

Application of CNN and WSNs for Epidemic Prevention

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Abstract(摘要)

COVID-19 (新型冠狀病毒) disease has since spread worldwide, leading to an ongoing pandemic since 2020. In this project, constructed a system that is at a low cost by using **Android APP**, **MLX90614** and **RFID** with a **Buzzer**. Which can be set up on the public transportation.

Statement of Problems

COVID-19 was an infectious disease caused by the SARS-CoV-2 virus since 2019. Because none of the strategies for epidemic prevention was cheap (大眾交通工具上沒有一項便宜的防疫產品), therefore, the system was built. To prevent epidemic at a low cost in public transportation.

Neural Networks Training

After using **Convolution Neural Networks** and **Caffe Model** training with **20 epochs**, received the highest validation accuracy (驗證準確度) of face-mask wearing detection.



Conclusion(結論)

COVID-19 must have had a considerable impact on the world since 2020. The core values of this system are *low cost* (低成本) and *machine vision* (電腦視覺). This system can be said to be a weapon in epidemic prevention of public transportation! (大眾交通工具防疫系統)

Members(團隊介紹)

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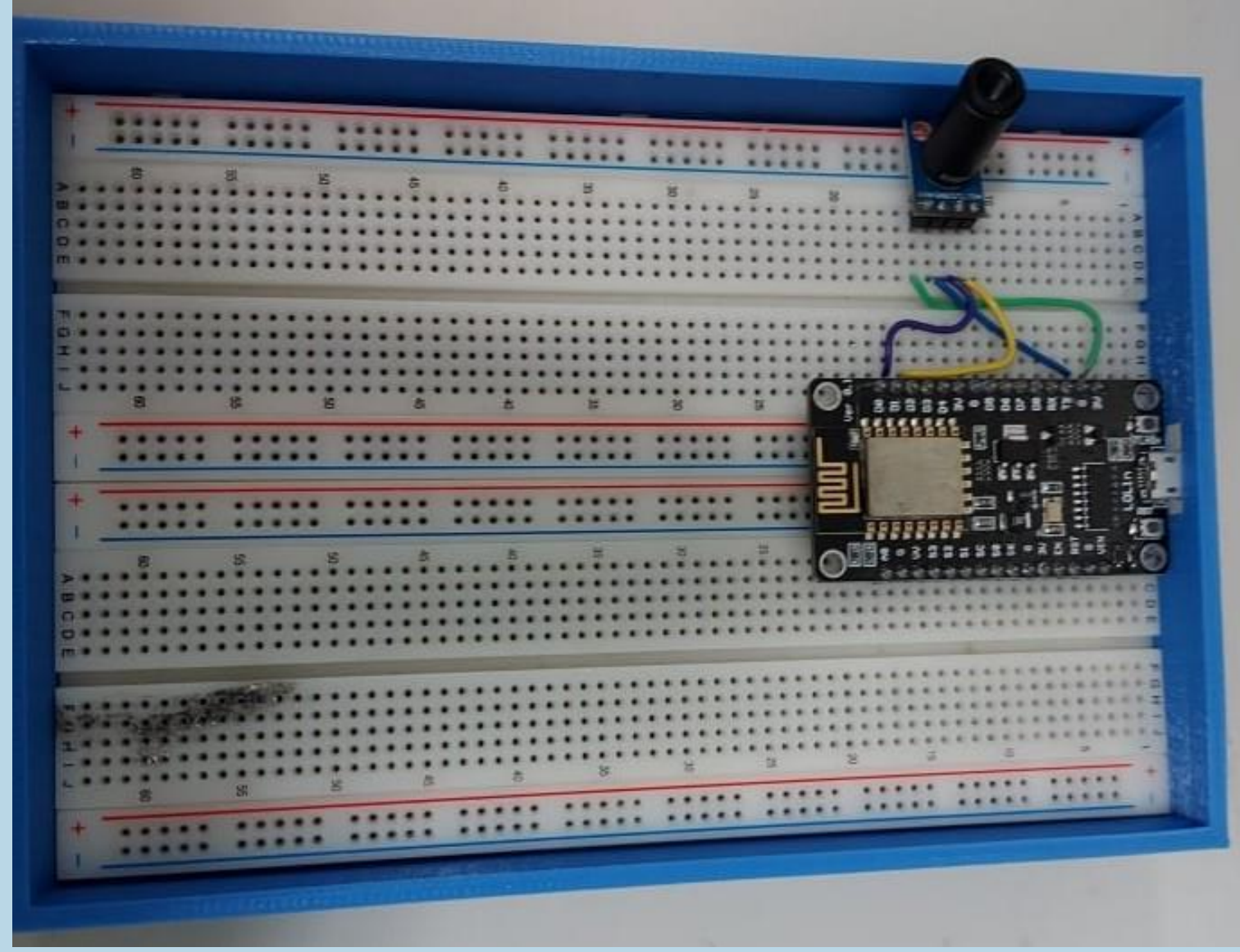
Thematic Results(研究成果)



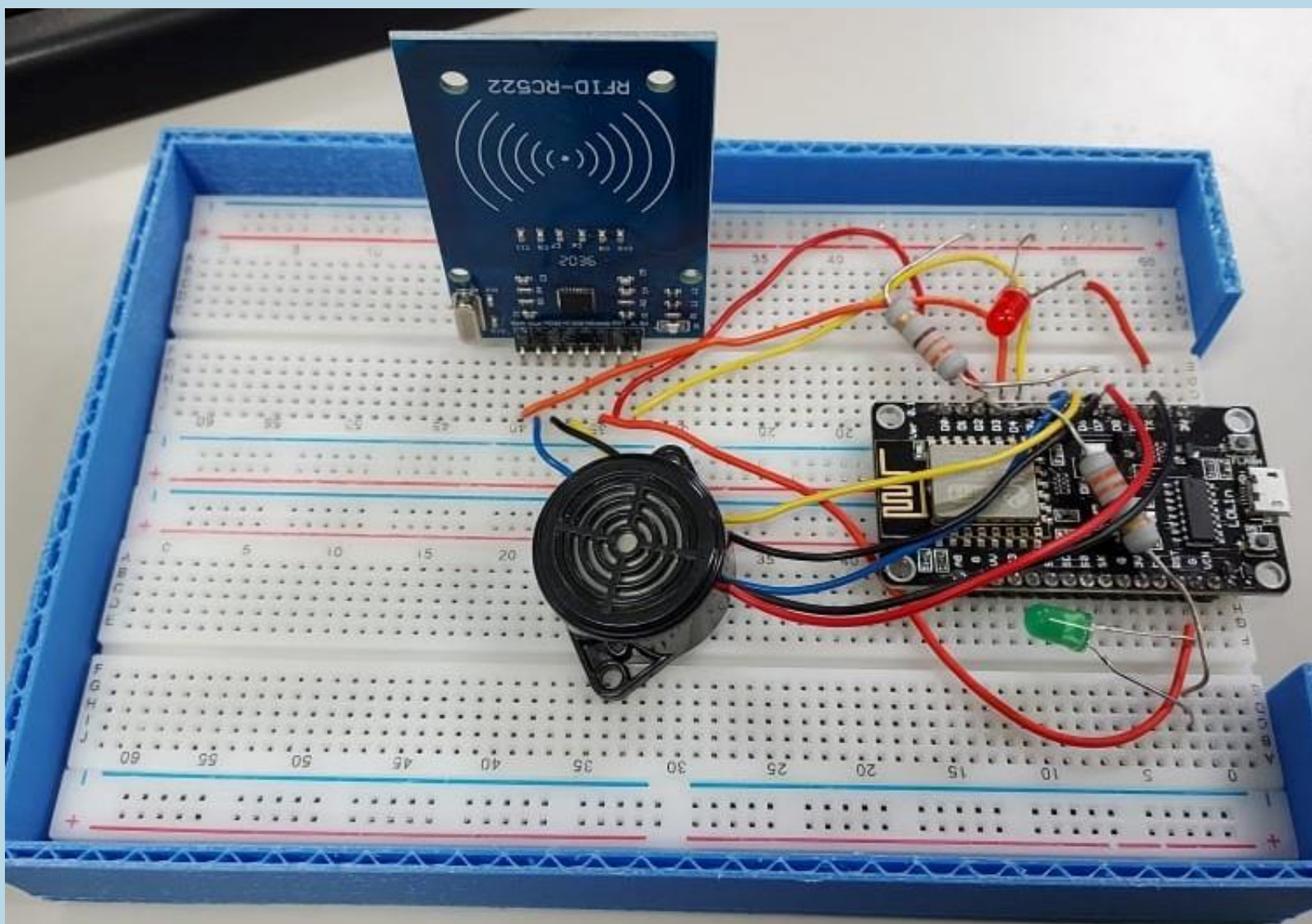
Face Masks Detector APP
Without Mask
(口罩偵測 APP 未配戴口罩示意圖)



Face Masks Detector APP
With Mask
(口罩偵測 APP 有配戴口罩示意圖)



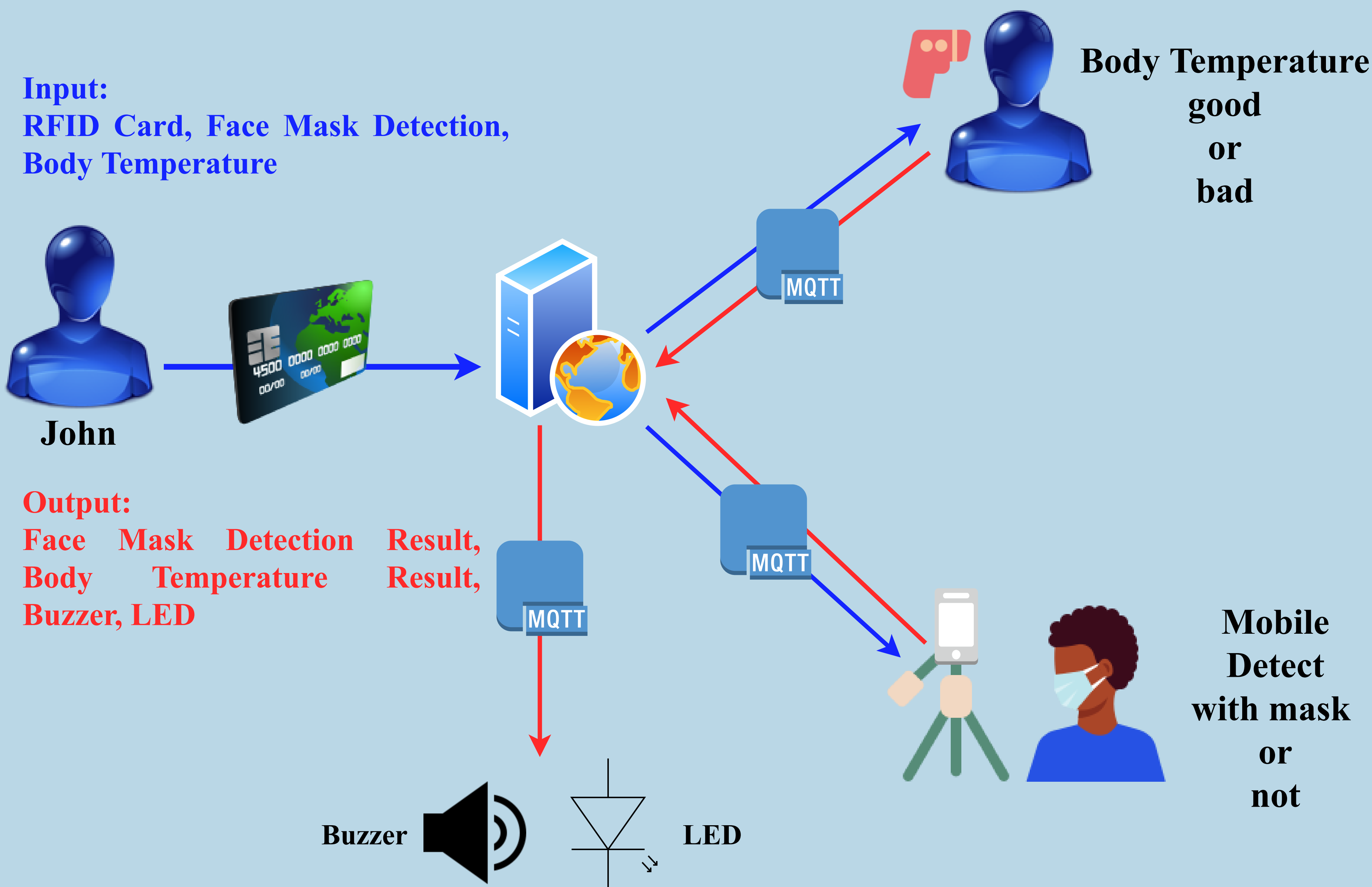
Human Body Temperature Sensor
(人體體溫溫度感測器)



RFID with Buzzer & LED System
(蜂鳴器、LED、刷卡系統)

Method and Process(實作方法與步驟)

First, a passenger walks through the doorway and swipes an RFID card(首先刷卡). After swiping the RFID card, *Epidemic Prevention Inspector*(打開防疫督察官) will open the Android APP for face-mask detection(檢查口袋配戴) and open MLX90614 for the human body temperature measuring(體溫量測). If both face-mask detection and human body temperature are ok, the buzzer will buzz not sound but LED will be blinked(都符合標準，LED 會閃爍). That is to say, either human body temperature not ok or face mask was not wearing, the buzzer will buzz for a specific sound(其一不符合標準，蜂鳴器會叫出特定聲音). In this case, the communication method of our system's integration is using MQTT. (此系統串接與整合是使用MQTT)



Architecture of Epidemic Prevention Inspector