



# **Augmented Reality Android App**

## **With Optical Character Recognition, Text Translation and Facial Recognition**

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## Motivation

When we read a newspaper that is written in other language, we may suffer difficulty to understand the content of the article, especially when the article is written in the language we never used.

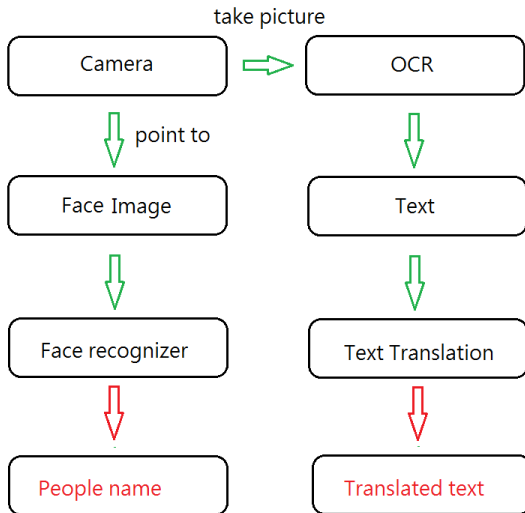
Meanwhile there is always a picture in header article and some people are captured, and most of the time, we cannot know all of them!

We have developed an App, which aims to make life easier – to assist user when user is reading some materials like leaflet, newspaper, website...etc.



## Design

### Work Flow



### Software used:

FQL  
Eclipse with Android SDK, NDK  
TesseractOCR  
Microsoft Translator  
jTessBoxEditor  
Serak Trainer For Tesseract 3.0X  
OpenCV manager

For our Database  
Compiler  
Open Source OCR engine  
Online translator API  
Create tiff and box file  
Create trained data  
Open Source Computer Vision Library



# Design description:

## Text Translation

As well as other Augment Reality App, our App is highly rely on using the camera. After users take photo of the text paragraph, they can select to translate only part of the paragraph in the photo.

After users select the paragraph to translate, OCR would translate the image to text, and Microsoft translator would translate the text to user-expected language.

And user can pass the translated text to YouTube and Google, which make the App user-friendly.

**B4 BUSINESS COMPANIES & FINANCE**  
**SHOW OF STRENGTH**  
 Expenditure patterns of exhibition visitors, 2004/11

Shopping	34	Travel & tours	3
Meals	23	Entertainment	1
Household expenses	19	Others	18

**Big spenders put on a show**  
 Study finds exhibition sector generated an economic impact equivalent to 1.5pc of city's GDP in 2004, writes **Andy Cheng**

Exhibition visitors spent almost double the amount of ordinary travellers on Hong Kong, according to the latest study by the trade body. The Hong Kong Exhibition and Convention Industry Association (HKCIA) also found that the average expenditure of international visitors (US\$2,112) was 2.5 times that of local visitors (US\$829). The study, conducted by PwC, was the first of its kind to provide a comprehensive analysis of the economic impact of the exhibition sector in Hong Kong. It found that international visitors spent an average of US\$2,112 per year on the city, compared with US\$829 for local visitors. The study also found that the average expenditure of international visitors was 2.5 times that of local visitors. The study, conducted by PwC, was the first of its kind to provide a comprehensive analysis of the economic impact of the exhibition sector in Hong Kong. It found that international visitors spent an average of US\$2,112 per year on the city, compared with US\$829 for local visitors. The study also found that the average expenditure of international visitors was 2.5 times that of local visitors.

Can select to translate this paragraph only

**YouTube** Donald Tsang

共有 6,570 個播放量

[2012世界經濟論壇] 曾蔭權激勵演講 獲全場鼓掌 Donald Tsang's Speech at Davos 2012  
 影片建立者: johnnyccn · 2 年前 · 觀看次數: 22,110 次  
 曾蔭權對全球經濟家到港心潮澎湃解決新機香港 Donald Tsang is the chief executive of the Hong Kong Special Administrative ...

Donald Tsang Interview at Newsline 1  
 影片建立者: igetmjobsone · 4 年前 · 觀看次數: 10,859 次  
 18 Oct 2009.

**Google** Donald Tsang

網頁 圖片 新聞 影片 地圖 更多 · 搜尋工具

約 300,000 項搜尋結果 (0.39 秒)

**Donald Tsang - Wikipedia, the free encyclopedia**  
 en.wikipedia.org/wiki/Donald\_Tsang · 翻譯此條網頁

**Donald Tsang** Yam-kuen GBM, KBE (born 7 October 1944) was the second Chief Executive and President of the Executive Council of Hong Kong from 2005 to ...  
 Personal life · Government service · Chief Executive (2005–12) · See also

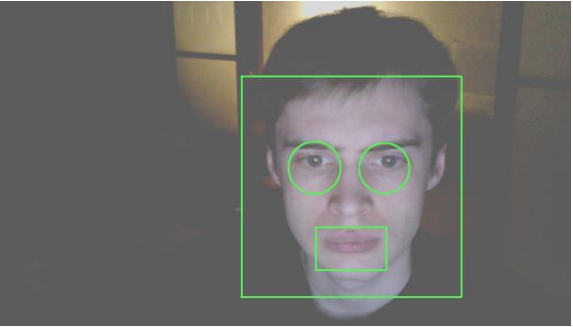
曾蔭權 - 維基百科，自由的百科全书  
 zh.wikipedia.org/zh-hk/曾蔭權 ·

曾蔭權爵士，大業勳勳，KBE ( Sir Donald Tsang Yam-kuen, 1944年10月7日 - )，前任香港特別行政區行政長官，他常戴眼鏡 ( 英語: bowtie · 粵語: 曾蔭權為「英

## Face Recognition:

Using the characteristic of Augment Reality, our App performs Real-time manipulation of camera image. Face would be detected and showed in camera. And when users use our App to search person, our App would return person name every second.

To make the App meaningful, we use Facebook query language (FQL) to extract HKUST people data from Facebook, instead of adding non-famous people data in the internet.



## FQL

```
String fqlQuery = " select name, uid from user where uid in (select user_id from like where object_id = 10152070431989473)";
```

**(Financial) (our track)**  
**The hunt is on for the 'best of the best'**  
 Judges for the SCMP/IFPAK Financial Planner Awards have narrowed down the field to three outstanding candidates, writes **John Cremer**

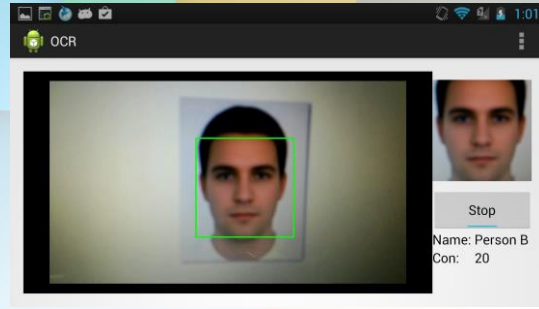
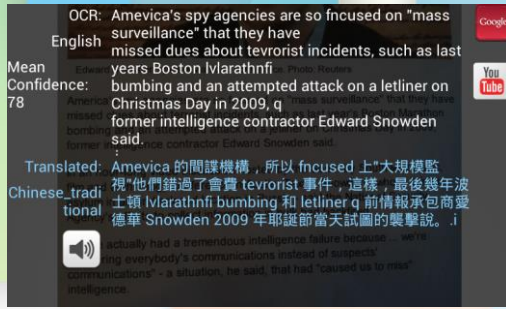
**THE HUNT** is on for the 'best of the best' as judges for the SCMP/IFPAK Financial Planner Awards have narrowed down the field to three outstanding candidates. The winners will be announced in early December. The judges are looking for the best of the best in the financial planning industry. The winners will be announced in early December. The judges are looking for the best of the best in the financial planning industry. The winners will be announced in early December. The judges are looking for the best of the best in the financial planning industry.

**Institute produces guide for members**  
 The SCMP/IFPAK Financial Planner Association has produced a new guide for its members. The guide provides information on the latest developments in the financial planning industry. The guide provides information on the latest developments in the financial planning industry. The guide provides information on the latest developments in the financial planning industry.

For Face Recognizer

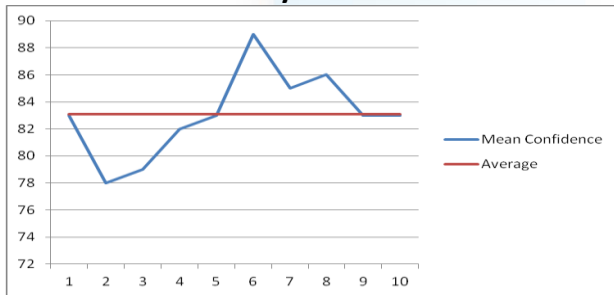
For OCR Text translator

# User interface

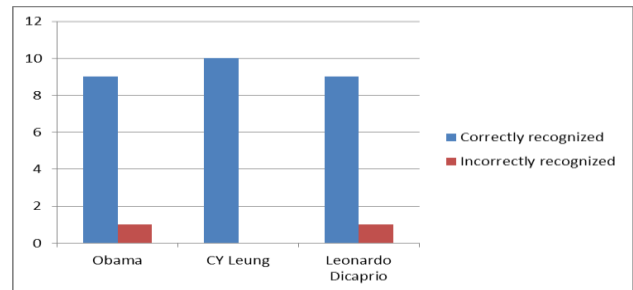


## Result

Accuracy of OCR:



Accuracy of Face recognition



## Conclusion

### We can do better:

#### 1. Word translation: Get the text at preview status of camera

Currently, our app only support to get the text that user wants from image. This limits the area of the text to be translated. If the text that user wants to translate is not inside the current image, user needs to take another photo before translate other text. If we have more time to do the project, we could done better on OCR function, we would make it OCR the text on screen in preview mode of camera, when user point the camera to the word that user wants to translate, it will automatically focus, get the OCR text and translate it, and then display translated meanings and replace the original text directly on screen. Since it needs to display the preview in the main frame, other process like translation will do in the background, it will also increase the speed of our system.

#### 2. Face recognition: Return more data rather than return name

For those who have "liked" HKUST Facebook fan page, we have extracted their name and profile picture in Facebook. If they have revealed their personal data in Facebook, It is achievable that we can extract more data from their Facebook account, like phone number, major, address.

## Peer evaluation: (max = 5)

