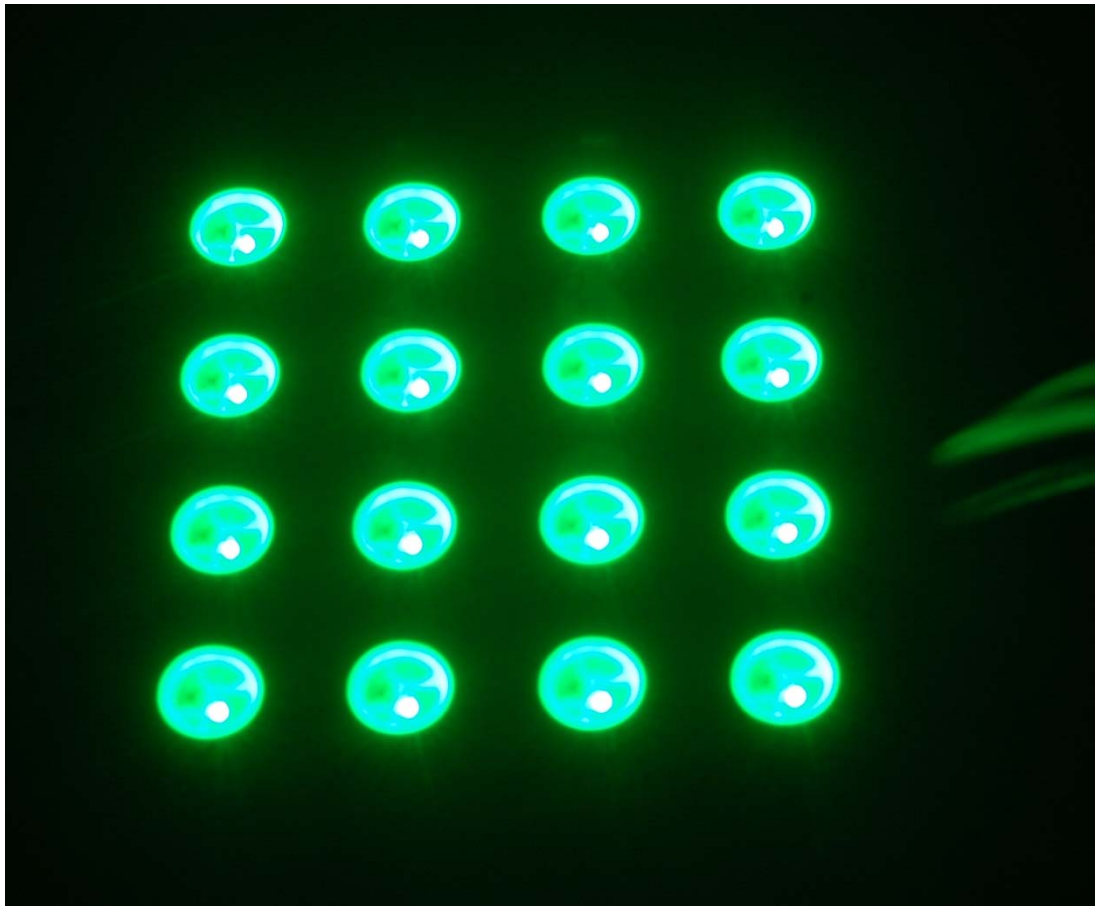

進行測試三

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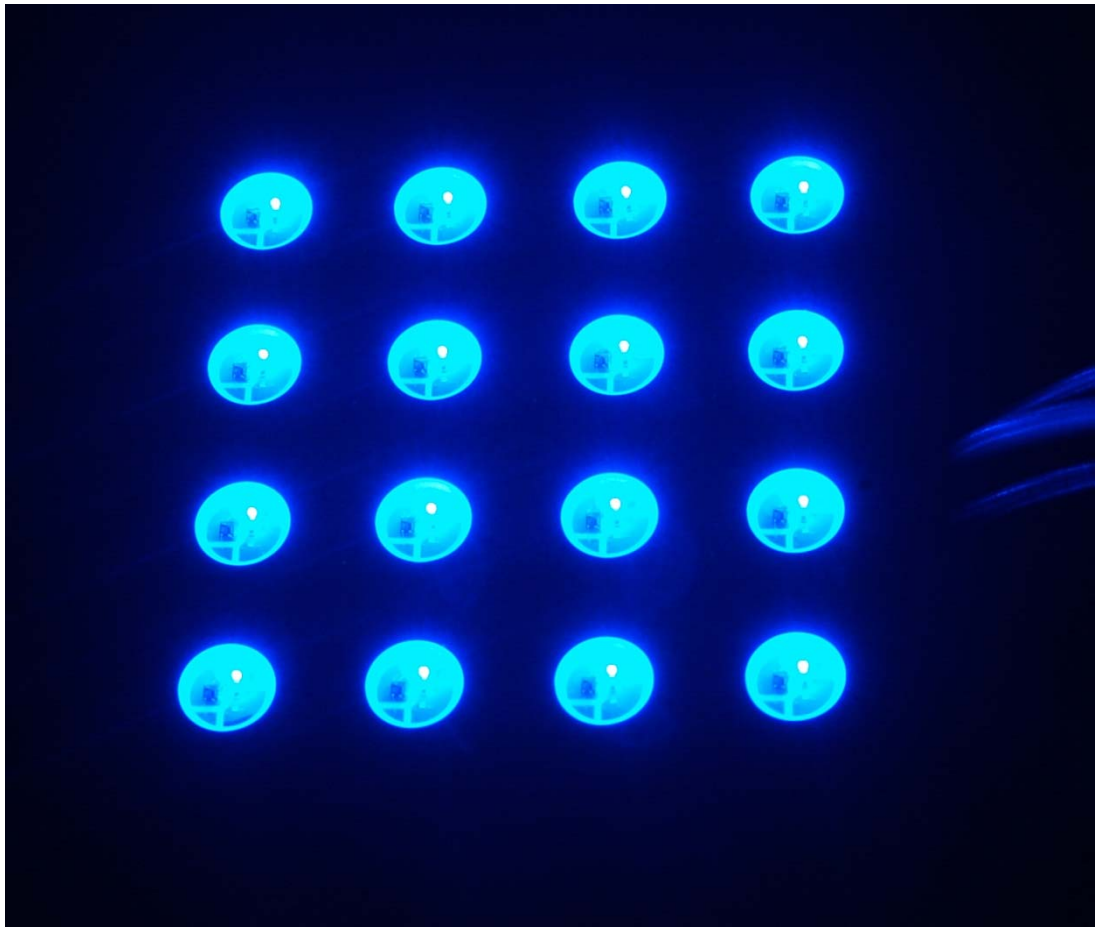

進行測試四

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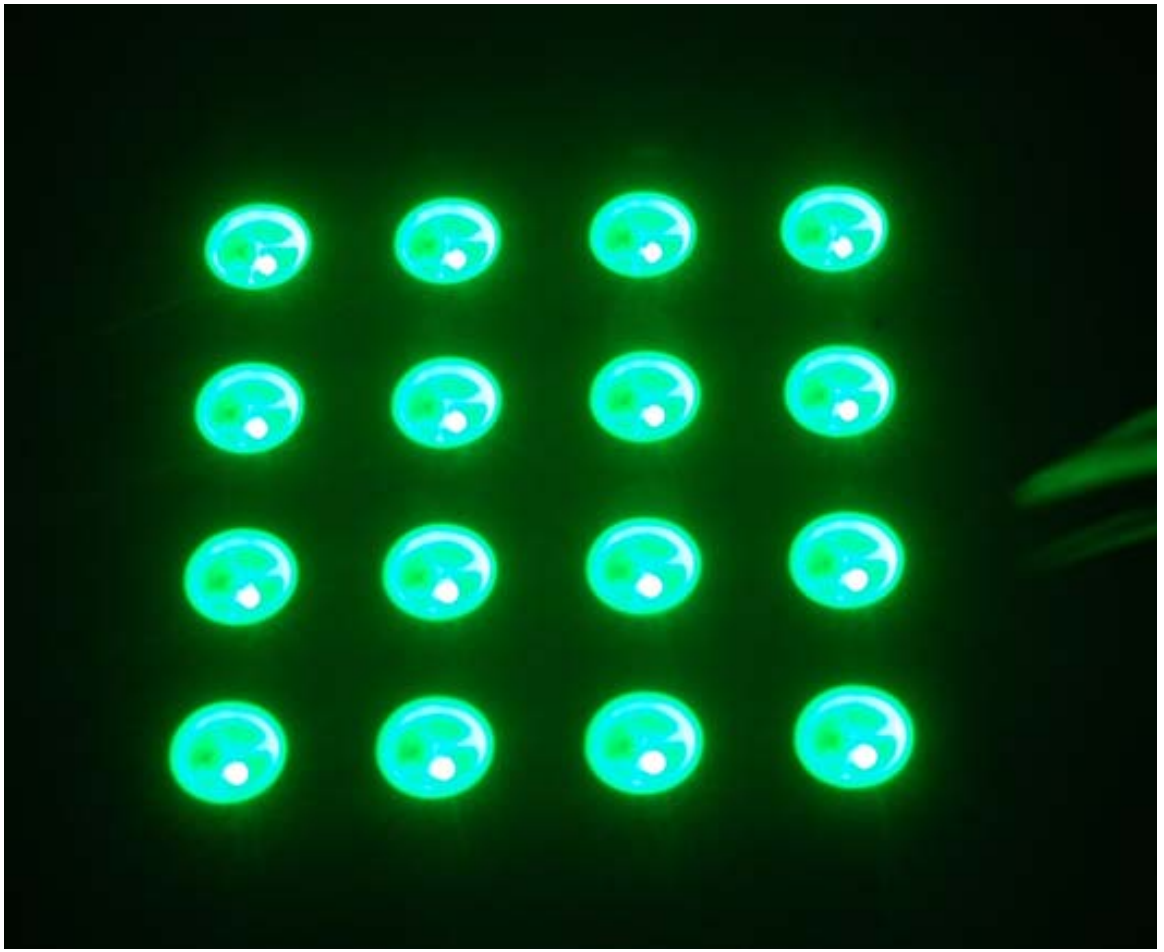


燈泡畫面

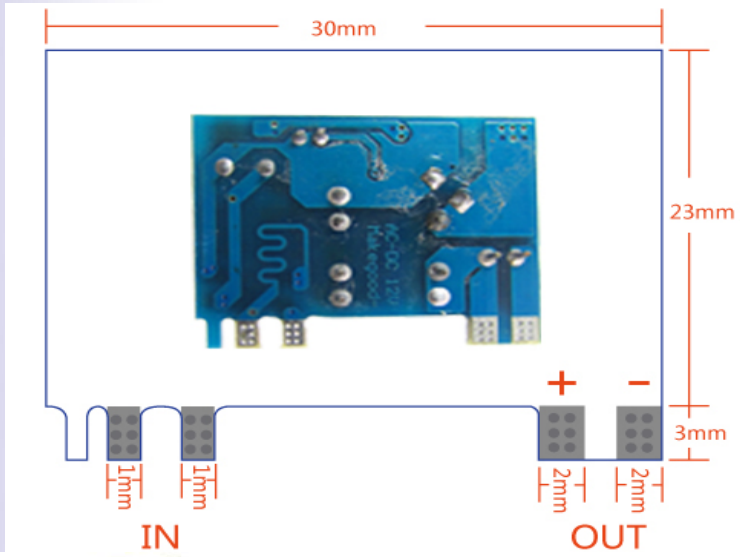
燈泡畫面

燈泡畫面

燈泡畫面

日光燈源開發

系統架構(續)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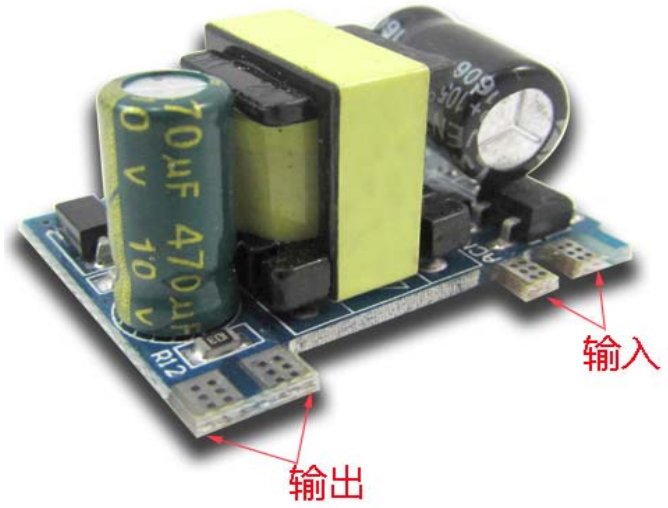
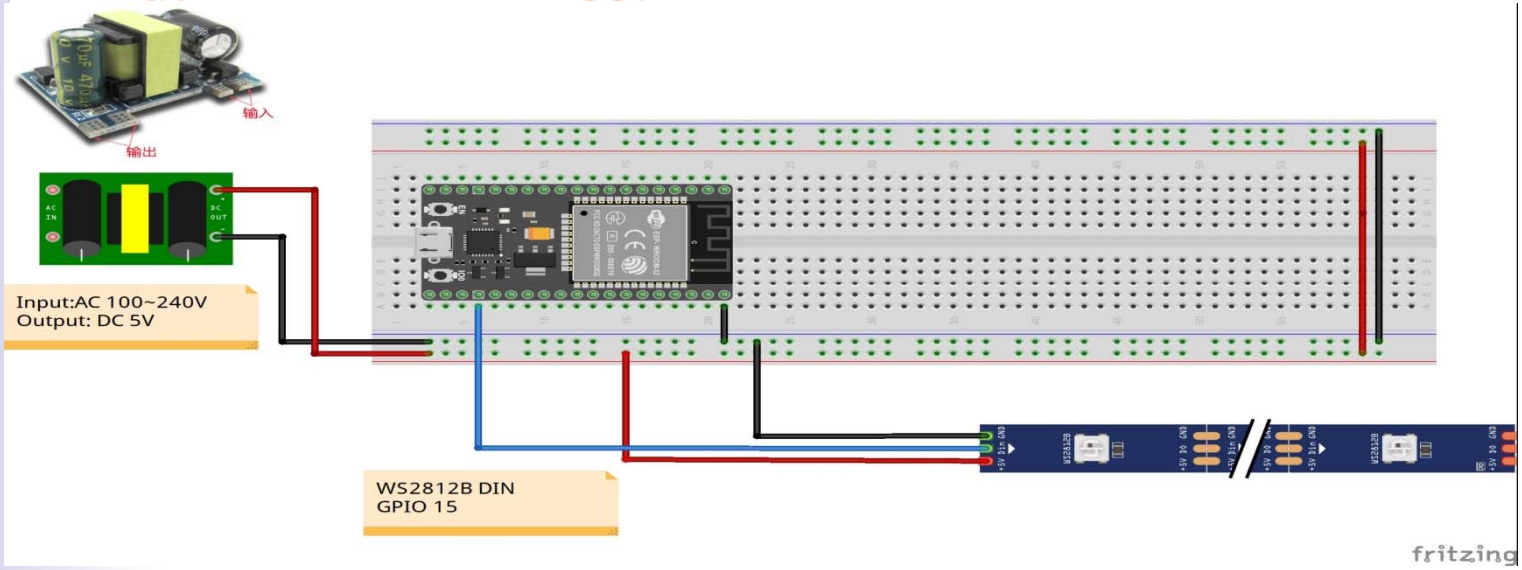
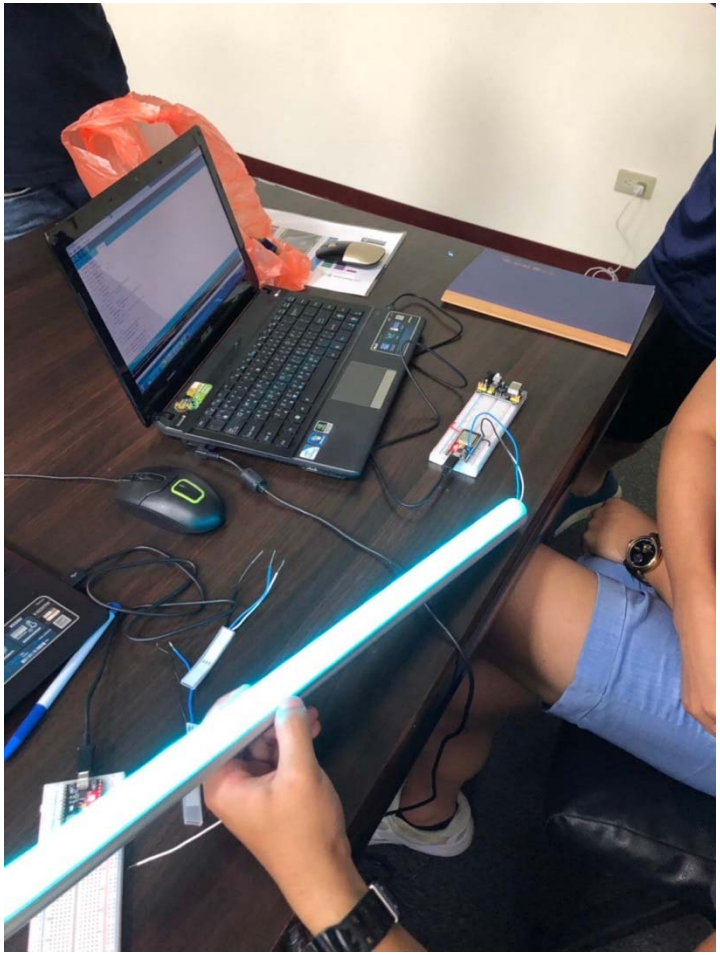
23mm
3mm
1mm
1mm
2mm
2mm
+
−
IN
OUT


輸入
輸出

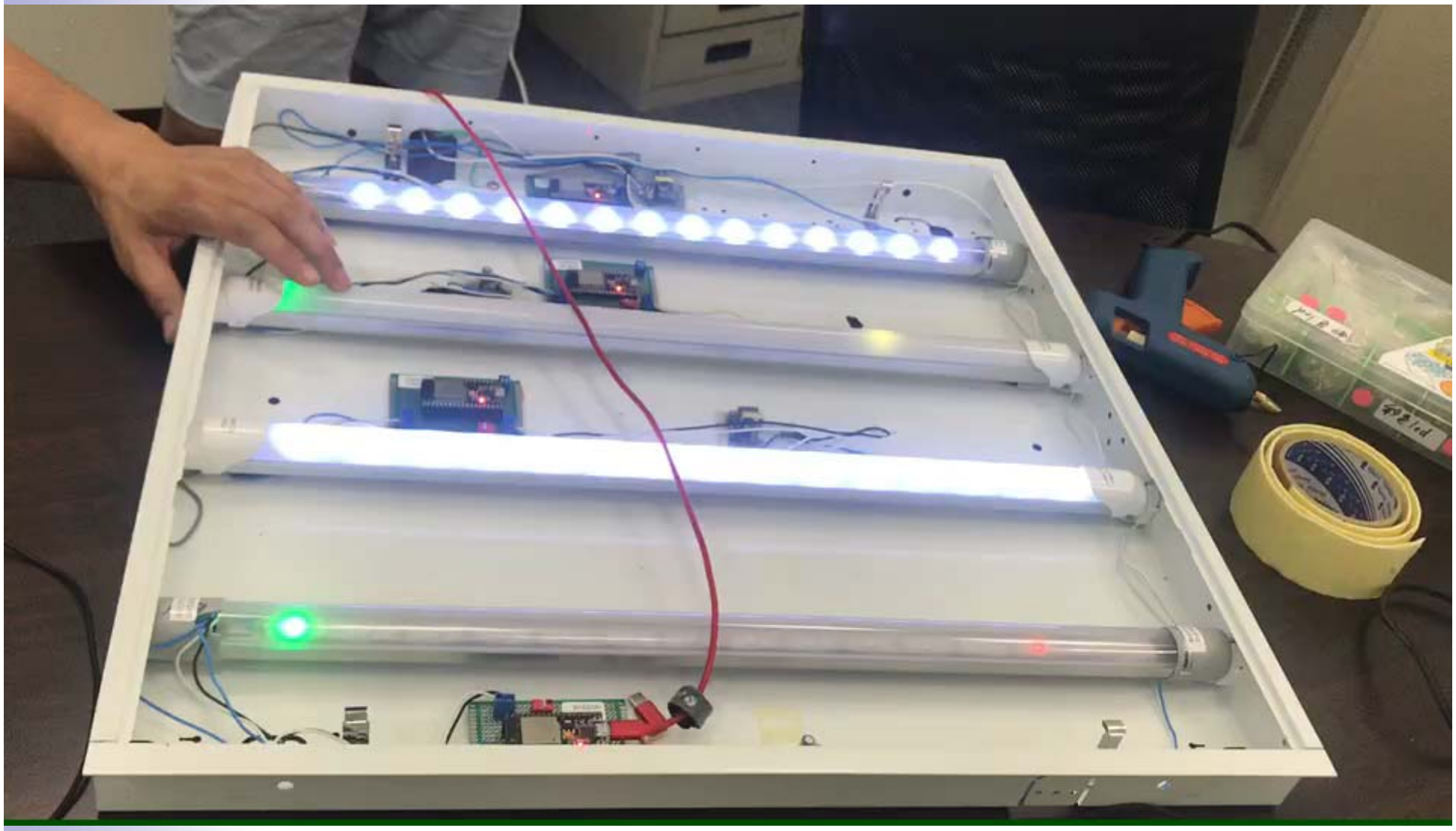

輸入
輸出
Input:AC 100~240V
Output: DC 5V
WS2812B DIN
GPIO 15
fritzing

研究過程

研究過程

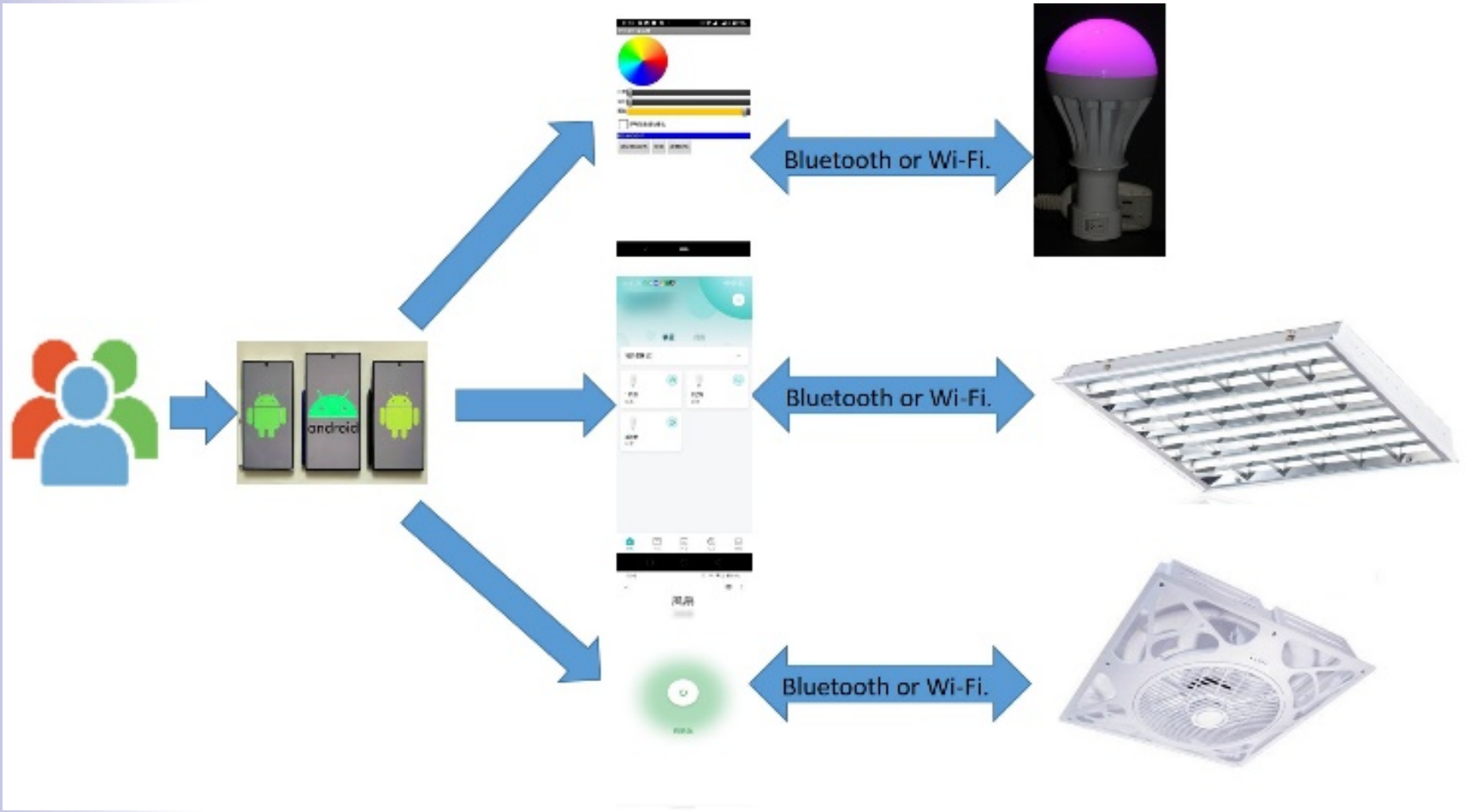


討論



虛擬開關

Background



Motivation

- Although voice input like Amazon Alexa, Google Home , Apple Siri, etc. can integrate many electronic devices into their home series to be waited to be controlled, but those applications are not open-system for the study targets, so commercial revenue may block a win-win situation at all

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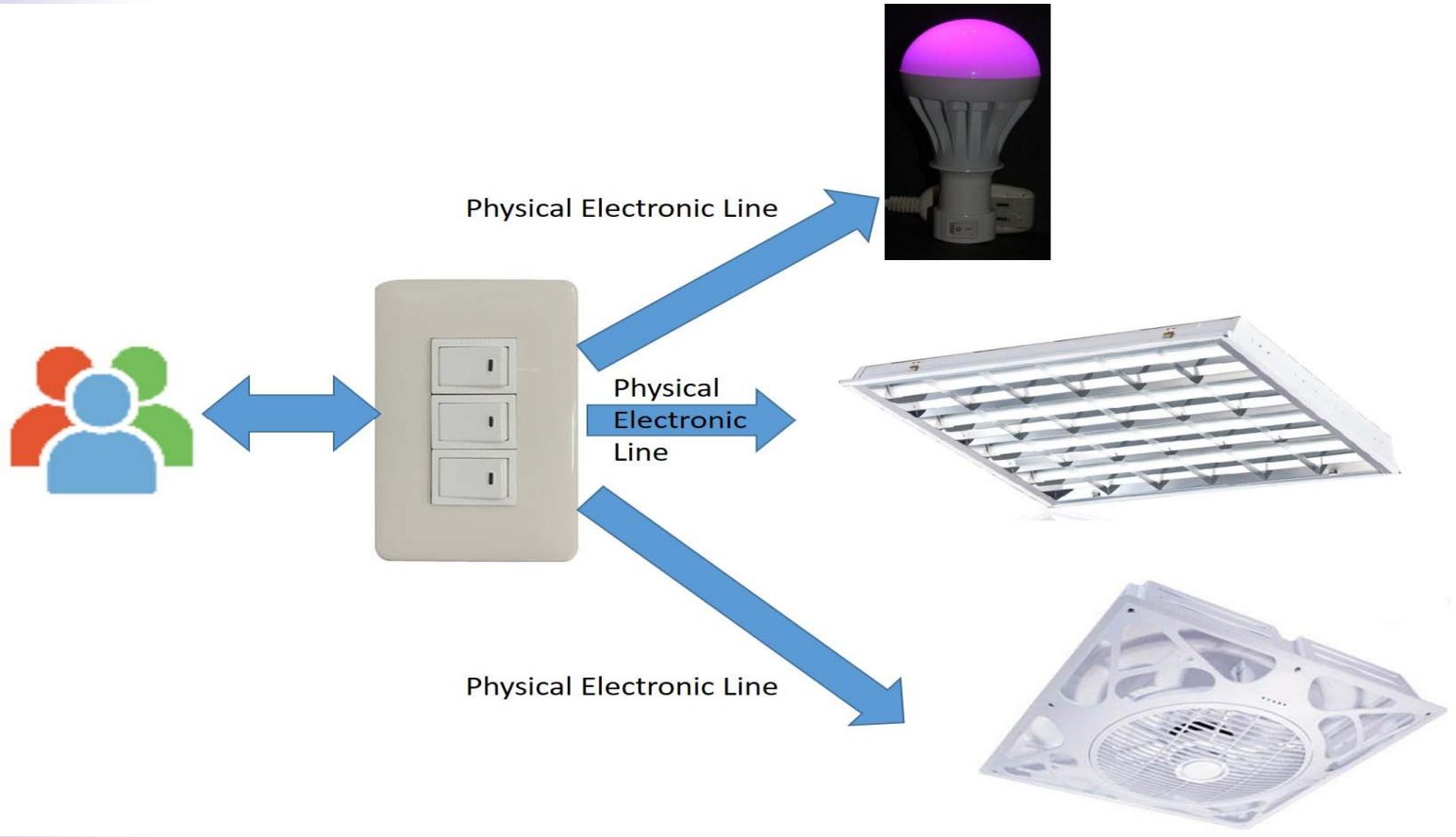
- Although voice input like Amazon Alexa, Google Home , Apple Siri, etc. can integrate many electronic devices into their home series to be waited to be controlled, but those applications are not open-system for the study targets, so commercial revenue may block a win-win situation at all

Motivation

- The most critical problems which is the fully replacement of those power switches in families, become impossible mission in spite of high-expense and influence by migration and up-gradation of traditional power-line cabling deployments. If the study can develop some mechanisms which can communicate with those power switches and electronic products to co-work together to up-grade the traditional electronic products painless fully, the home appliance of smart and intelligent home will take over the traditional ones without any revolutionary life-style change.

Motivation


Physical Electronic Line
Physical
Electronic
Line
Physical Electronic Line

Constraint

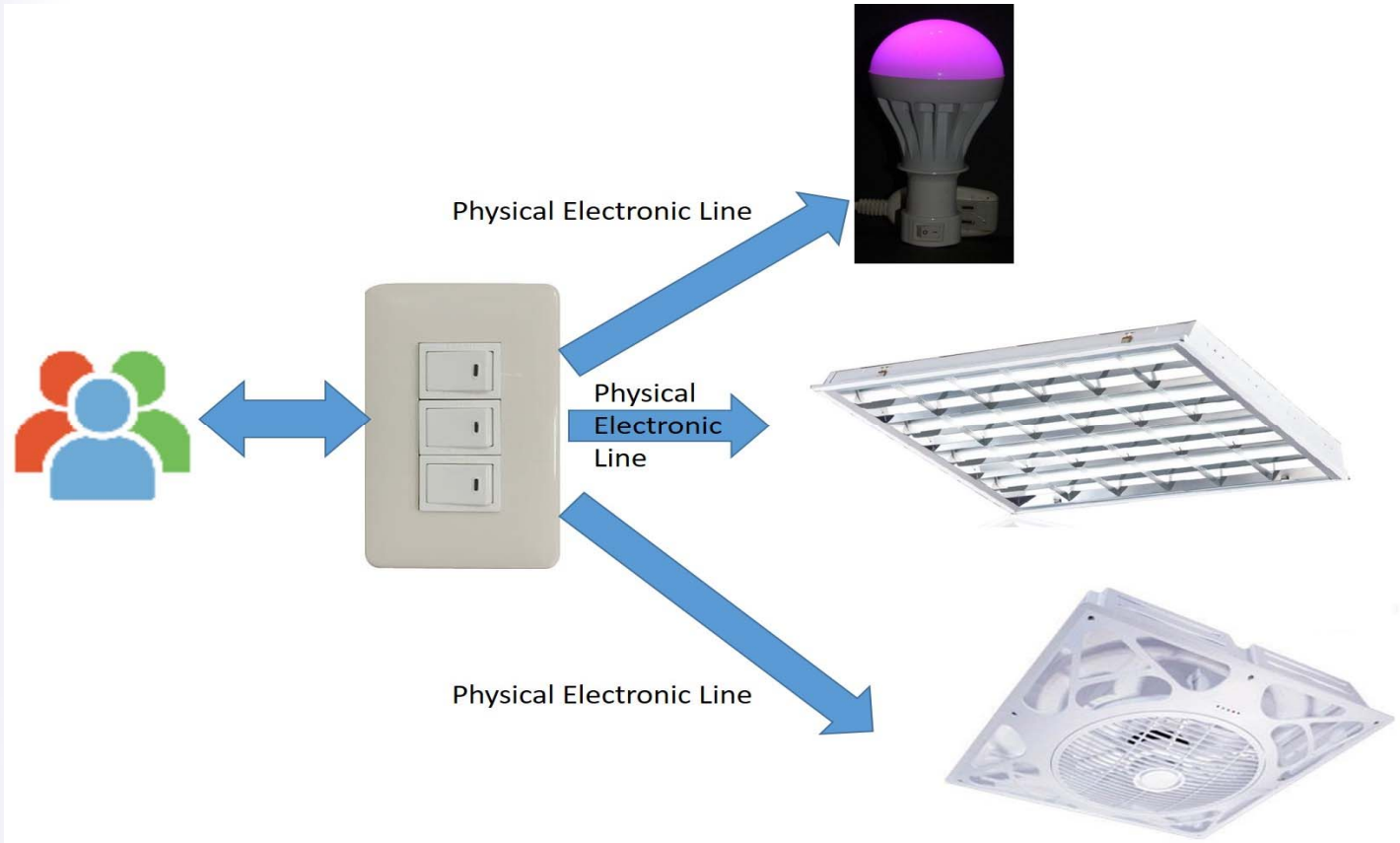
- The electronic led bulbs and tubes are main research targets in this study.
- The on-line web system and physical controlling panel are the implementation in this study.
- The development of device is based on NodeMCU-32 Lua WiFi

Literature Survey

The traditional power line cabling deployment

- The power line cabling of the building and rooms are still a fixed fitment and any changes will spend much expense and time-consuming. Because those power-cabling-line for light-sockets，power-sockets, power-switches usually were buried in the wall and ceiling due to the beautiful consideratio

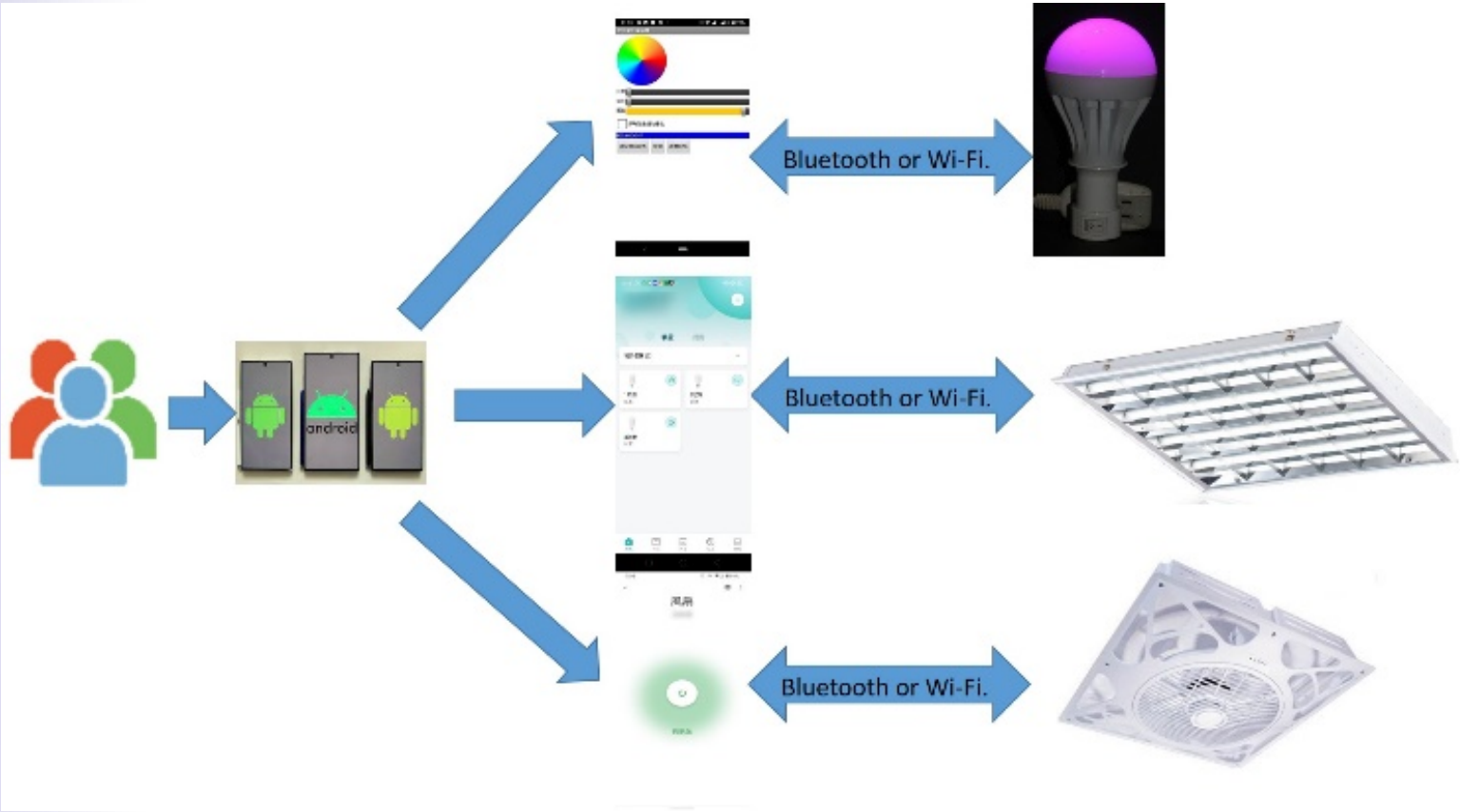
The traditional power line cabling deployment



Mobile Device Control the Electronic Devices

- Mobile Device Control the Electronic Devices
- Most of those device were designed to be one-to-one & bi-direction communication one time and the mobile devices are not so many as traditional power-switches on the walls

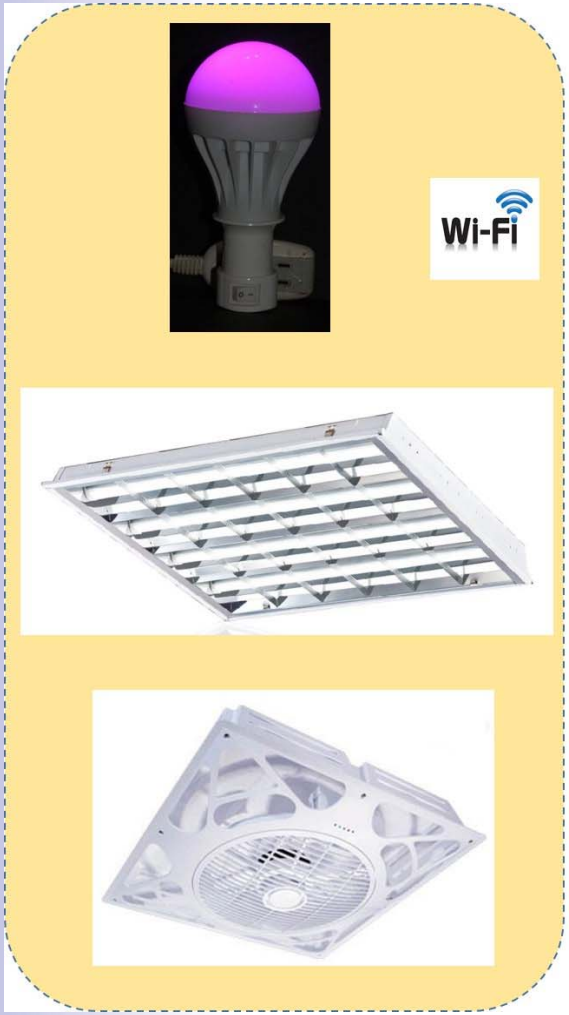
Mobile Device Control the Electronic Devices



IOT based System Architecture

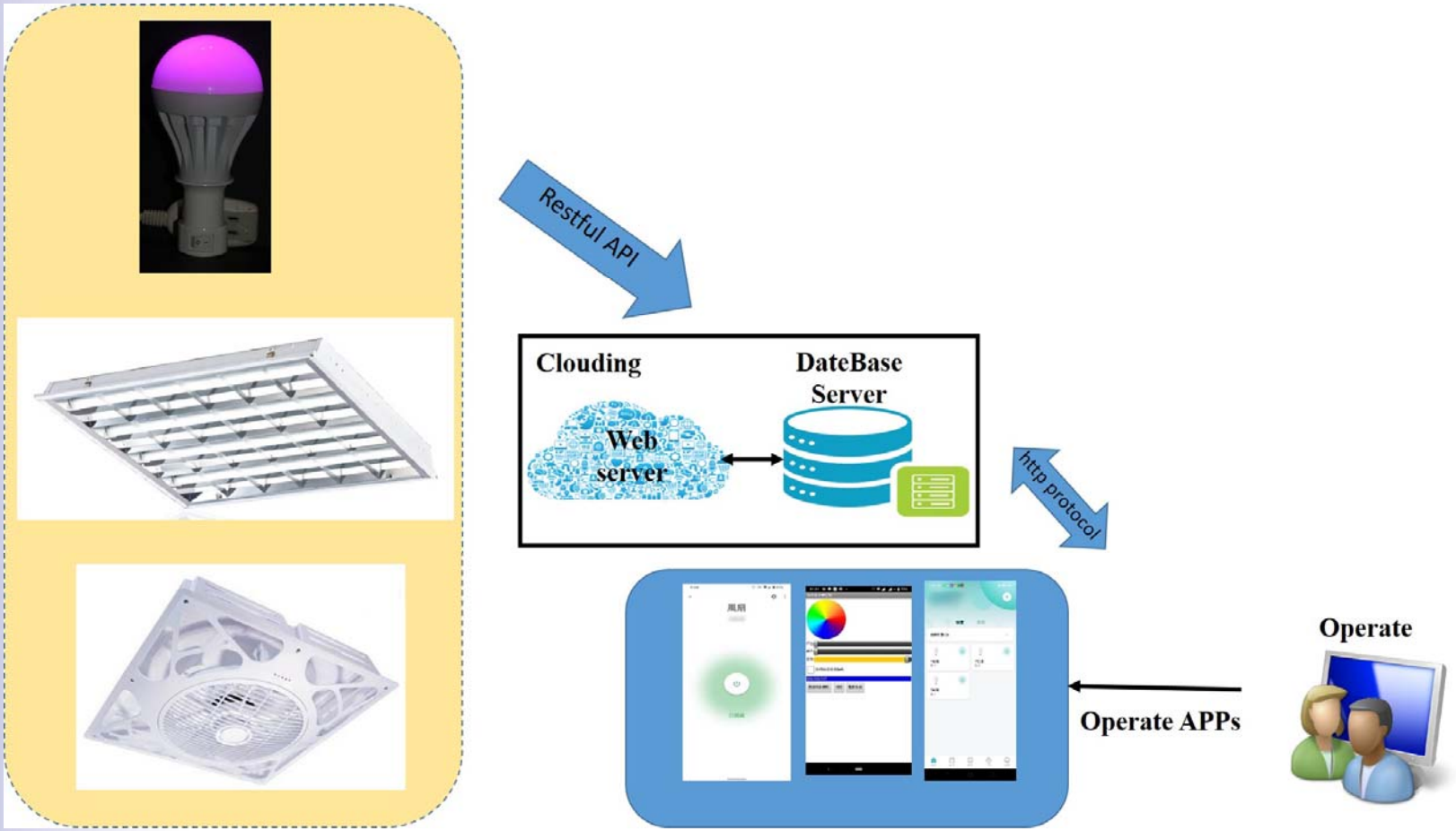
- For achieving the instant and bi-direction communication between controllers and be-controlled devices, the study adds MQTT broker into the proposed IOT-based architecture
- the functions of MQTT broker extracts the all information into pure and public information hub on Internet and receiving all information for any devices or information only need to subscribe the topic, which the any controllers publish their controlling commands as publishing information to, to get instant controlling commands as subscribing information to do their jobs indecently

IOT based System Architecture

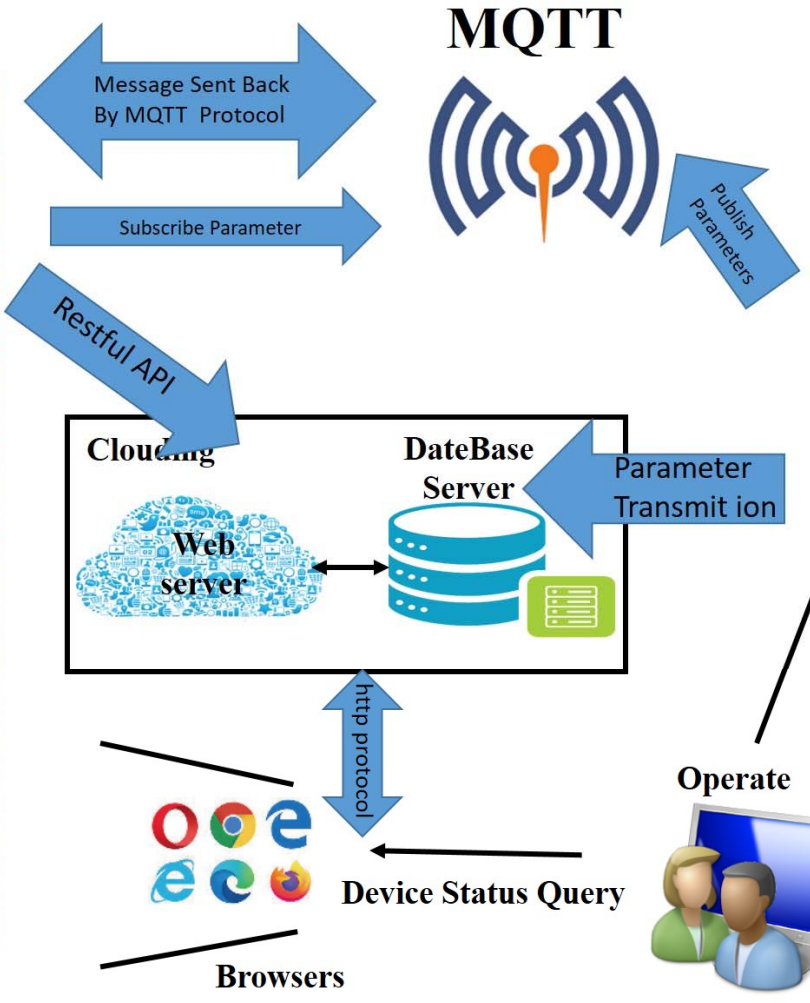


System Design

Original System Architecture



IOT-based System Architecture



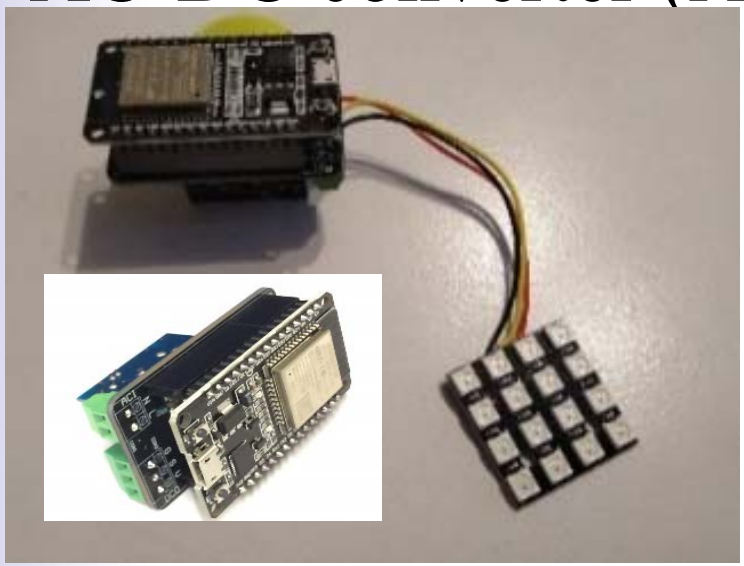
Comparison

	Advantages	Disadvantages
Original System Architecture	Users can use any internet-based equipment via Internet to access web-site and query sensor data with browsers in passive way	Those information still can't be delivered to users who hope to get such information with initiative and automatic way.
IOT-based System Architecture	Under the above-mentioned architecture, all information transmission become very transparent and quick-response to other independent devices without any PC or browsers supporting.	◆ Requires more processing power and more memory. ◆ Limits the scalability as each client devices. ◆ Centralized broker limits the scalability as each client devices

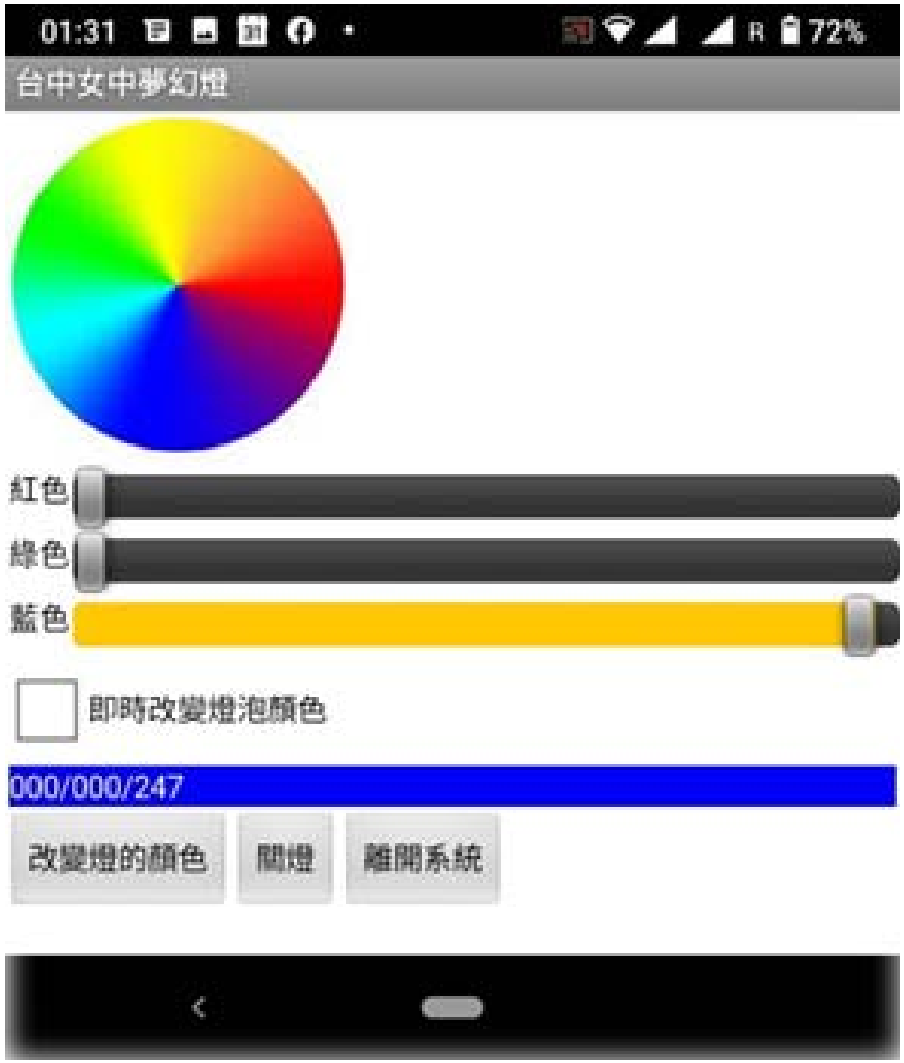
Implementation System

Eltronic Light Buld Design

- implementations a circuit and layouts a PCB for the proposed device as shown in Fig 6.(a) & (b). This PCB uses NodeMCU-32 as CPU to control Led modules(WS2812B) bind to AC-DC converter (AC100-240V to DC 5V)



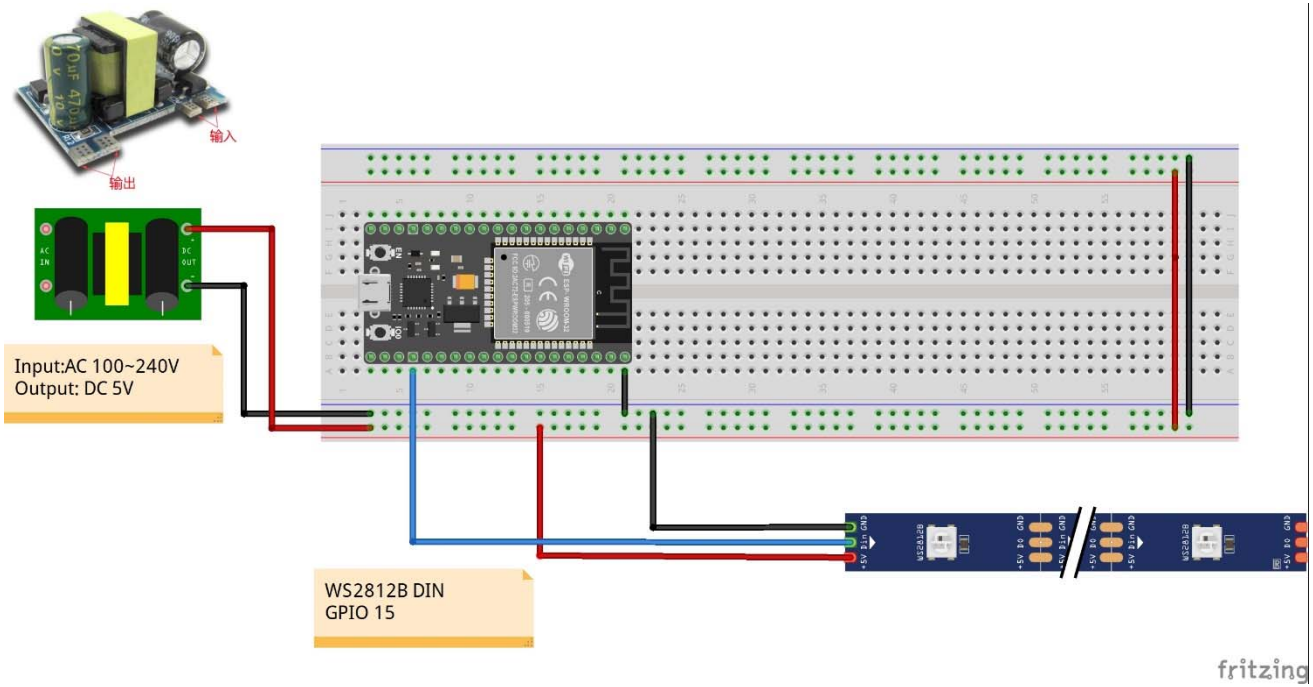
Eltronic Light Buld Design



Eltronic Light Buld Design

Eltronic Light Tube Design

- Electronic led light tube is the ceiling light equipment based on the circuit. The study uses AC 100-240V to DC 5V convert to be AC power input without any extra power-convert indeed



Eltronic Light Buld Design

Communication Protocol


```
{
        "Device":"246F289DB0C4",
        "NO":1,
        "Command":"ON",
        "Mode":"BW" ,
        "Color":"FF0000"
}
```

Clouding Platform Design

- The clouding platform located in URL: http://ncnu.arduino.org.tw:9999/led.php
- ll registered electronic devices on the homepage, users can identify, whom virtual-switches belong to, to click linked-text: LedON/LedOFF to turn on/off the physical electronic led light

Clouding Platform Design

國立暨南國際大學
National Chi Nan University

智慧燈具管理系統
An Intelliogent Led Tube & Bulb Information Management

Home | System | Led Device | Misc

Switch Name(開關名稱)	User Name(使用者名稱)	Led Name(燈泡名稱)	MAC Address(燈泡卡號)	Status(狀態)	Management/Curve Chart
圖書館二樓電腦教室	楊志忠	黃淑珠	10521C67EF3C	1	Led ON / Led OFF
圖書館二樓電腦教室	楊志忠	楊博的燈	AC67B22B09AC	1	Led ON / Led OFF
浴室燈	王仁杰	王仁杰的燈泡	246F289E4184	1	Led ON / Led OFF
客廳燈	李奇陽	李奇陽的燈泡	CC50E38CD9A4	1	Led ON / Led OFF
書桌燈	葛志聖	葛志聖的燈泡	A4CF125D3378	1	Led ON / Led OFF
夢夢的燈	曹永忠	曹老師的燈泡	A4CF125D10B4	1	Led ON / Led OFF
奶咪小燈	曹永忠	my BedRoom Ceiling Light(臥室頂燈)	240AC405A228	1	Led ON / Led OFF
奶咪小燈	曹永忠	aaaaaaaaa	246F289DB0C4	1	Led ON / Led OFF

Student：王仁杰 REN,JIE. WANG
葛志聖 KO,CHIHSHENG
李奇陽 LI,CHI YANG
何柳霖 HO, LIU LIN
周柏綸 CHOU,PO LUN

Advisor：曹永忠 博士 Yung-Chung Tsao Ph.D

Addresss:(54561) No.1, University Rd., Puli Township,

Clouding Platform Design

- The registered user-list from user-list menu as shown in Next Slide.
- And users can add their room for locating the power-switches here.

Clouding Platform Design

國立暨南國際大學
National Chi Nan University

智慧燈具管理系統
An Intelliogent Led Tube & Bulb Information Management

Home | System | Led Device | Misc

ID(主鍵)	User ID(使用者編號)	User Name(使用者名稱)	UpdateTime(最後更新時間)	Management(管理動作)
6	amos	楊志忠	20201028151735	Add Room(新增房間)
1	brucetsao	曹永忠	20200815120000	Add Room(新增房間)
5	daniel	何柳霖	20200815130000	Add Room(新增房間)
2	tony	葛志聖	20200815130000	Add Room(新增房間)
4	wang	王仁杰	20200815130000	Add Room(新增房間)
3	youn	李奇陽	20200815130000	Add Room(新增房間)

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李奇陽 LI,CHI YANG
何柳霖 HO, LIU LIN
周柏綸 CHOU,PO LUN

ncnu.arduino.org.tw:9999/leduser/roomadd.php?sid=1

Clouding Platform Design

- The clouding platform also offer adding new room in webpage as shown in Next Slide
- by click linked text: Add Room to add their room

Clouding Platform Design

Clouding Platform Design

- The clouding platform also offer configured room lists from room-list menu as shown in Next Slide
- User can check how many rooms were added

Clouding Platform Design

國立暨南國際大學
National Chi Nan University

智慧燈具管理系統
An Intelligent Led Tube & Bulb Information Management

Home | System | Led Device | Misc

User ID(使用者者編號)	User Name(使用者名稱)	Room Name(房間名稱)	Room Address(房間住址)	Room FPS(房間座標)	Management(管理動作)
amos	楊志忠	基隆高中圖書館	基隆市暖暖區源遠路20號	(25.107803 , 121.732841)	Add Switch(新增房間開關)
brucetsao	曹永忠	夢夢的房間	臺北市羅斯福路四段一號	(25.017771 , 121.539749)	Add Switch(新增房間開關)
daniel	何柳霖	何柳霖的房間	臺中市南區興大路145號	(24.123752 , 120.676937)	Add Switch(新增房間開關)
tony	葛志聖	葛志聖的房間	811高雄市楠梓區高雄大學路700號	(22.734410 , 120.284474)	Add Switch(新增房間開關)
wang	王仁杰	王仁杰的房間	892金門縣金寧鄉大學路1號	(24.448121 , 118.322535)	Add Switch(新增房間開關)
youn	李奇陽	李奇陽的房間	701台南市東區大學路1號	(22.999191 , 120.219601)	Add Switch(新增房間開關)

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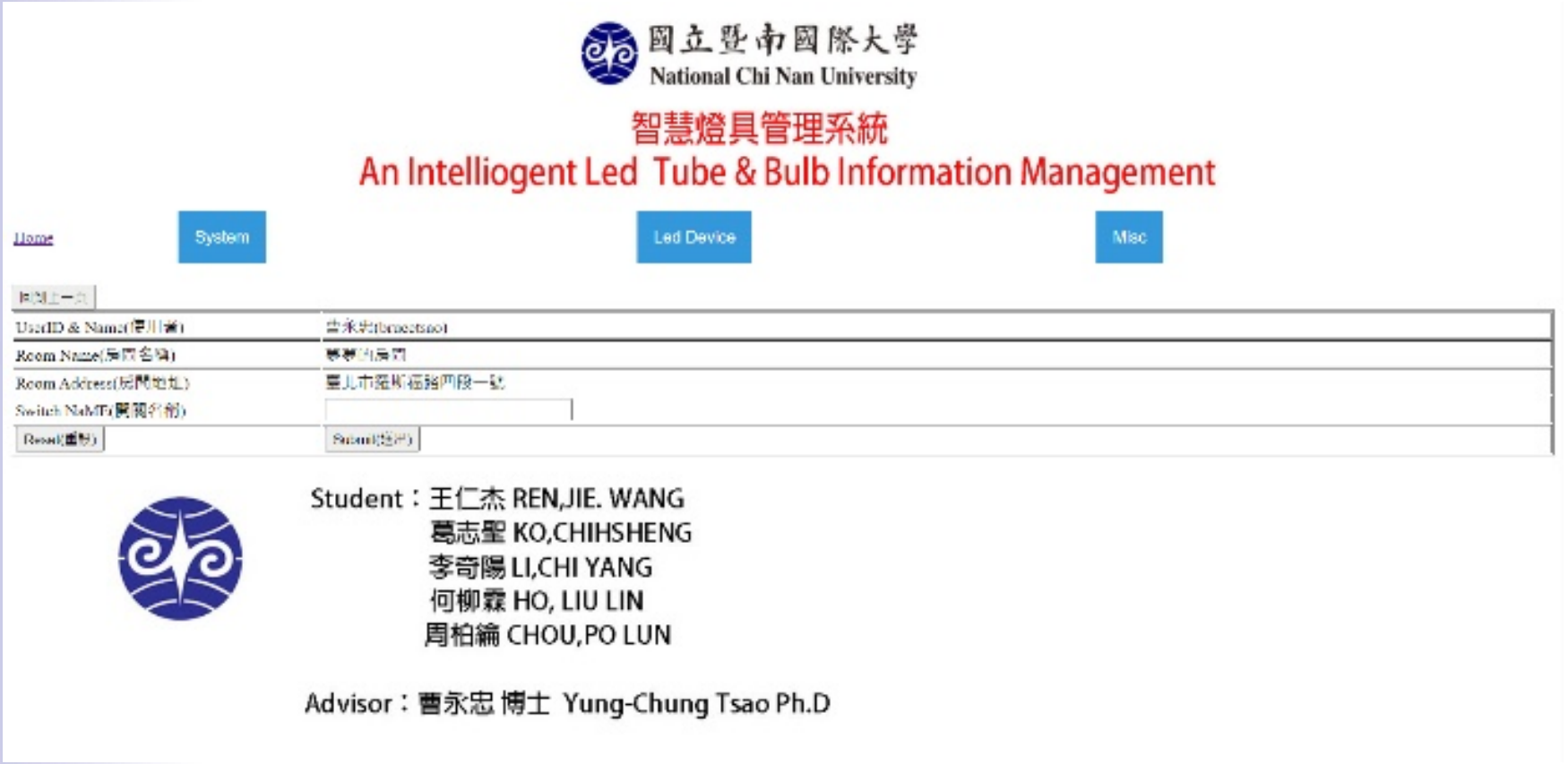
李奇陽 LI,CHI YANG
何柳霖 HO, LIU LIN
周柏綸 CHOU,PO LUN

Clouding Platform Design

- The clouding platform also offer adding new switch in webpage as shown in Next Slide
- User can click linked text: Add Switch to add new power-switches

Clouding Platform Design



Clouding Platform Design

- The clouding platform also offer configured switch lists from switch-list menu as shown in Next Slide
- User also can check how many switches were added in their room.

Clouding Platform Design

國立暨南國際大學
National Chi Nan University

智慧燈具管理系統
An Intelligent Led Tube & Bulb Information Management

Home | System | Led Device | Misc

Operation(動作)	User Name(房間主人名稱)	Room Name(房間名稱)	Switch Name(開關名稱)	Room Address(房間住址)	UpdateTime(最後更新時間)
Add Led	曹永忠	夢夢的房間	夢夢的燈	臺北市羅斯福路四段一號	20200815120000
Add Led	曹永忠	夢夢的房間	奶咪小燈	臺北市羅斯福路四段一號	20200815120000
Add Led	楊志忠	基隆高中圖書館	圖書館二樓電腦教室	基隆市暖暖區源遠路20號	20201028151735
Add Led	王仁杰	王仁杰的房間	浴室燈	892金門縣金寧鄉大學路1號	20200815130000

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李奇陽 LI,CHI YANG
何柳霖 HO, LIU LIN
周柏綸 CHOU,PO LUN

Advisor：曹永忠 博士 Yung-Chung Tsao Ph.D

Clouding Platform Design

- All electronic devices, which will register their MAC address into clouding platform's DB system, whenever those electronic devices are new or old. In other word, any one creates any electronic devices based on the proposed mechanism as shown in Next Slide

Clouding Platform Design

Clouding Platform Design

- User also can click the geographical site to open the pop menu, which mechanism as shown in Next Slide for all electronic devices,
- User also turn on/off the belonged virtual switches as shown in Next Slide .

Clouding Platform Design

討論


不安全 | ncnu.arduino.org.tw:9999/led.php
國立暨南國際大學
National Chi Nan University
智慧燈具管理系統
An Intelligent Led Tube & Bulb Information Management
Home
System
Led Device
Misc
Switch Name(開關名稱) | User Name(使用者名稱) | Led Name(燈泡名稱) | MAC Address(燈泡卡號) | Status(狀態) | Management/Curve Chart
圖書館二樓電腦教室 | 楊志忠 | 黃淑珠 | 10521C67EF3C | 1 | Led ON / Led OFF
圖書館二樓電腦教室 | 楊志忠 | 楊博的燈 | AC67B22B09AC | 1 | Led ON / Led OFF
浴室燈 | 王仁杰 | 王仁杰的燈泡 | 246F289E4184 | 1 | Led ON / Led OFF
客廳燈 | 李奇陽 | 李奇陽的燈泡 | CC50E38CD9A4 | 1 | Led ON / Led OFF
書桌燈 | 葛志聖 | 葛志聖的燈泡 | A4CF125D3378 | 1 | Led ON / Led OFF
夢夢的燈 | 曹永忠 | 曹老師的燈泡 | A4CF125D10B4 | 1 | Led ON / Led OFF
奶咪小燈 | 曹永忠 | my BedRoom Ceiling Light(臥室頂燈) | 240AC405A228 | 1 | Led ON / Led OFF
奶咪小燈 | 曹永忠 | aaaaaaaaa | 246F289DB0C4 | 1 | Led ON / Led OFF
Student：王仁杰 REN,JIE. WANG
葛志聖 KO,CHIHSHENG
李奇陽 LI,CHI YANG
何柳霖 HO, LIU LIN
周柏綸 CHOU,PO LUN

結論

討論、結論與未來展望

- 討論
- 結論

討論

一. 環境監控能否即時化、普及化與高精確性，或許目前人類能否安居樂業的關鍵要因。基於物聯網興起，感測器技術、網際網路與雲端運算極大數據技術的發展進步，分散式架構改變了感測物件與系統之建置的架構，物聯網技術為大量與多類型感測物件之不確定性提供了許多解決方案。

二. 運用物聯網的架構，將感測器物件化，並建立標準的通訊標準界面連接監控雲端平台，透過物聯網的架構將感測物件與平台建立動態連結技術，建立更具彈性的環境監控系統。

結論

一. 本研究提出運用物聯網系統架構之環境監控系統之設計與開發，不同於過去環境監控系統的建置，大部分的資訊系統都是事先規劃站點與每一個站點的感測裝置數量與類別，方才開發、建置資訊系統。而在環境監控系統在運行後，才發現系統變更、升級都需要大量的時間與成本，不但耗時且不符合經濟效益。

二. 透過實際操作建立原型系統進行測試與驗證，針對監測點環境提供了執行環境中監測，透過大量感測裝置進行測試，經由傳送至本研究的雲端平台，可實際上線且持續運作並更新環境數據。

結論

三. 經本研究原型系統實證上證明，基於物聯網系統架構未來將可以提供更具彈性且低成本建置環境監控系統，能夠簡單性、可擴充性及即時回應相對環境條件，同步監測與控制對應環境達到預警、安全與節能整體效益。

四. 在物聯網架構的環境監控系統下，所有的感測物件可以進行動態調節，監控站亦可動態顯示多類別與不同數量的感測資訊，本研究並結合e化政府中央氣象局開放資料平台，即時將四百餘筆氣象監控站資料整合到雲端平台，並整合台灣圖霸地圖平台圖資技術，讓本環境監控系統可用縮放地圖顯示方式顯示所有監控站。

ACKNOWLEDGMENT

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Q & A

自我介紹

- 曹永忠 (Yung-Chung Tsao)，國立中央大學資訊管理學系博士，目前在國立暨南國際大學電機工程學系與應用材料及光電工程學系擔任兼任助理教授與自由作家，專注於軟體工程、軟體開發與設計、物件導向程式設計、物聯網系統開發、Arduino開發、嵌入式系統開發。長期投入資訊系統設計與開發、企業應用系統開發、軟體工程、物聯網系統開發、軟硬體技術整合等領域，並持續發表作品及相關專業著作，並通過台灣圖霸的專家認證
- Email:prgbruce@gmail.com
- Line ID：dr.brucetsao
- WeChat：dr_brucetsao
- 作者網站：https://www.cs.pu.edu.tw/~yctsao/
- 臉書社群(Arduino.Taiwan)：https://www.facebook.com/groups/Arduino.Taiwan/
- Github網站：https://github.com/brucetsao/
- 台灣圖霸：https://www.map8.zone
- Youtube：https://www.youtube.com/channel/UCcYG2yY_u0m1aotcA4hrRgQ