



# AI an introduction

Ho Chun Fee, Stanley

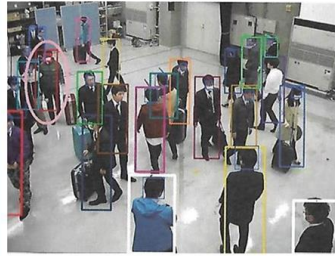
Retired HKCE Senior Lecturer 2013-2021

## Informatics Hong Kong



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BSc/NCC HD/Adv Dip





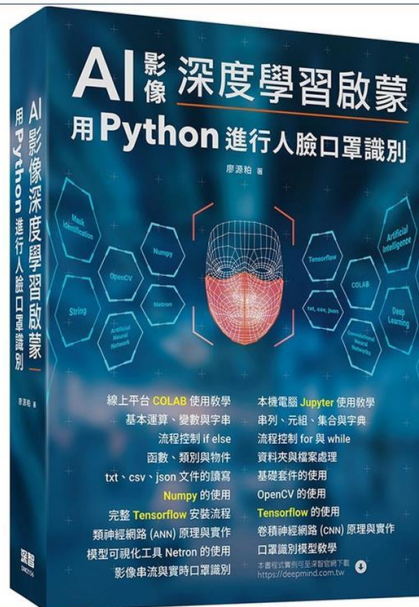
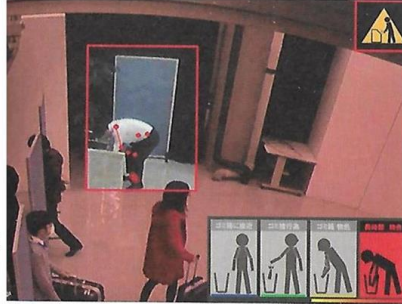
圖一：偵測到同時戴著口罩和太陽眼鏡的人(左上方粉紅色圓圈)之例. Ref: SECOM

我話比你聽我係保安丁牌退休教師,  
我有話過我係警察!

圖二：些機制可偵測到動作看起來像是放置可疑物品的人士. Ref: SECOM

### 主題：能發現可疑人士的AI影像辨識系統，從群眾中找出行跡詭異的人。

Ref: 100種連結世界的新技術,日經BP-編,楊毓登-譯.

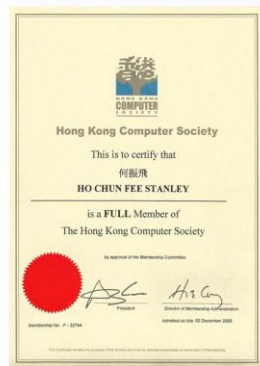
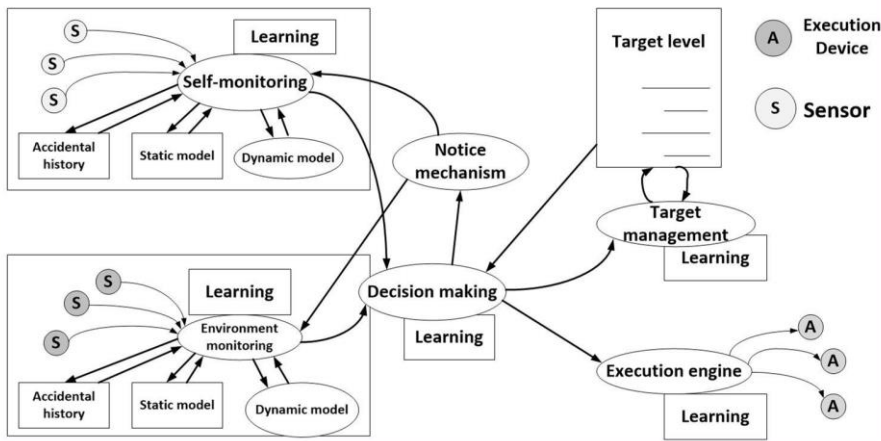


**Title: A kind of autonomy system structure.**

一種自主性系統的範例架構

AI chips develop to CPU, GPU, FPGA, and ASIC.

With autonomy AI chip  
帶自主性的人工智能晶片  
進行無休止的學習



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Life member of BCS and HKCS





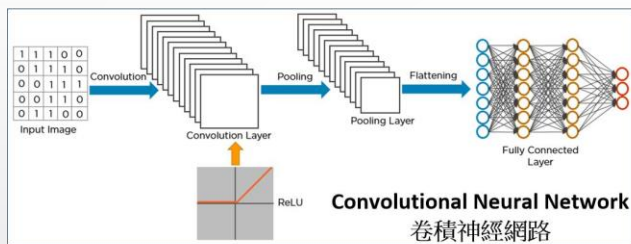
# The British Computer Society



香港都廣泛使用  
人工智能,  
掃地送餐  
機械人.

HK widely use  
AI robot.





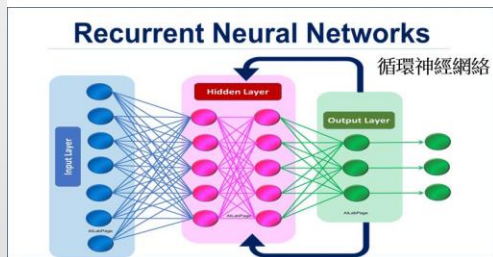
AI hardware chip, it needs software driver.

AI Introduction



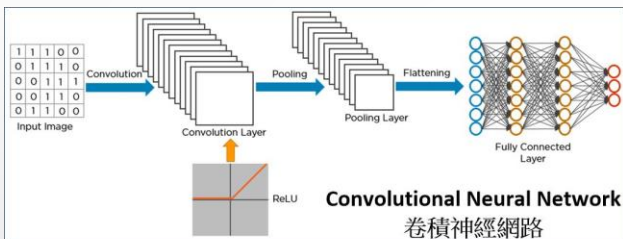
NVIDIA is leading GPU.

informatics



This two main types of network CNN and RNN to process machine learning.  
CNN good in analysing photo image;  
RNN good in analysing time sequences image, music, and diagram, the changing value.

Machine learning's recognition services, IBM Watson is the leader; but Microsoft running on behind; Microsoft Azure cloud services, it has API and Web application program, to development environment. Microsoft Azure Cognitive Services and can compare to Watson position, and has AI related technologies.



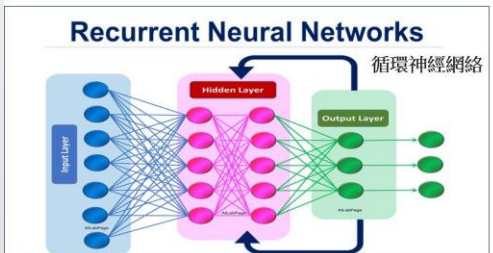
使用硬體,亦需要驅動程式.

AI介紹



NVIDIA 是 GPU的領航者.

informatics



這兩種主流神經網路CNN與RNN進行機器學習。  
CNN擅長辨識照片影像;  
RNN擅長分析時間序列的影像,音樂,圖表等數值變化.

機器學習的認知服務上, IBM Watson是領導者;但 Microsoft急起直追; Microsoft Azure雲端服務,有API及網頁應用程式,進行系統開發環境.此外 Microsoft Azure Cognitive Services可與Watson抗衡,備齊AI相關技術.



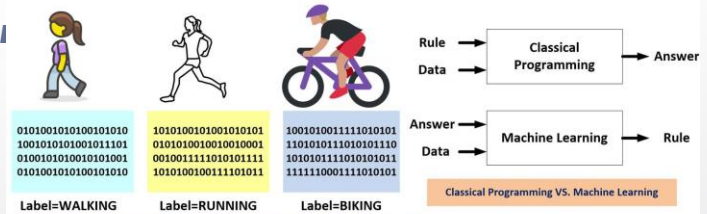
## Python AI Programming Language (人工智能使用的軟件)

- \*Establish the Python.
- \*Anaconda/Jupyter/VS Code :
  - Anaconda is the integration package, 91% AI Engineers use.
  - Anaconda uses as the Python development environment.
  - Suggest using Python 3.0 up version, i.e. version 3.6 or 3.8.
  - Anaconda can download on official web, around 400MB; data analysis program commonly use "Jupyter", it had been called IPython Notebook, it is the interactive notepad.
- \*Django: for easy execution of web page and browser uses to install Django.



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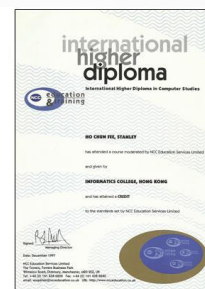
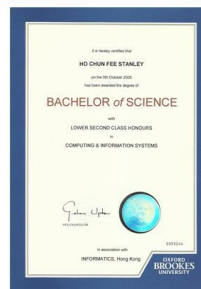
## AI Programming



From programming to ML : Collection and Annotate data  
Show machine learning's emoji

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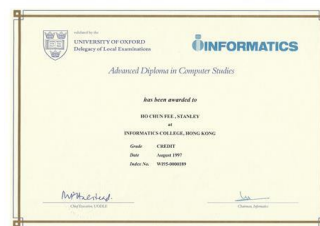




```
if(speed<4){
  status=WALKING;
}
```

```
if(speed<4){
  status=WALKING;
} else {
  status=RUNNING;
}
```

```
if(speed<4){
  status=WALKING;
} else if(speed<12){
  status=RUNNING;
} else {
  status=BIKING;
}
```



Ho Chun Fee, Stanley  
BSc(Hons) / NCC HD



0101001010100101010  
1001010101001011101  
0100101010010101001  
0101001010100101010

Label=WALKING

1010100101001010101  
0101010010010010001  
0010011111010101111  
1010100100111101011

Label=RUNNING

1001010011111010101  
1101010111010101110  
1010101111010101011  
1111110001111010101

Label=BIKING



Classical Programming VS. Machine Learning

From programming to ML : Collection and Annotate data  
Show machine learning's emoji



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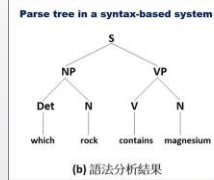
## AI Robot



# AI

S → NP VP  
 NP → Det N  
 Det → "what" | "which"  
 N → "rock" | "specimen" | "magnesium" | "radiation" | "light"  
 VP → V N  
 V → "contains" | "emits"

(a) 語法

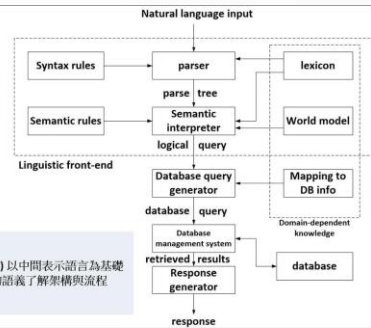


### AI 知識圖譜

基於語法解析 (Syntactic Parsing), 以語法解析為基礎的語義理解將自然語言 NLP 的複雜語義轉化為邏輯表達式。

(for\_every X (is\_rock X)  
 (contains X magnesium);  
 (printout X))

(c) 語義查詢



### LUNAR 系統利用語法樹解析初步解析問題





# AI Medical

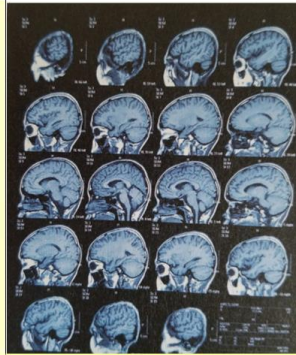
## AI Medical Diagnosis

Edward Shortliffe, born at 1947

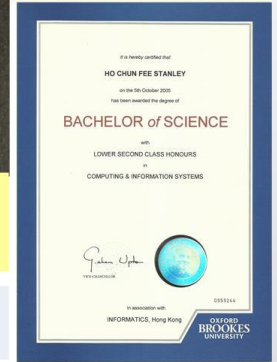
MYCIN is the first expert knowledge system, can use AI to identify serious Bacterial, Meningitis or serious blood-borne infectious disease providing suitable Antibiotics suggestion.

MYCIN has three areas, 1. enquiry, 2. explanation, 3. gain the knowledge.

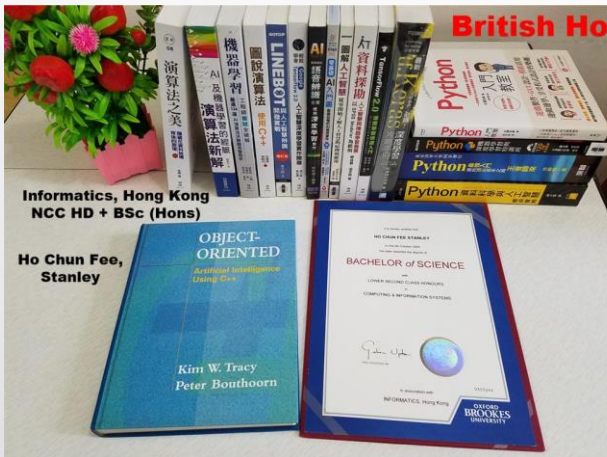
AI medical diagnosis needs large computational resource.



*Oxford*  
Computer Studies



Computer is to service this world, helpful to many environment.



Informatics, Hong Kong  
NCC HD + BSc (Hons)

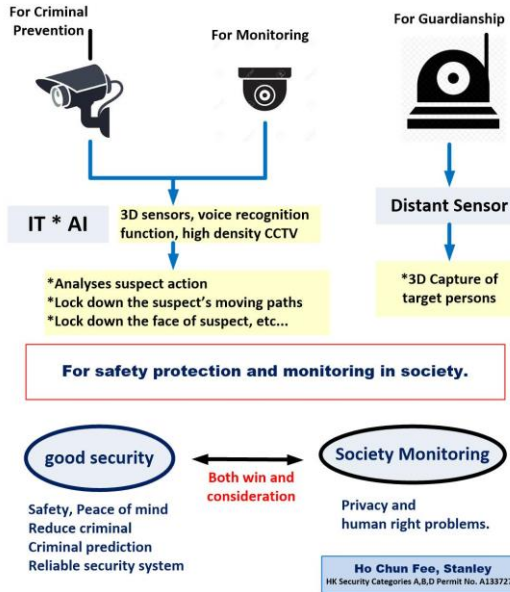
Ho Chun Fee,  
Stanley



C&G Telecom  
Technician T4

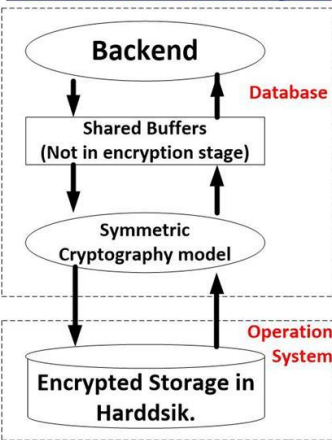
# IT & AI

AI application in Security Systems bring your life safety, criminal prevention, monitoring, and guardianship.



## Cybersecurity – Database Cryptography

### TDE Structure Block Diagram



### Transparent Data Encryption, TDE 透明資料加密

It is used in the database cryptography technique, such as Microsoft SQL Server & Azure SQL, IBM Db2, and Oracle, etc... It keeps Data at Rest information security, the storage files for examples, \*.mdf, \*.ndf, \*.ldf formats.

For example, Microsoft SQL's TDE structure which used AES & 3DES symmetric cryptography algorithm, and the database key is called Data Encryption Key DEK.

**Stanley C. F. Ho**  
 Oxford Computer Studies

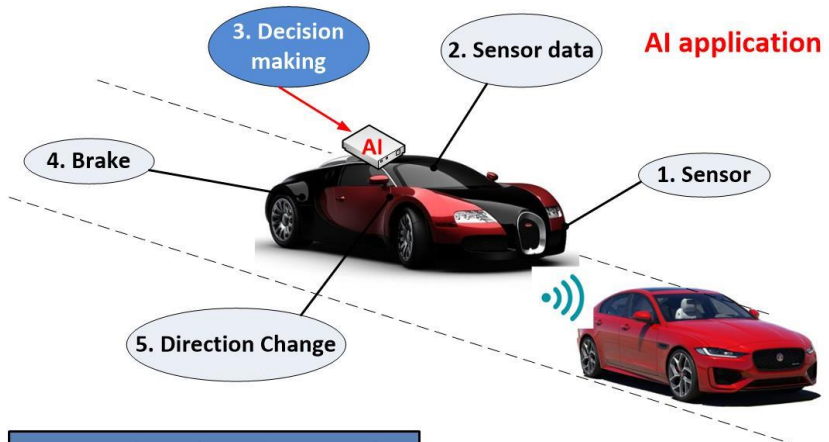
## A.I. Artificial Intelligence Development

### LINE Bot talking machine in smart AI development Azure Cognitive Services

- (1) LINE official site: <https://line.me/zh-hant> or English version: <https://line.me/en-US/>
- (2) Azure cloud services in Microsoft Account: <https://account.microsoft.com/account>
- (3) Azure cloud: <https://visualstudio.microsoft.com/zh-hant/dev-essentials/>  
<https://visualstudio.microsoft.com/zh-hant/free-developer-offers/>
- (4) Development tools Visual Studio, Community version: <https://www.visualstudio.com/zh-hant/downloads/>  
<https://visualstudio.microsoft.com/zh-hant/downloads/>

**Informatics Hong Kong**

**Title: AI driving vehicle autopilot in 3D sensing technique.**



Computer depends on the sensor data for automatic driving.

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**Oxford** Computer Studies






**Autopilot commercialization (自動駕駛的商業化)**

The AI application environment should have more flexible with tolerance, e.g., the cleaning robot meets the obstacle and it will return and will search next paths. Siri voice learning, in case, it learns more times which the voice can be recognized. But for the vehicle driving, in case a man being wrongly recognized as a pillar, that could have a serious problem.

Heathrow Pod (自動駕駛巡迴巴士) has been operated since 2011, passengers can use at London Heathrow Terminal T5 free of charge.





Induct Navia price USD250,000  
Carry 8 persons, speed 20km/h



Navya company's Arma  
Carry 15 persons, speed 45km/h

**Title:**  
**Autopilot using AI**

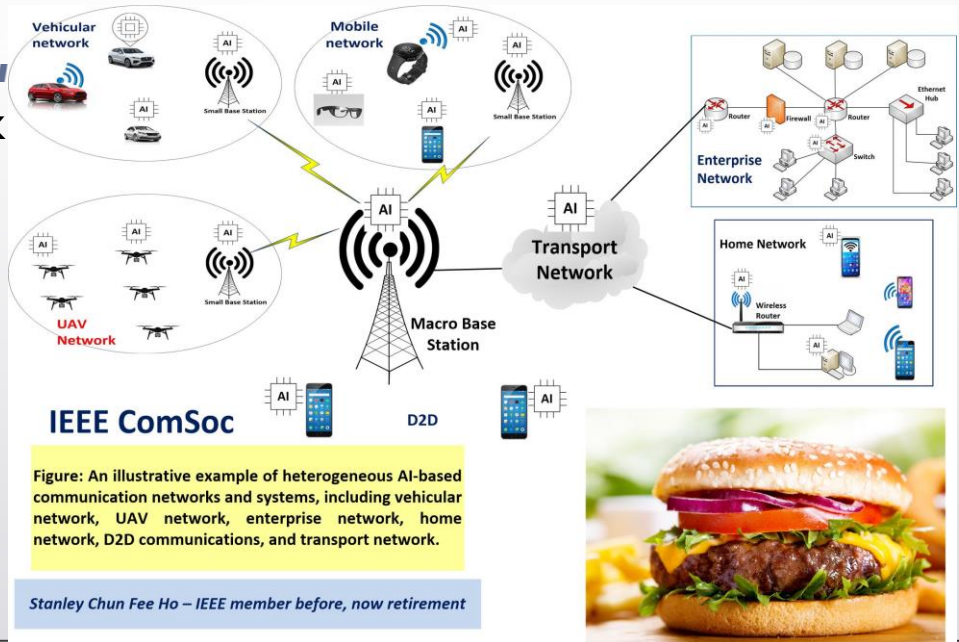
Researched by:  
Ho Chun Fee, Stanley



**UK**  
**Heathrow Pod**



# AI in Network



# Bye! Bye!



**Member of The British Computer Society (HK Section)**

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