

把識別證收起來吧 利用人臉辨識代替出勤打卡與門禁監控

Microsoft Azure MVP
maduka 白俊毅



關於我

- Microsoft MVP
 - ASP.NET
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- 大學入學考試中心-高級專員
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- 快三電商-系統研發部經理
- Skilltree兼任講師



忘了帶卡

無法刷卡

點名了！



我人都到了
為什麼還要用卡片證明我有到？

Microsoft Cognitive Service

ProjectOxford : 牛津計劃，於Microsoft Build 2015開發者大會中發表
允許開發人員創建更智能的應用程序
即使應用程序開發人員不是這些領域的專家
也可以進行識別面孔和解釋自然語言等操作。

Microsoft Cognitive Service

 Microsoft

Cognitive Services

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Vision	Speech	Language	Knowledge	Search
Computer Vision	Bing Speech	Bing Spell Check	Academic	Bing Autosuggest
Content Moderator	Custom Speech Service	Language Understanding	Entity Linking	Bing Image Search
Emotion	Speaker Recognition	Linguistic Analysis	Knowledge Exploration	Bing News Search
Face		Text Analytics	QnA Maker	Bing Video Search
Video		Translator	Recommendations	Bing Web Search
		WebLM		

臉部特徵點定位



更多更多...(論文)

[基於特徵點排除與雙重特徵點偵測之人臉辨識系統_臺灣博碩士論文 ...](#)
nditd.ncl.edu.tw/r/21750854397866796281

在特徵點之個數提升方面，我們提出結合SIFT與FAST (Features from ... 另一方面，基於人臉影像中五官位置之相似性，我們提出三種特徵點排除的機制，透過相對 ...

[\[PDF\] 檢視/開啟 - 中華大學](#)
chur.chu.edu.tw/bitstream/987654321/42777/1/GM097020330.pdf ▾

由彭國達 著作 - 2015 - [相關文章](#)
本論文提出一種搭配統計式降維演算法的特徵點雙向辨識之人臉辨識技術，藉由人臉上 ... 與輸入影像之人臉整體結構較不相同的人，接著以特徵點雙向辨識演算法，從剩 數對每種資料都適用，所以核方法的關鍵在於如何選擇適當的轉換函數；LLE.

[\[PDF\] 檢視/開啟 - CHUR](#)
chur.chu.edu.tw/bitstream/987654321/1603/1/NC089CHPI0392005.pdf ▾

由林志明 著作 - 2001 - [被引用 1 次 - 相關文章](#)

出多種方法，如利用顏色去辨識、從臉部取特徵點和辨識五官等...每種方法都有 ... 利用這些特徵點去代

表一張人臉的特徵，而利用這些特徵點，不但可以作人臉辨 ... 辨識 部位。使用特徵點(點數)忽略特徵點-特徵向量-個數-正確數/- 實驗張數 正確率 ...

[\[PDF\] 結合二維與深度影像資訊之人臉辨識技術概述 - LMS](#)
lms.ukn.edu.tw/sys/read_attach.php?id=2066 ▾

因此，結合兩者的優點，以實現一個實用且穩定的人臉辨識技術，為 ... 都需先將數個已知的人臉存入一

資料庫來進行 [18]則取出臉部的數個特徵點，包含內外眼角、...

[\[PPT\] 生物識別系統概論](#)
cnhuang.cpu.edu.tw/class/Security_Sys/Ch03.ppt ▾

人臉(face): 指紋(fingerprint); 虹膜(iris); 視網膜(retina); 手的幾何(hand geometry) ... 生物辨識目前的主流為指紋、聲紋、虹膜、臉部(生物特徵)、簽名辨識(行為特徵)。 ... 指紋的20~40 個特徵點，都高出甚遠。生物識別系統(Biometric Systems)手部特徵 ... 由於虹膜組織細節的形成與胚胎發生階段的環境有關，趨近於亂數形成，所以根據 ...

[\[PDF\] 以區域為基礎之表情辨識系統 - TANet2014](#)
tanet2014.kuas.edu.tw/ezfiles/28/1028/img/686/SS01-04.pdf ▾

Face API

Face API

- 完整的REST API可以呼叫使用

<https://westus.dev.cognitive.microsoft.com/docs/services/563879b61984550e40cbbe8d/operations/563879b61984550f30395236>

<https://www.microsoft.com/cognitive-services/en-us/face-api/documentation/overview>

Cognitive Services

APIs Documentation > API Reference

Face

- POST** Detect
- POST** Find Similar
- POST** Group
- POST** Identify
- POST** Verify

Face API - V1.0

Face - Detect

Detect human faces in an image and returns face locations, and optionally with faceIds, landmarks, and attributes.

- Optional parameters for returning faceId, landmarks, and attributes. Attributes include age, gender, smile intensity, facial hair, head pose and glasses. faceId is for other APIs use including Face - Identify, Face - Verify, and Face - Find Similar. The faceId will expire in 24 hours after detection call.
 - JPEG, PNG, GIF(the first frame), and BMP are supported. The image file size should be larger than or equal to 1KB but no larger than 4MB.
 - The detectable face size is between 36x36 to 4096x4096 pixels. The faces out of this range will not be detected.
 - A maximum of 64 faces could be returned for an image. The returned faces are ranked by face rectangle size in descending order.
 - Some faces may not be detected for technical challenges, e.g. very large face angles (head-pose) or large occlusion. Frontal and near-frontal faces have the best results.
 - Attributes (age, gender, headPose, smile, facialHair, and glasses) are still experimental and may not be very accurate. HeadPose's pitch value is a reserved field and will always return 0.

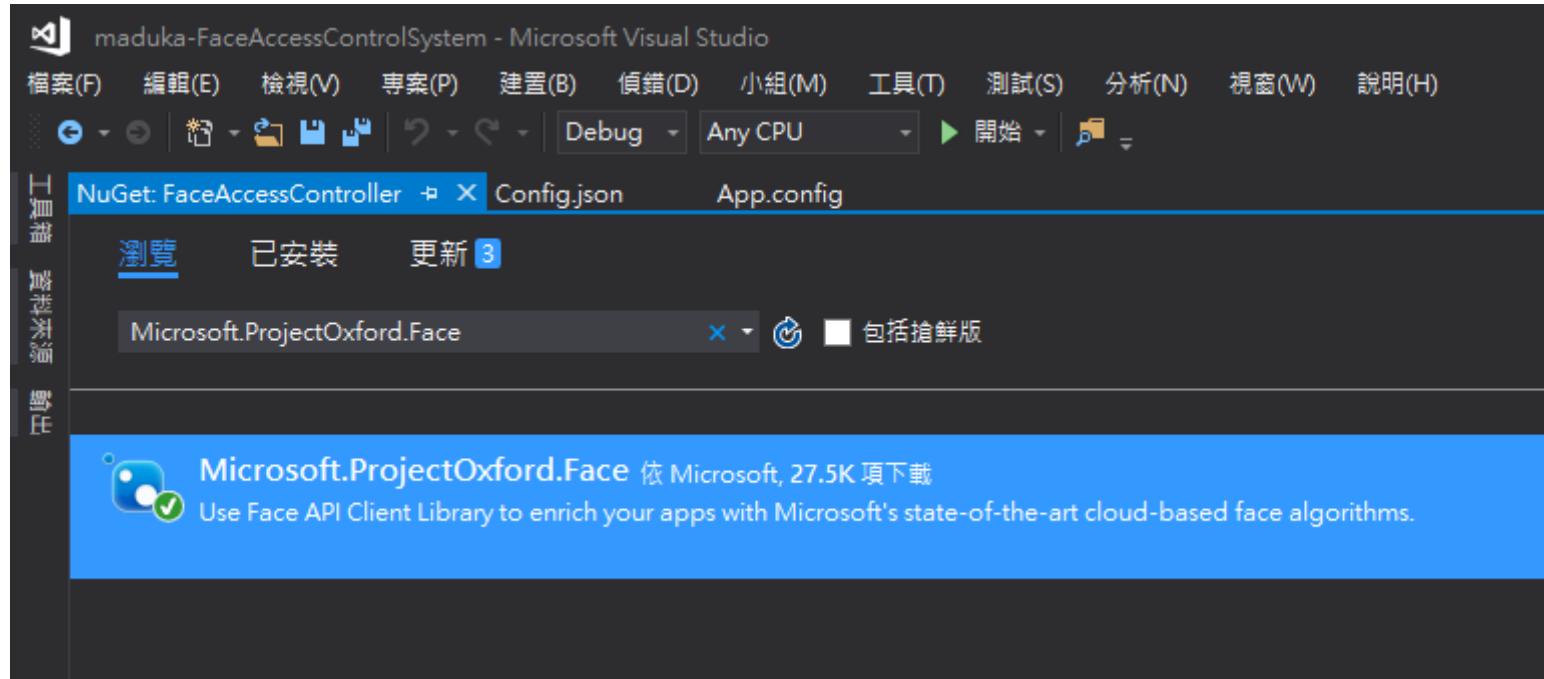
Http Method

POST

[Open API Testing Console](#)

Face API

- 直接安裝Nuget套件



Face API

• 使用Microsoft.ProjectOxford.Face的好處

- 不用事先上傳檔案到網路上
- 提供快速與好用的方法(Method)可以直接使用
- 無需直接操作REST API及JSON資料
- 不用擔心服務異動，直接更新套件即可
- 支援非同步模式傳輸
- 開源於Github，可自行下載修改，亦可直接提出Issue
<https://github.com/search?q=org%3AMicrosoft+Cognitive>

非常建議.NET開發人員直接使用

We've found 41 repository results

[Microsoft/Cognitive-Documentation](#)

Documentation for Microsoft Cognitive Services

● PowerShell ★ 92 ⚡ 89 Updated 14 hours ago

[Microsoft/Cognitive-Samples-IntelligentKiosk](#)

Welcome to the Intelligent Kiosk Sample! Here you will find several demos showcasing workflows and experiences built ...

● C# ★ 97 ⚡ 63 Updated 24 days ago

[Microsoft/CNTK](#)

Microsoft Cognitive Toolkit (CNTK), an open source deep-learning toolkit

● C++ ★ 9,886 ⚡ 2,427 Updated a minute ago

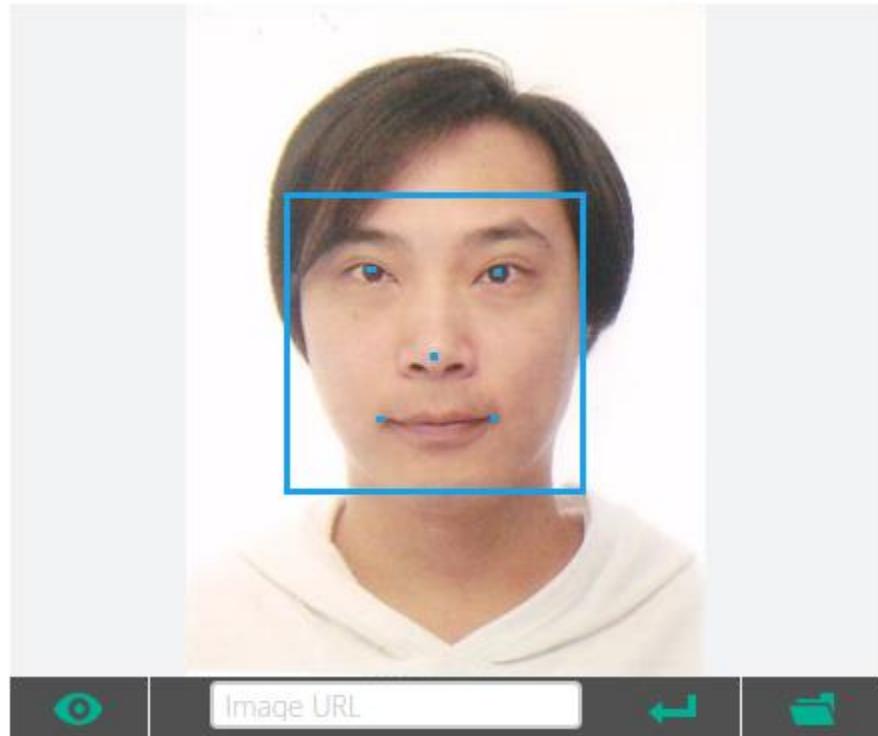
[Microsoft/Cognitive-LUIS-Windows](#)

Windows (.Net) SDK for the Microsoft Language Understanding Intelligent Service API, part of Cognitive Services

● C# ★ 65 ⚡ 33 Updated 26 days ago

Face API

- Detect (取得臉部資訊)



```
Detection Result:  
JSON:  
[  
 {  
 "faceId": "37b1a3aa-da5f-4a11-a515-1ddfa69b5f8e",  
 "faceRectangle": {  
 "width": 193,  
 "height": 193,  
 "left": 62,  
 "top": 119  
 },  
 "faceLandmarks": {  
 "pupilLeft": {  
 "x": 117.7,  
 "y": 169  
 },  
 "pupilRight": {  
 "x": 198.6,  
 "y": 170.5  
 }  
 }  
 }]
```

這張照片、這張臉的Guid

這張臉在照片的位置(定位)

其他的辨識資訊

- 1.瞳孔
- 2.鼻尖
- 3.嘴角
- 4.性別
- 5.年齡
- 6.鬍子
- 7.笑容
- 8.戴眼鏡?

<https://westus.api.cognitive.microsoft.com/face/v1.0/detect>

Face API

- Verify (比對並確認是否為同一人)
 - 每一張照片都會賦予Guid
 - 使用兩組Guid進行比對

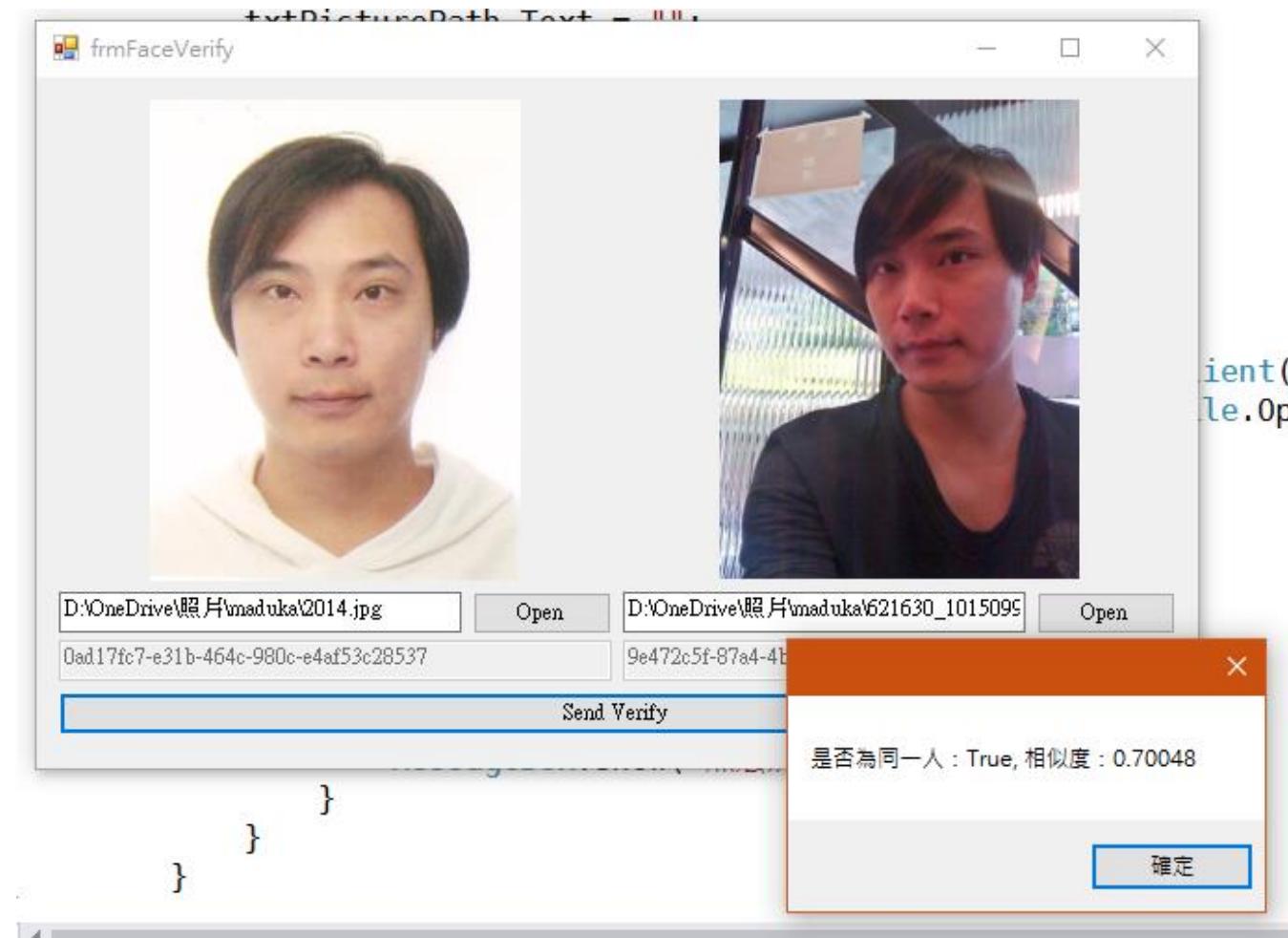
<https://westus.api.cognitive.microsoft.com/face/v1.0/verify>

Input

```
{  
    "faceId":"c5c24a82-6845-4031-9d5d-978df9175426",  
    "personId":"815df99c-598f-4926-930a-a734b3fd651c",  
    "personGroupId":"sample_group"  
}
```

Output

```
{  
    "isIdentical":true,  
    "confidence":0.9  
}
```



Face API

- Identify (識別臉部並進行群組清單的驗證)

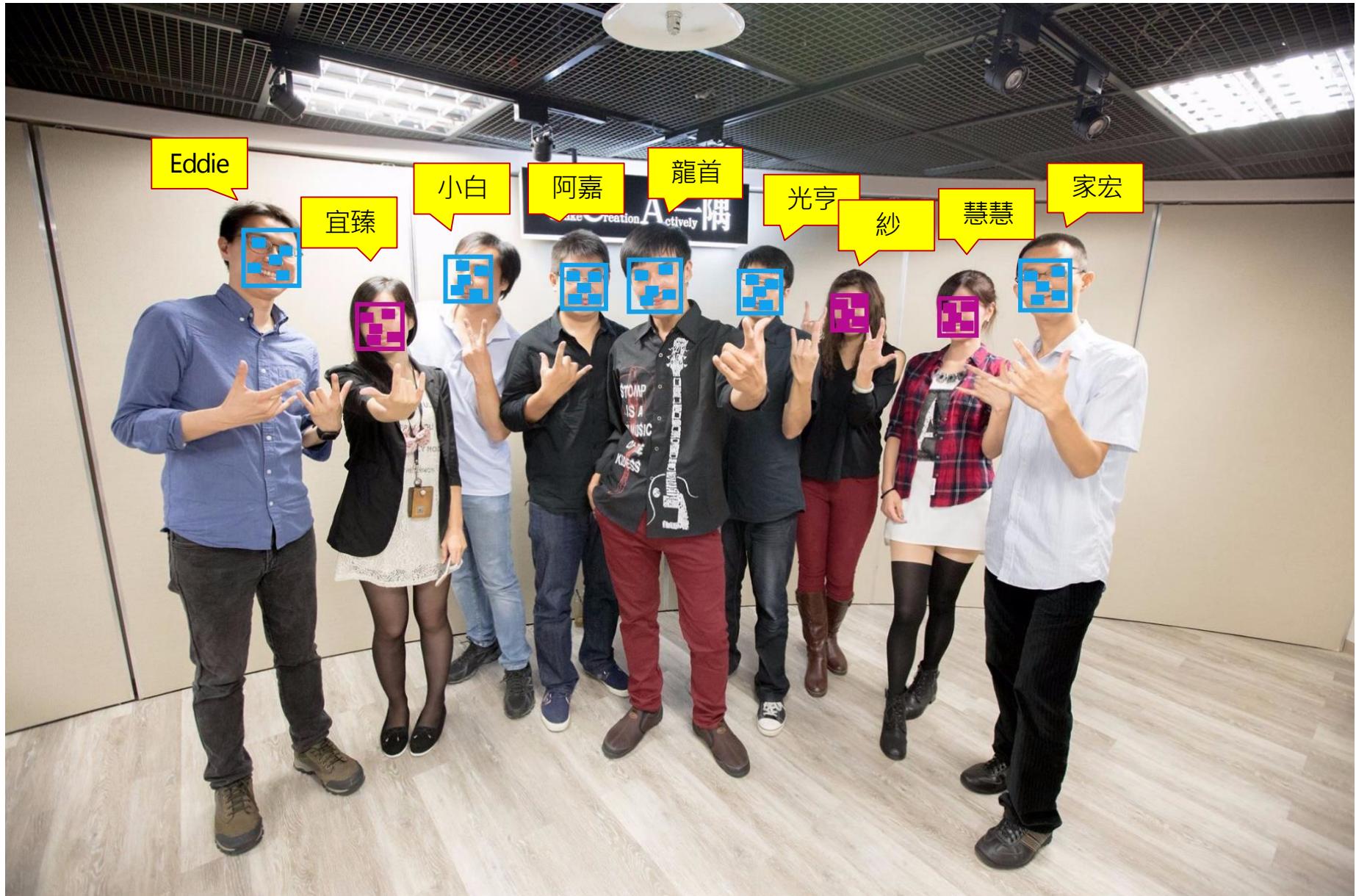
<https://westus.api.cognitive.microsoft.com/face/v1.0/identify>

```
{  
  "personGroupId": "sample_group",  
  "faceIds": [  
    "c5c24a82-6845-4031-9d5d-978df9175426",  
    "65d083d4-9447-47d1-af30-b626144bf0fb"  
  ],  
  "maxNumOfCandidatesReturned": 1,  
  "confidenceThreshold": 0.5  
}
```



Face API

- This Picture
- Detect
- Identify



Face API

- Identify

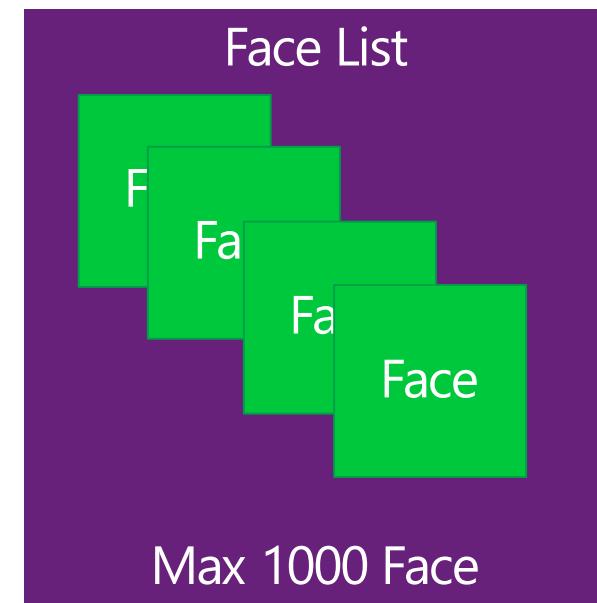
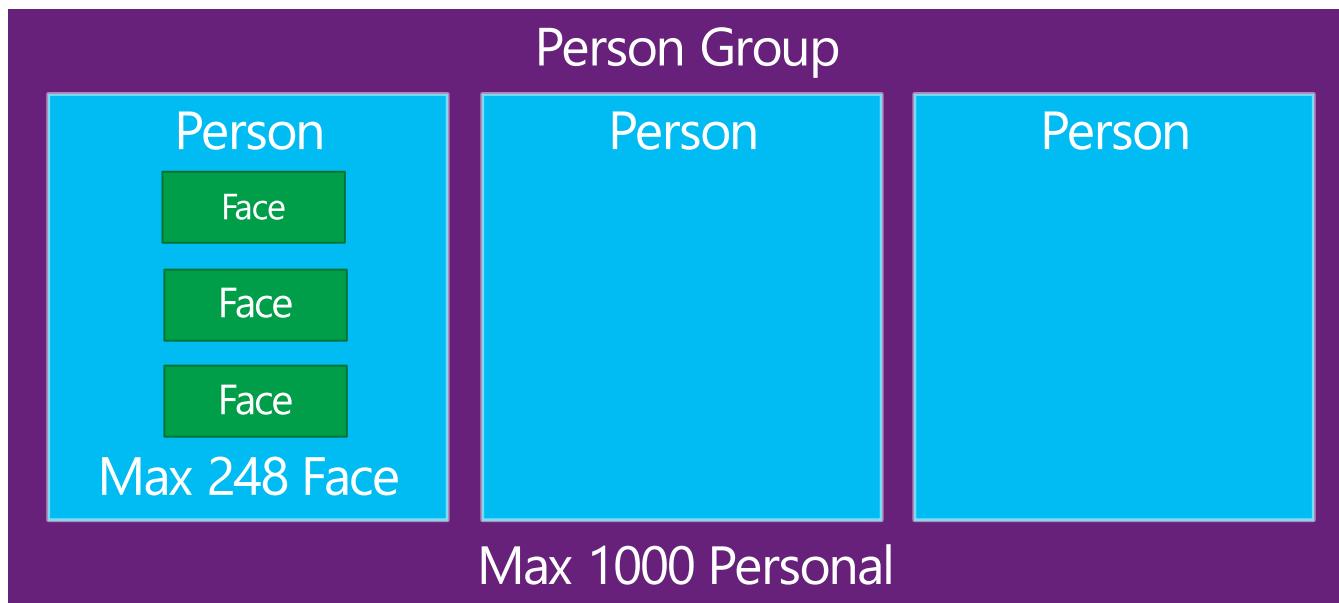
- 可以預先上傳群組及人員照片 (Person Group)
- 指定照片中進行人像的比對
- 比對的步驟
 - 上傳的照片 → 取得FaceId
 - 傳入FaceId + Person Group Id
 - 回傳照片中比對出的PersonId



Face API

- Personal Group (群組)
 - Person (人員)
 - Face List (人員臉部照片清單)

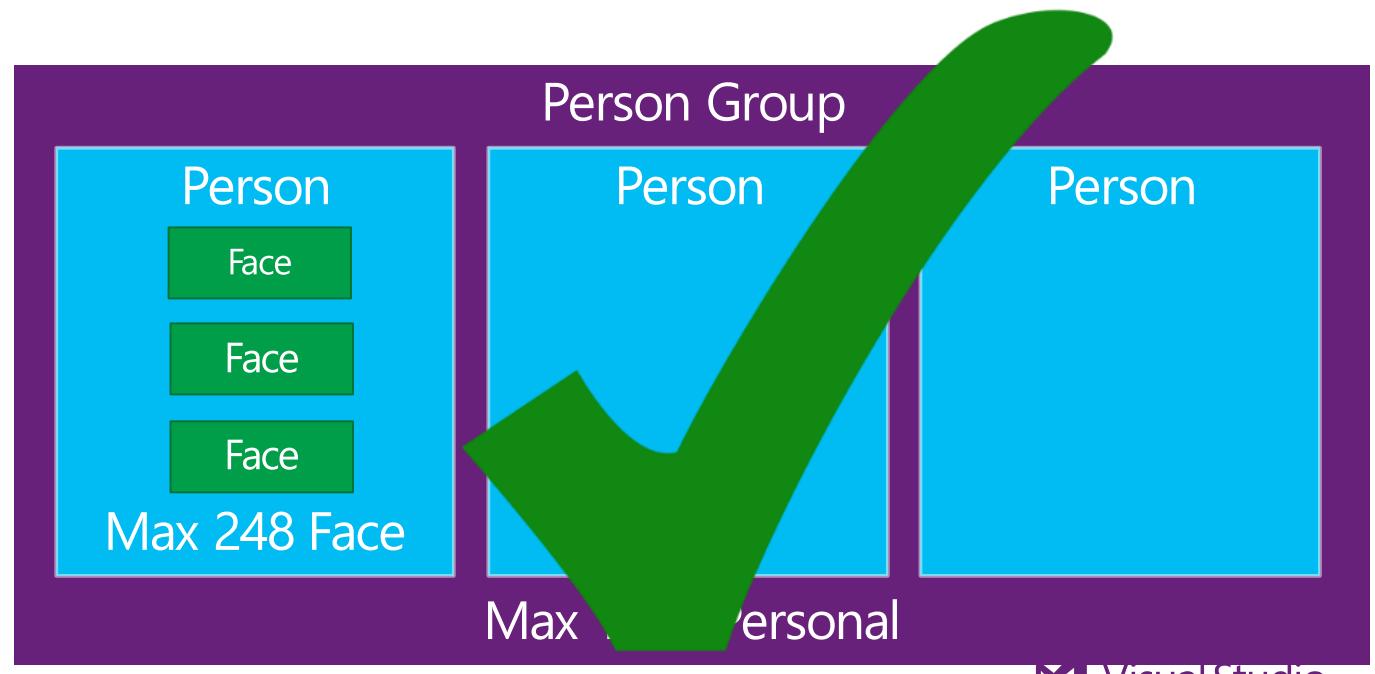
Face List 僅能用在
“尋找類似臉孔”
Find Similar



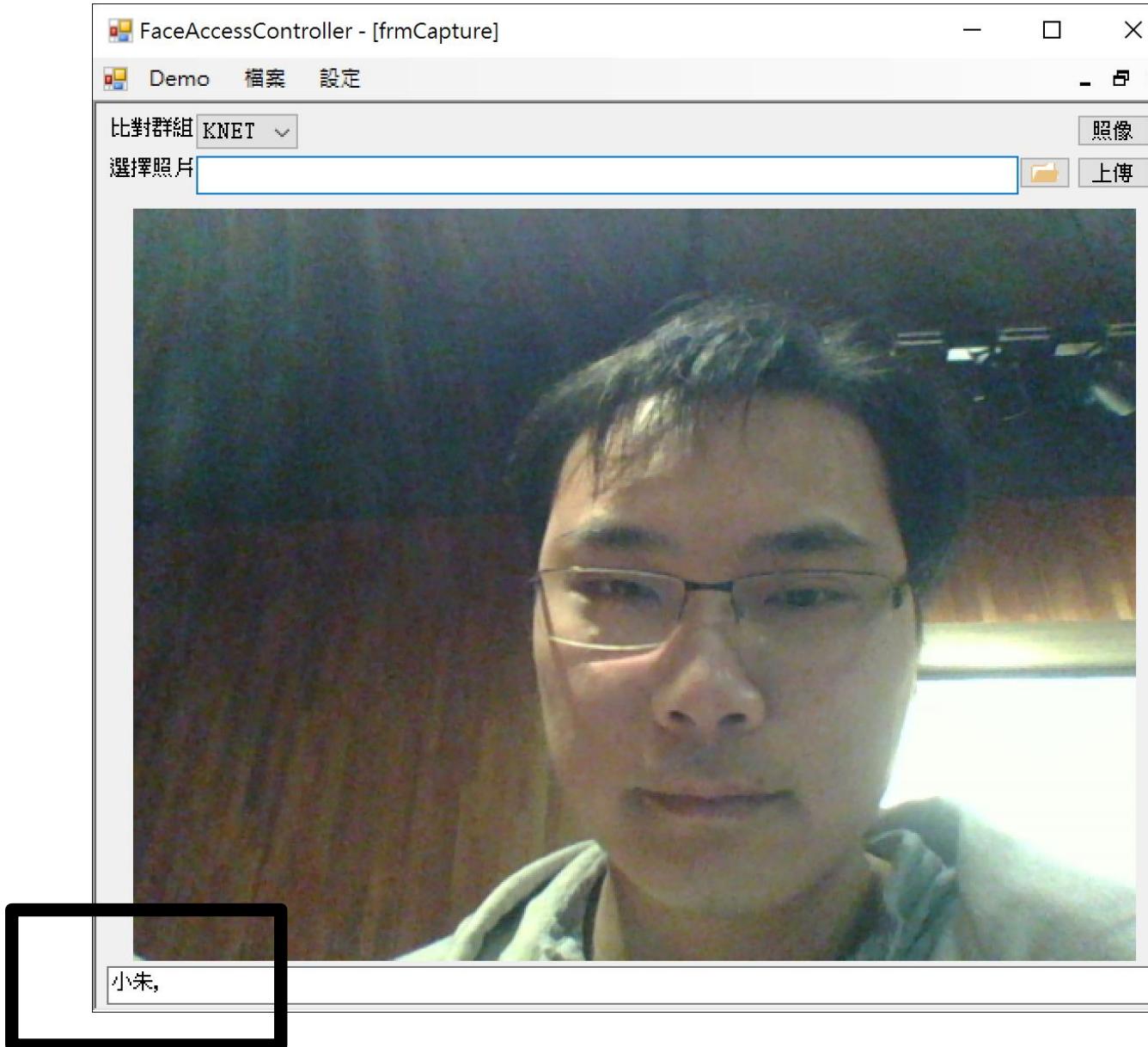
Face API

- Personal Group
 - Create Person Group
 - Create Person
 - Add Person Face
 - Add Person Face more...
 - Train Person Group

完成訓練
可以開始進行比對動作

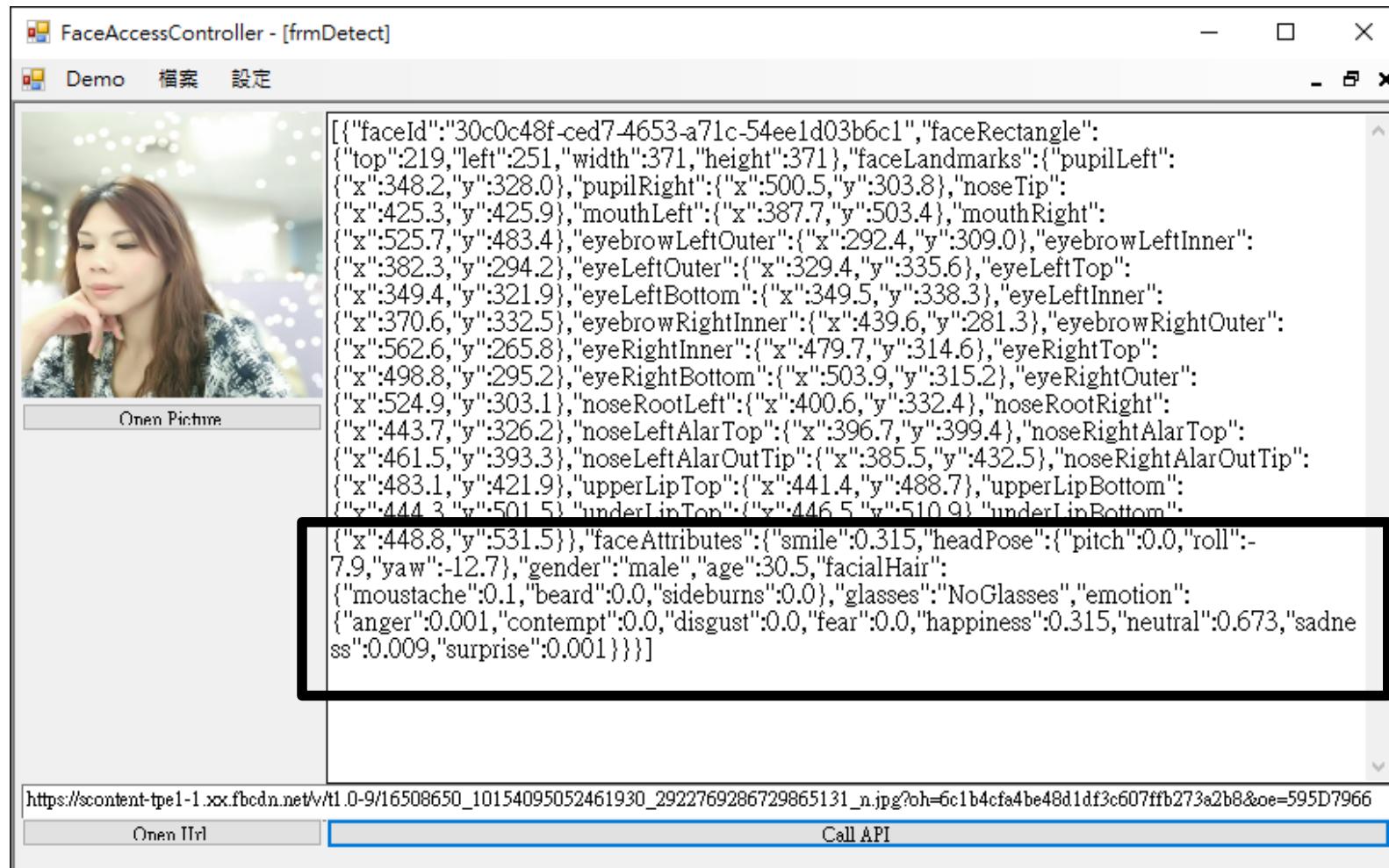


題外話



Face API

- 加入參數作到部份Emotion辨識
- 性別
- 年齡
- 情緒

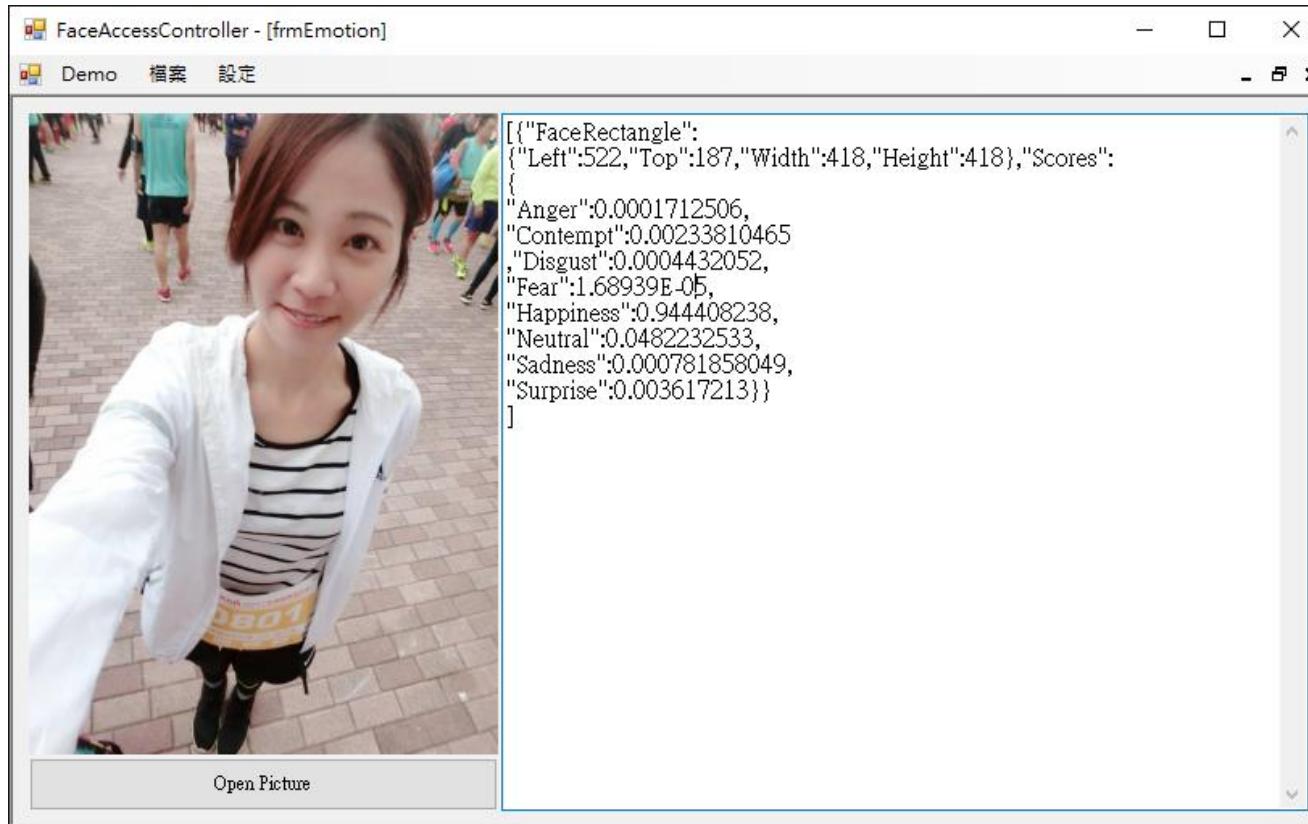


Emotion API

Emotion API

- Emotion Recognition (感情識別)

- 憤怒
- 鄙視
- 厭惡
- 恐懼
- 幸福
- 中性
- 悲傷
- 驚喜



Computer Vision

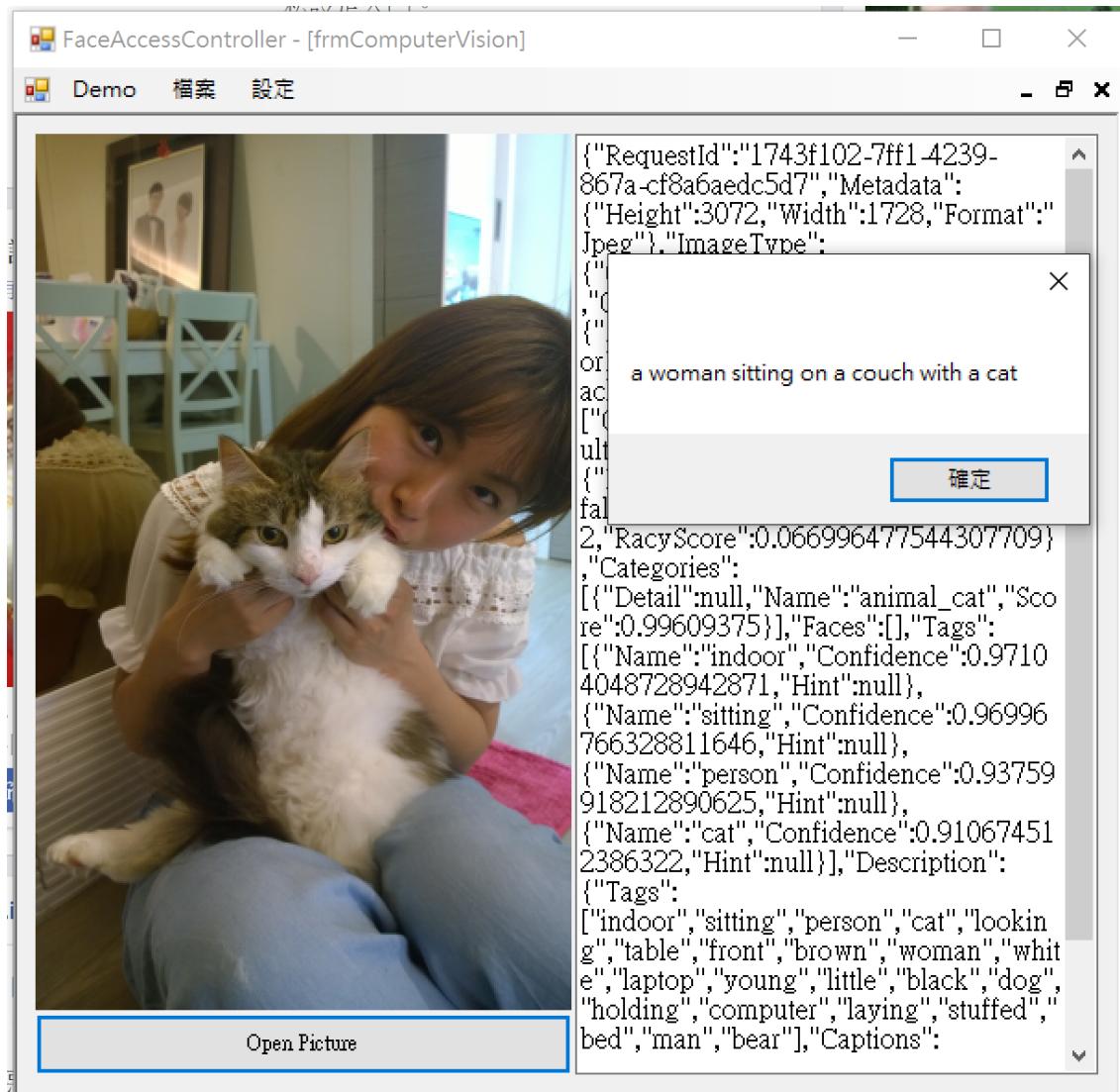
Computer Vision API

- Saqib Shaikh
 - Join Microsoft 10 Years
 - Software Engineer



Computer Vision API

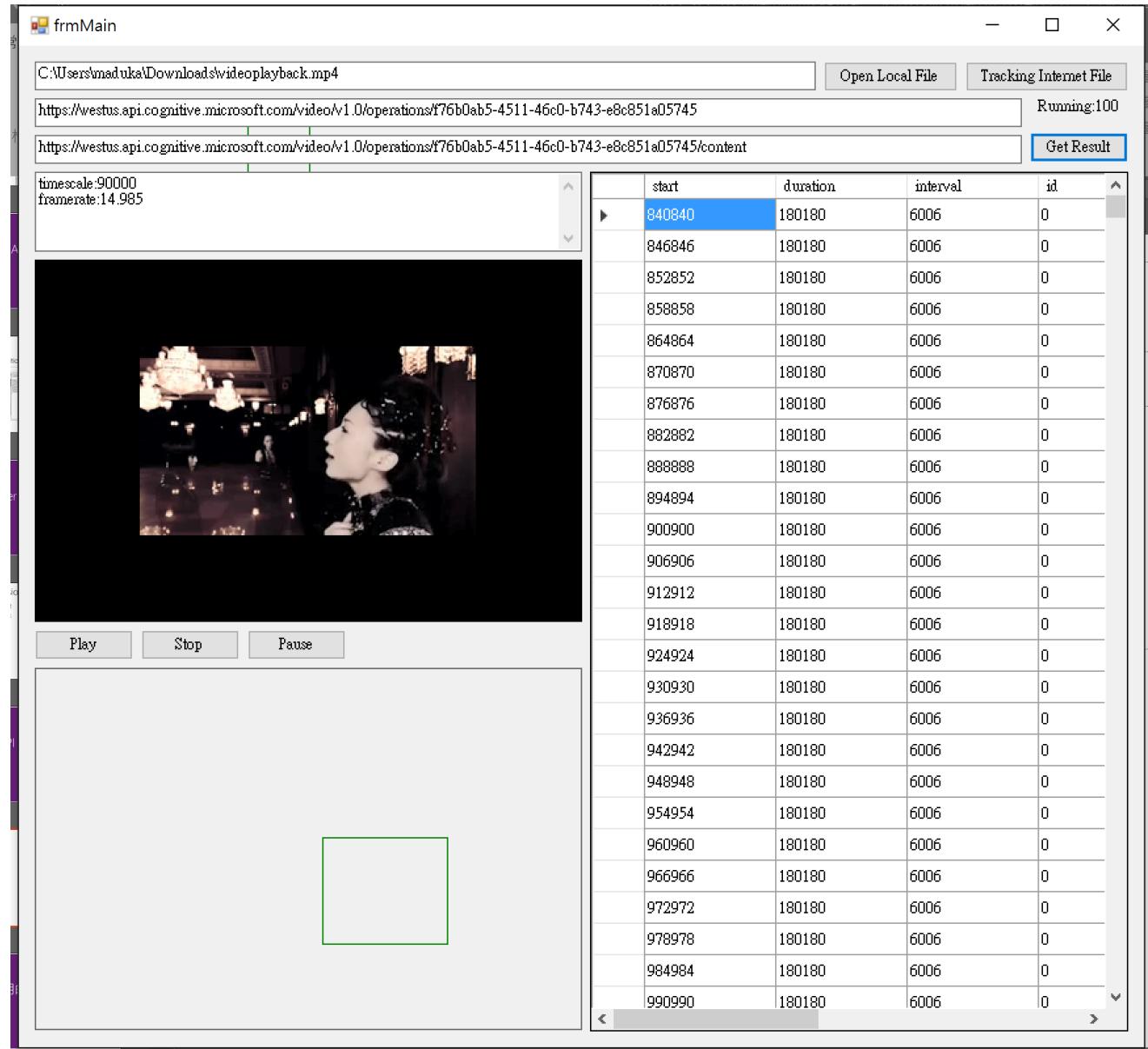
- 描述照片的內容
- 找出人臉的物件
- 辨識物品的Tag



Video API

Video API

- 取得影片的人臉位置
- 取得影片中移動狀態
- 穩定影片的搖晃狀態
- 目前還在Preview
 - 每個月最大取得結果次數1,200
 - 每個月最大取得運作次數12,000
 - 5分鐘/最大100MB檔案
 - 個別功能每個月
最多執行300次/每分鐘1次



可以運用的情境

上下班打卡

- 人到就直接打卡上班
- 經過門口就算數
 - Face API
 - Person Group
 - Detect / Identify



會議室/討論室借用

- 快速借用登記
- 進出管理
 - Face API
 - Person Group
 - Detect / Identify



學校點名

- 教室放置Camera進行辨識
- 易於確認學生所在位置
 - Face API
 - Person Group
 - Detect / Identify



犯人比對

- 目標族群即時比對
 - Face API
 - Detect / Find Similar



門禁安全管理

- 危禁品識別
- 人臉進出入辨識
 - Computer Vision API
 - Face API
 - Detect / Identify



居家安全照護

- 行動狀態識別
- 情緒識別
 - Computer Vision API
 - Emotion API

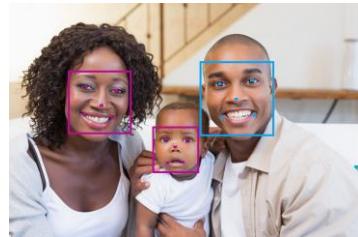
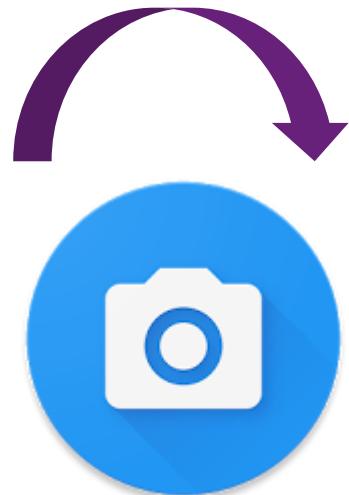


更多更多 !!

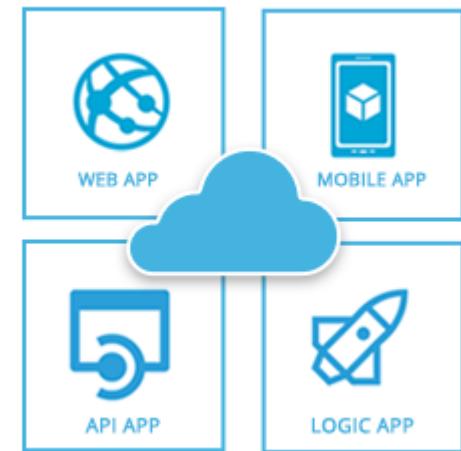
最後

- 讓我們回到主題-建議的架構與解決方案

持續截取串流畫面



雲端服務，進行人臉識別
後續系統整合與應用



先透過Cam進行人臉補捉
避免不必要的雲端流量與請求



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