



祝國忠 老師  
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Information Management

# 巨量資料決策分析實驗室



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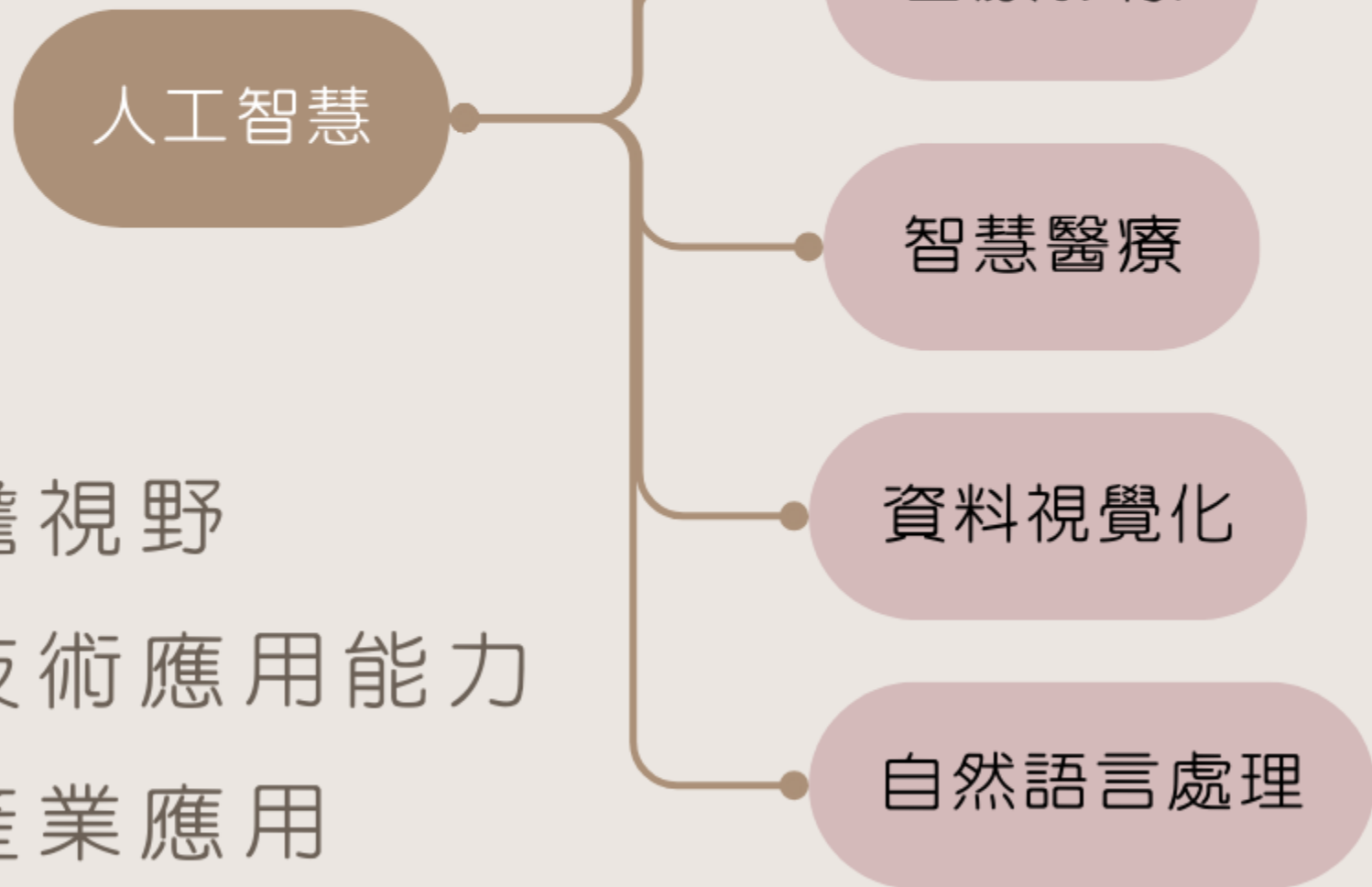
National Taipei University of Nursing and Health Sciences

# 主要研究領域

- 人工智慧與深度學習在醫療影像的應用
- 自然語言處理（NLP）在健康領域的應用
- 健康大數據資料分析與視覺化應用
- 智慧醫療與資訊創新應用

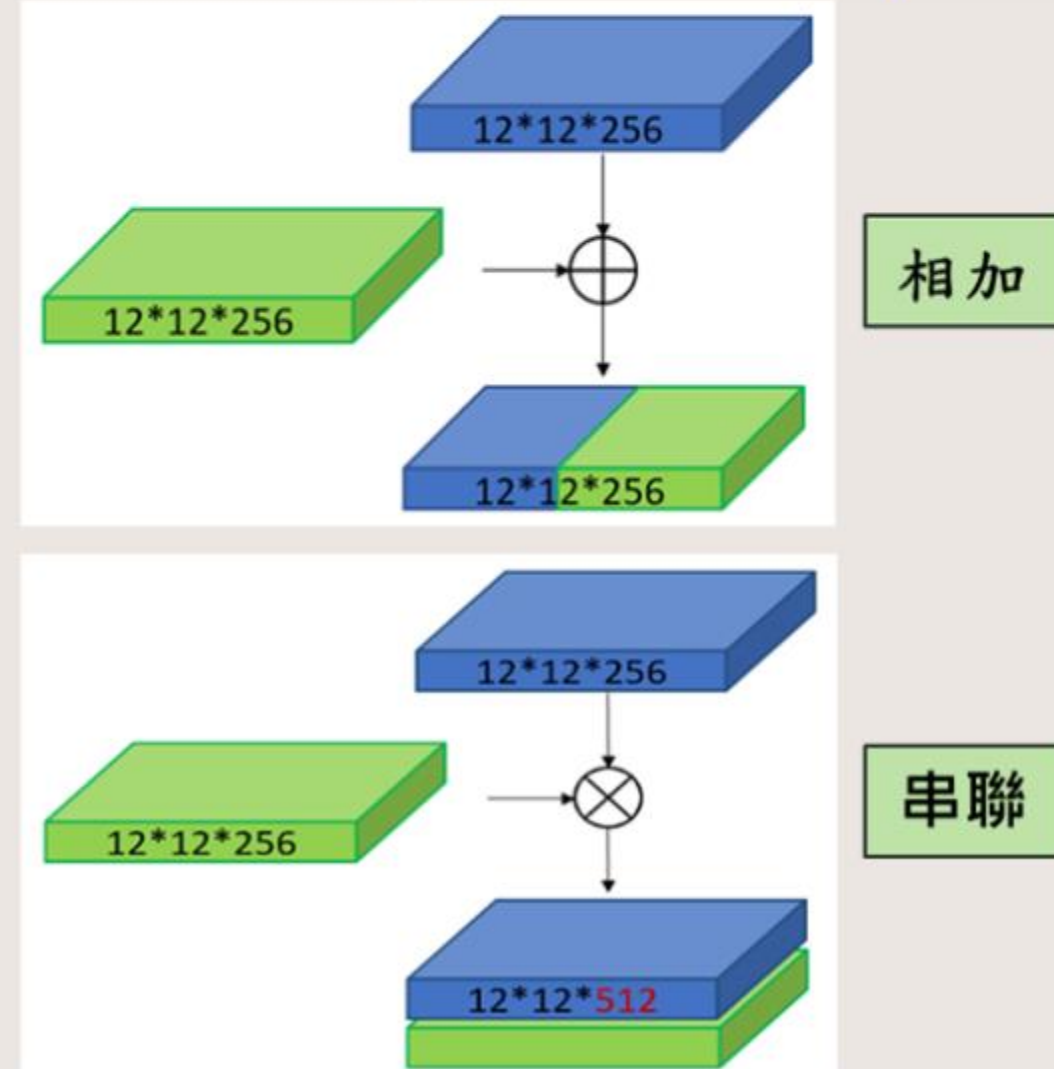
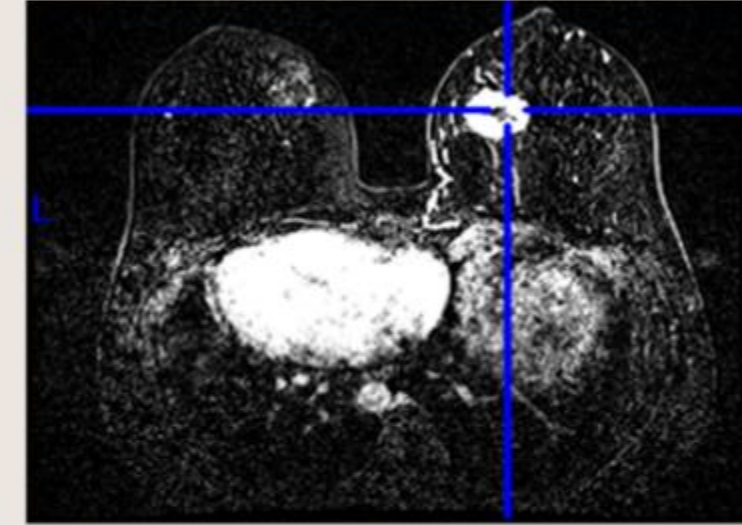
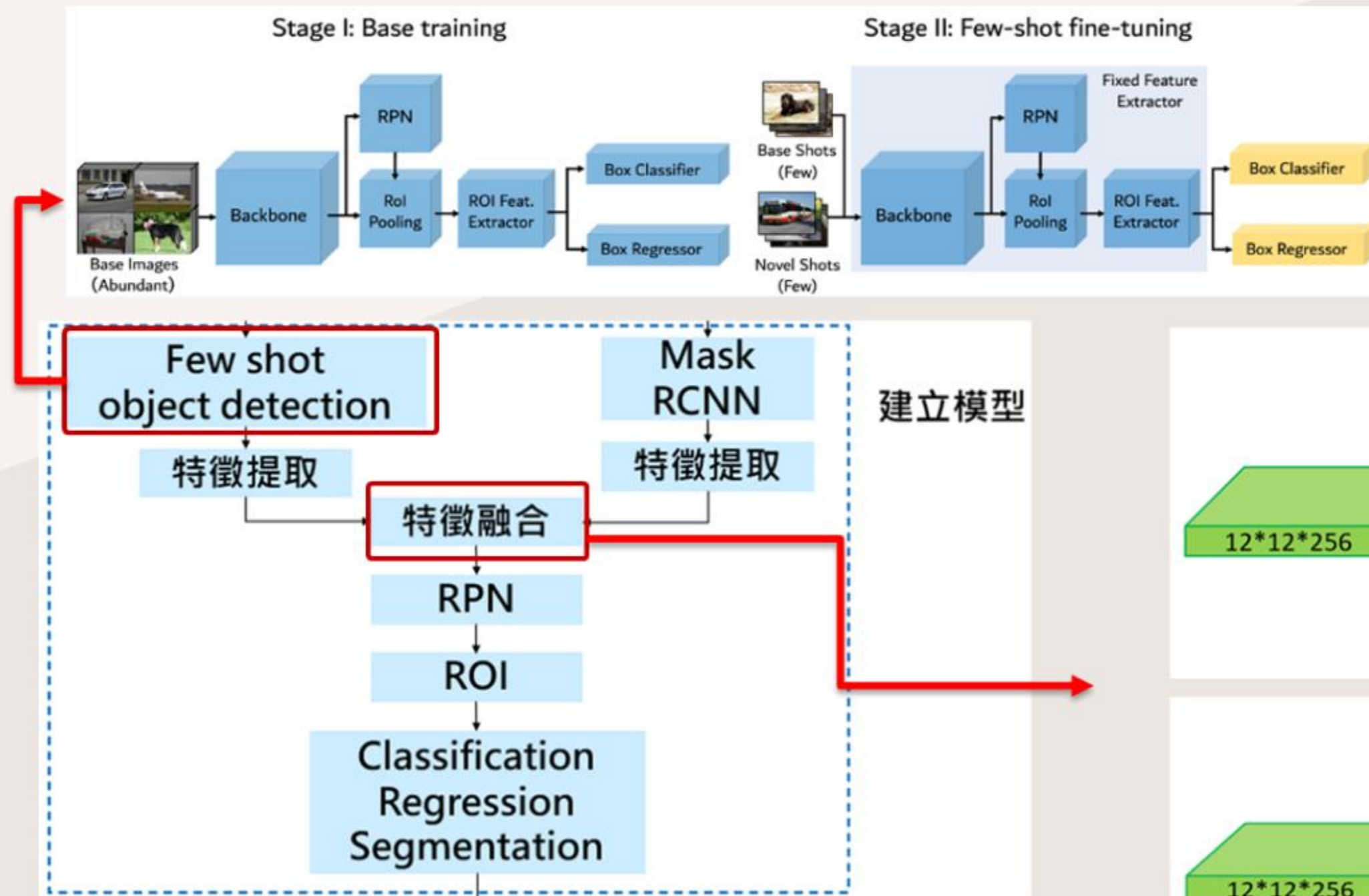
# 培育方針

- 跨領域整合能力
- 創新思維與前瞻視野
- 實踐導向與問題解決
- 培養人工智慧技術應用能力
- 團隊協作與溝通能力
- 深化智慧醫療產業應用



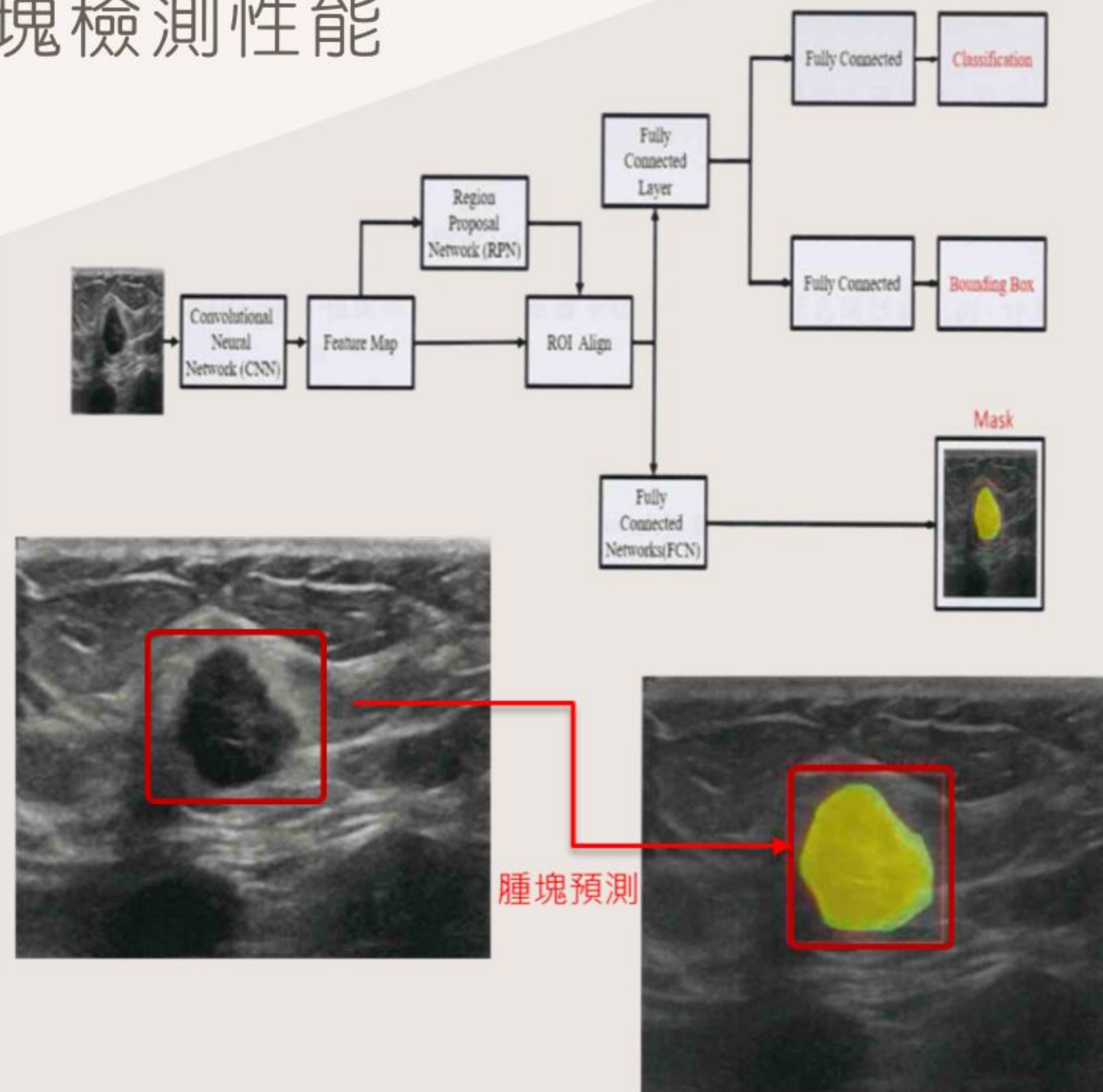
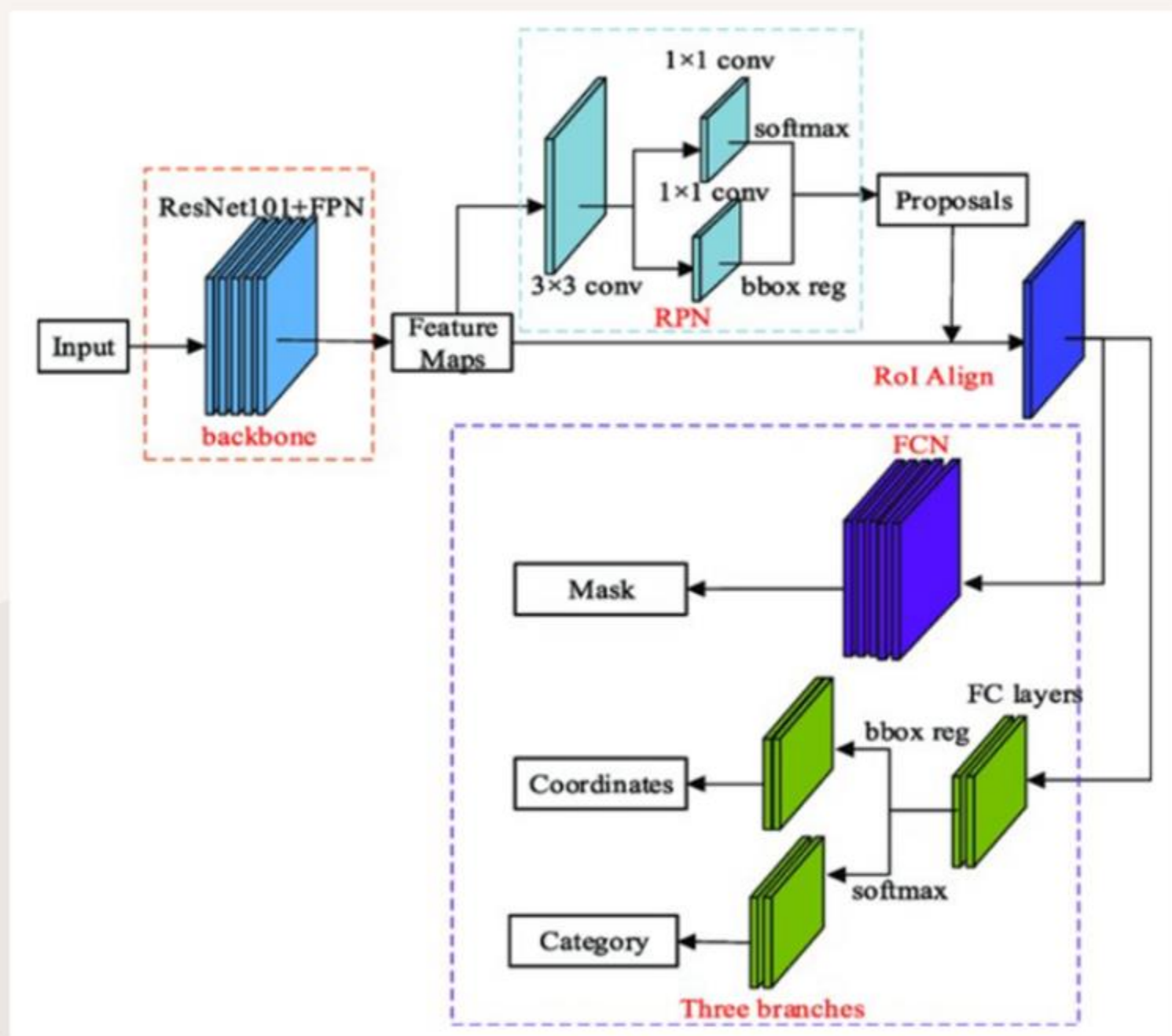
# 深度學習應用在乳房核磁共振影像

特徵融合基於少樣本物件偵測與Mask R-CNN的病灶辨識比較



# 深度學習應用在乳房超音波影像

利用數據增強提升乳房超音波腫塊檢測性能

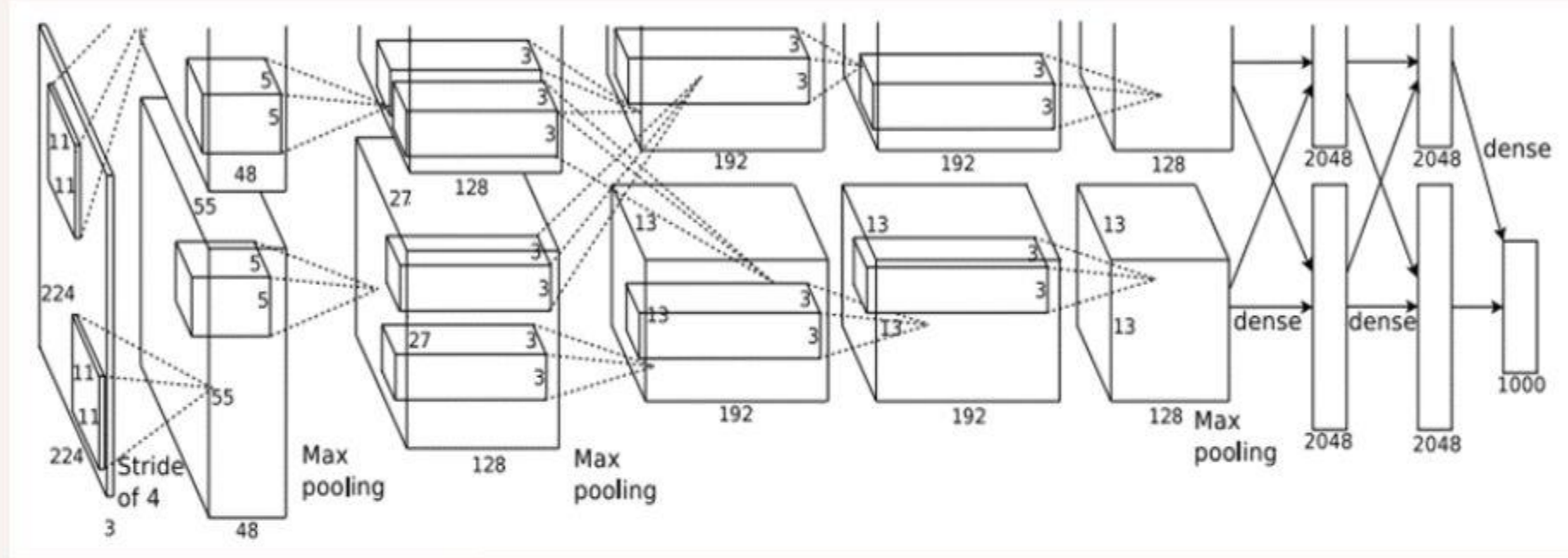
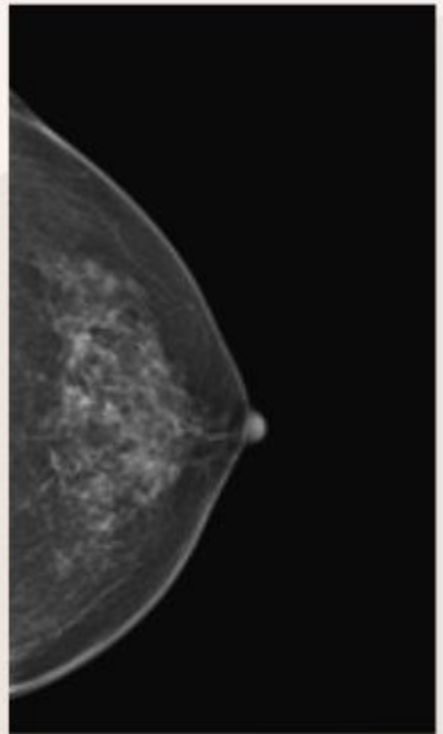


Mask R-CNN網路架構圖

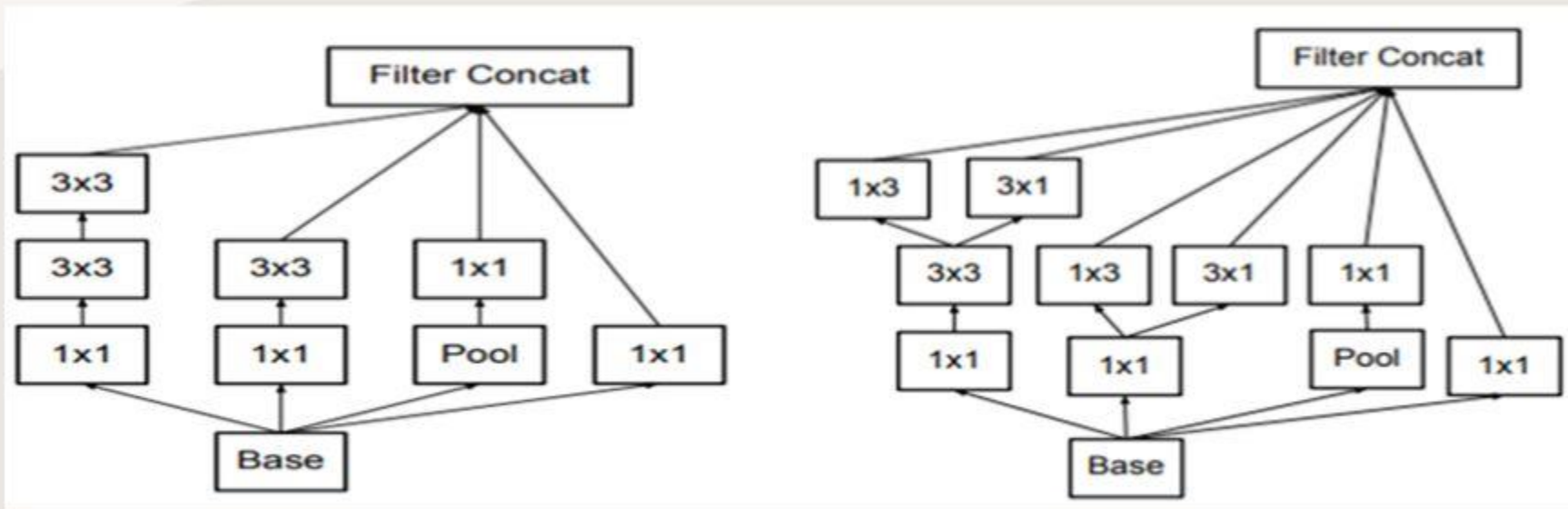


# 深度學習應用在乳房攝影影像

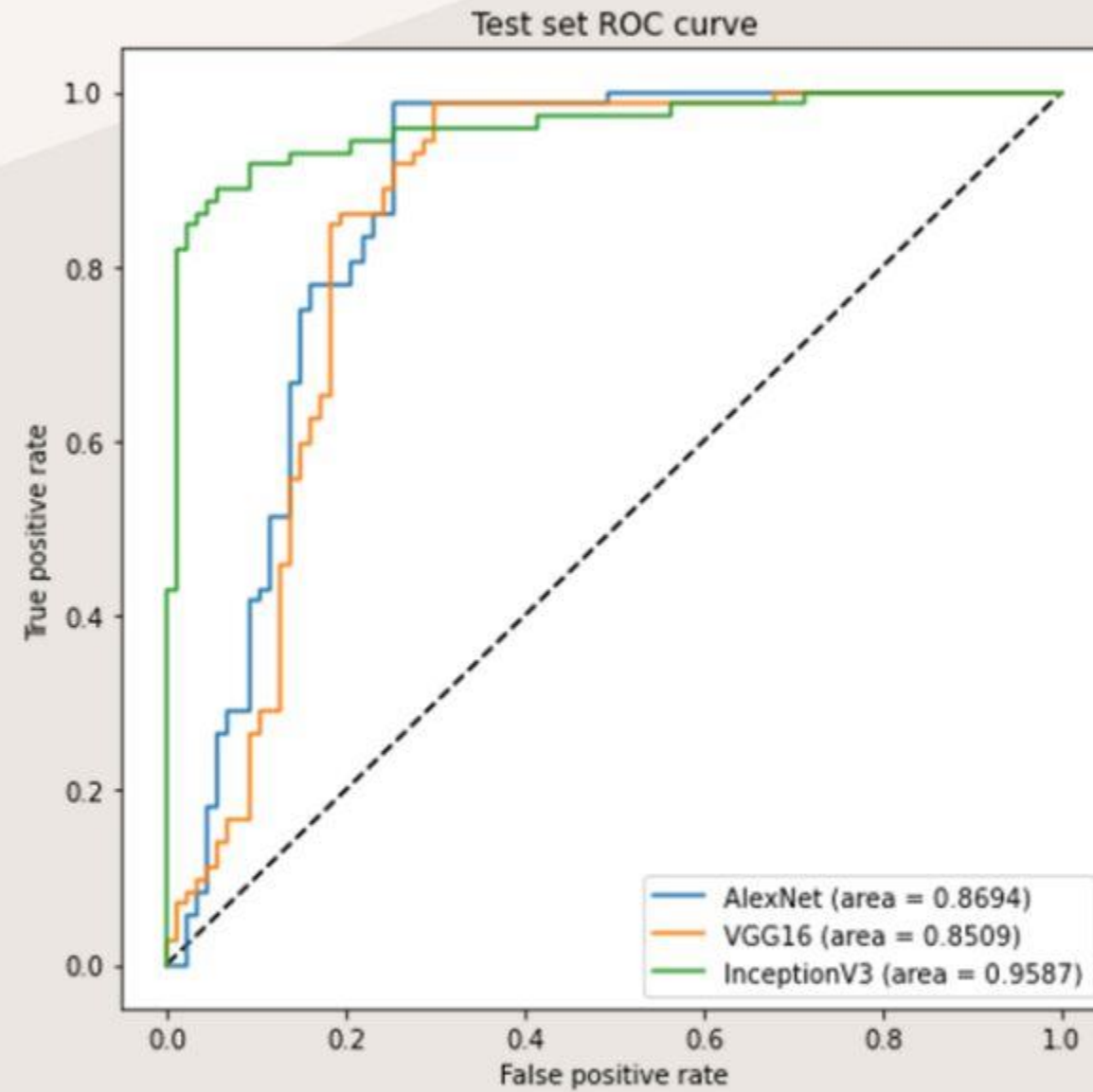
## 基於深度學習法建立乳房攝影BI-RADS分類模型



AlexNet架構圖



Inception v2與v3的網路結構



Model	Accurac y	Sensitivit y	Specificit y	Precision	F1 Score
Alexnet	0.7987	0.8611	0.7471	0.7381	0.7949
VGG-16	0.8301	0.9861	0.7011	0.7320	0.8403
Inception v3	0.9056	0.8056	0.9885	0.9831	0.8855 <b>5</b>

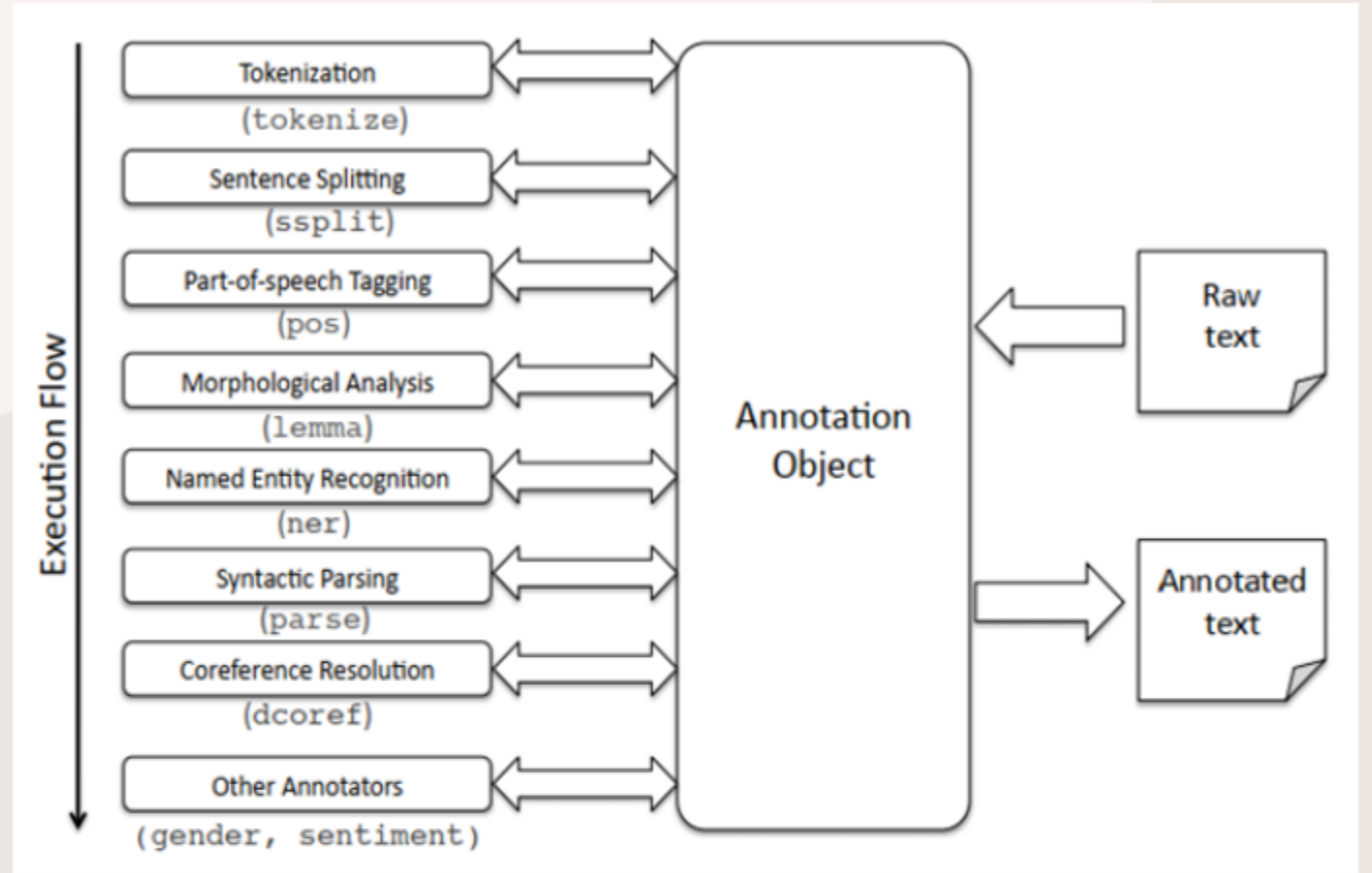
# 自然語言處理應用在病歷醫囑

## 乳癌病變醫囑結構化探討

S:Skin lesion over feet for months; several skin lesion on feet was also complained of.  
O:Scaling papular lesion and patches on toes and soles of feet; three verrucous skin lesion on heels of feet.  
A:1.Eczema, feet.  
2.Verruca, heels of feet.  
P:1.Topical medicine.  
2.Cryotherapy.

### SOAP範例

```
乳癌病變醫囑結構化探討
 POS  RegexNER  TokensRegex 
cT1cN1M0,pT1cN1aM0, ER 80% (+), PR 2% (+),Her2/neu (0, IHC)
cT1cN1M0 [pos=NN; ner=O; lemma=ct1cn1m0]
, [pos=,; ner=O; lemma=,]
pT1cN1aM0 [pos=NN; ner=O; lemma=pt1cn1am0]
, [pos=,; ner=O; lemma=,]
ER [pos=NN; ner=O; lemma=er]
80 [pos=CD; ner=O; lemma=80]
% [pos=NN; ner=O; lemma=%]
-LRB- [pos=-LRB-; ner=O; lemma=-lrb-]
+ [pos=CC; ner=O; lemma=+]
-RRB- [pos=-RRB-; ner=O; lemma=-rrb-]
, [pos=,; ner=O; lemma=,]
PR [pos=NN; ner=O; lemma=pr]
2 [pos=CD; ner=O; lemma=2]
% [pos=NN; ner=O; lemma=%]
-LRB- [pos=-LRB-; ner=O; lemma=-lrb-]
+ [pos=CC; ner=O; lemma=+]
-RRB- [pos=-RRB-; ner=O; lemma=-rrb-]
, [pos=,; ner=O; lemma=,]
Her2/neu [pos=NN; ner=O; lemma=her2/neu]
-LRB- [pos=-LRB-; ner=O; lemma=-lrb-]
0 [pos=CD; ner=O; lemma=0]
, [pos=,; ner=O; lemma=,]
IHC [pos=NNP; ner=ORGANIZATION; lemma=IHC]
-RRB- [pos=-RRB-; ner=O; lemma=-rrb-]
toolStripStatusLabel1 2020/07/24 23:26:19
```

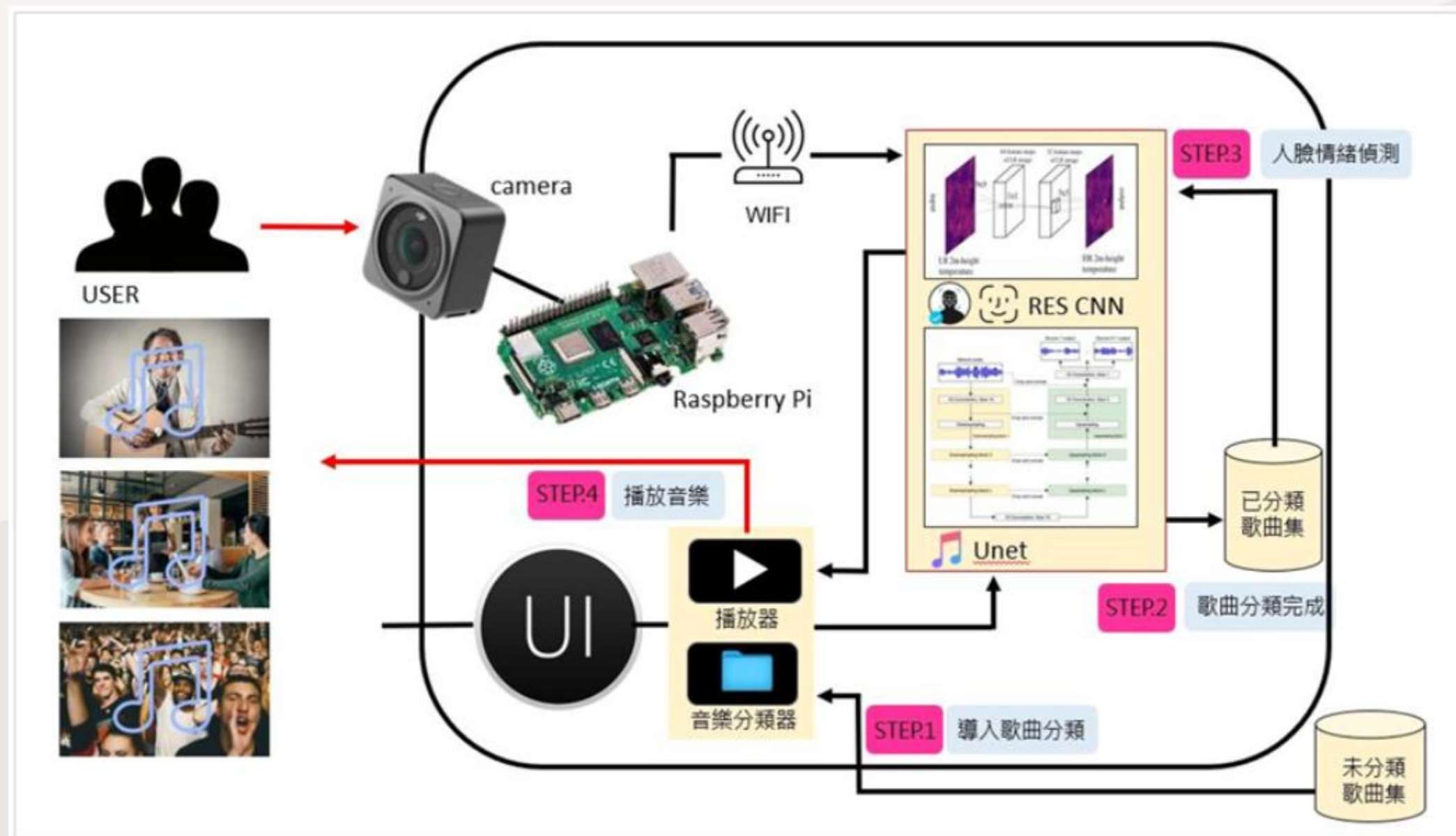


### Stanford CoreNLP

```
乳癌病變醫囑結構化探討
 POS  RegexNER  TokensRegex 
cT1cN1M0,pT1cN1aM0, ER < 80% (+), PR > 2% (+), Her2/neu (0, IHC)
cT 1c
cN 1
cM 0
pT 1c
pN 1a
pM 0
ER <80 +
PR >2 +
Her2/neu 0,IHC
```

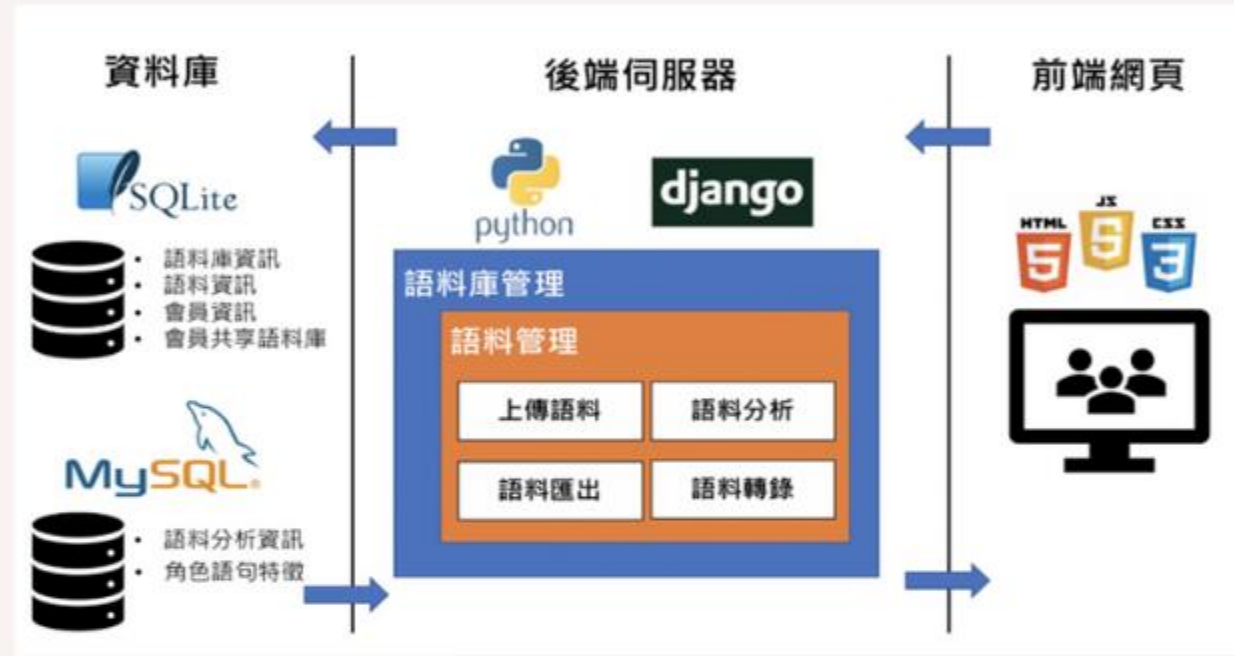
# 深度學習應用於情緒識別

## 應用人臉情緒分析技術建置音樂播放系統



# 自然語言處理應用於兒童語言

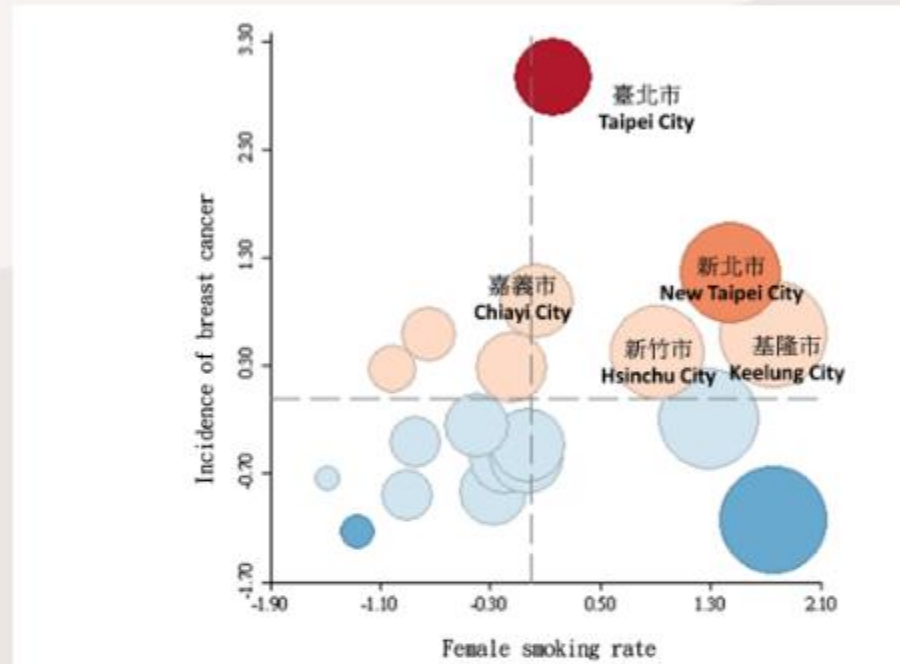
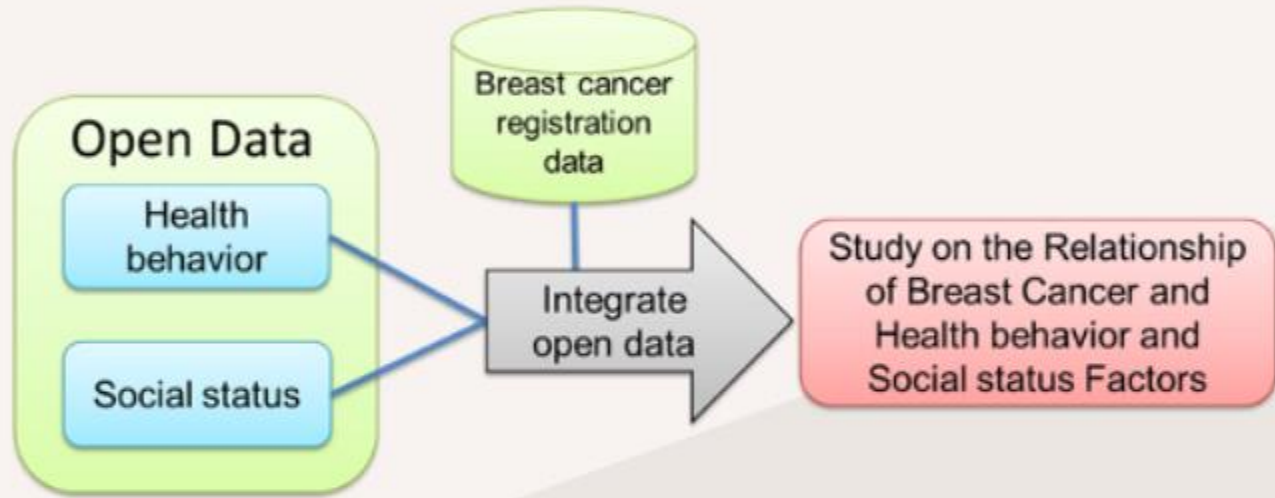
## 華語兒童語言樣本分析與視覺化系統建置



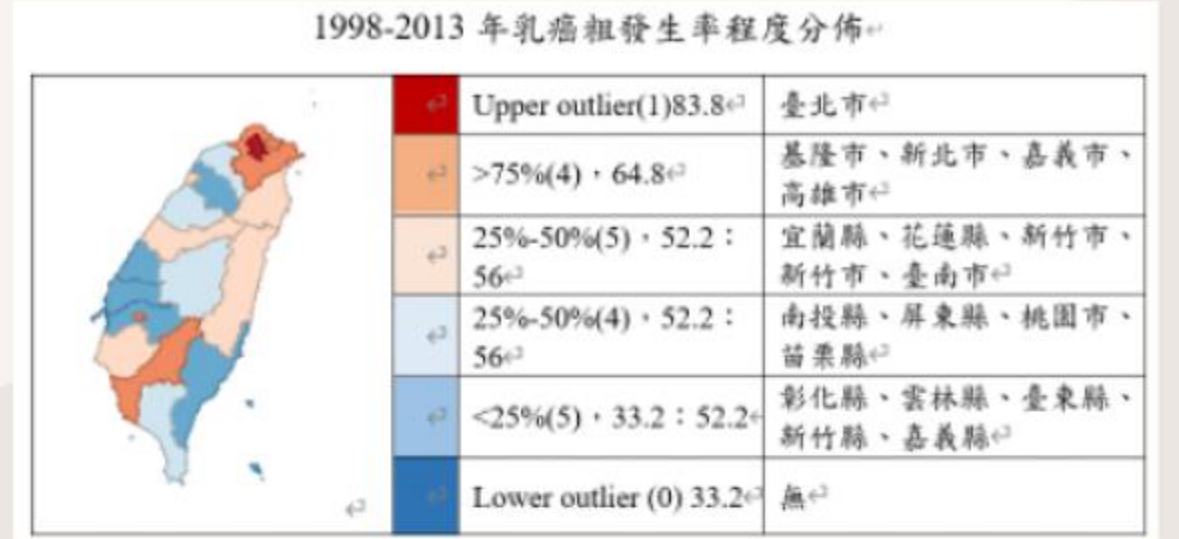


# 開放資料大數據分析與資料視覺化

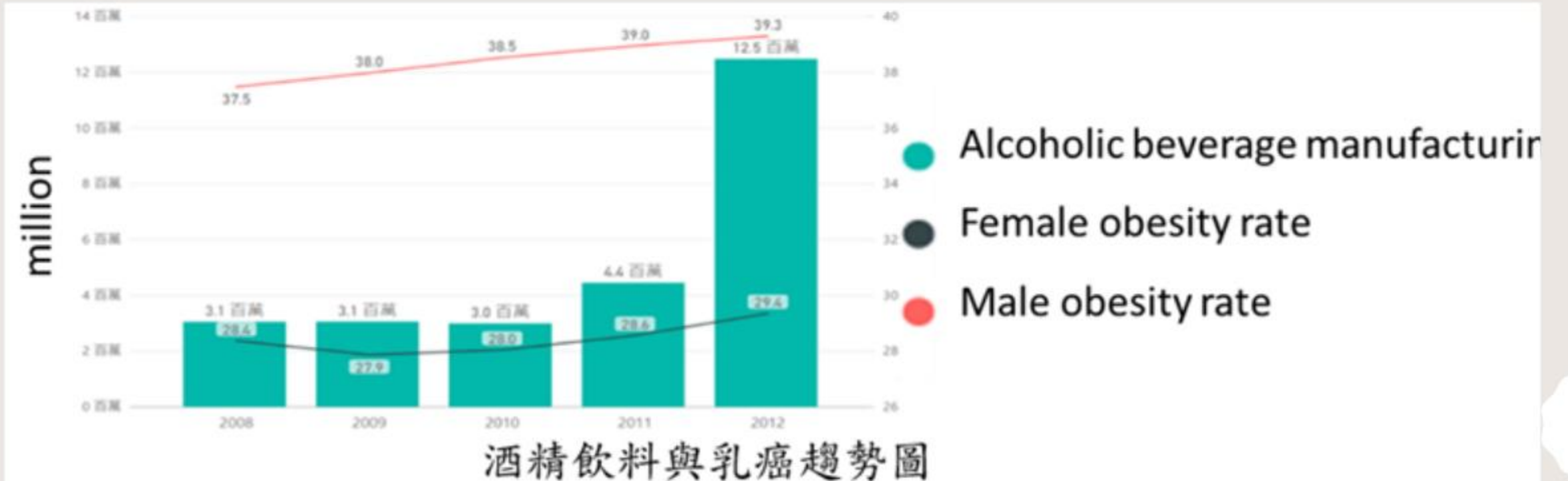
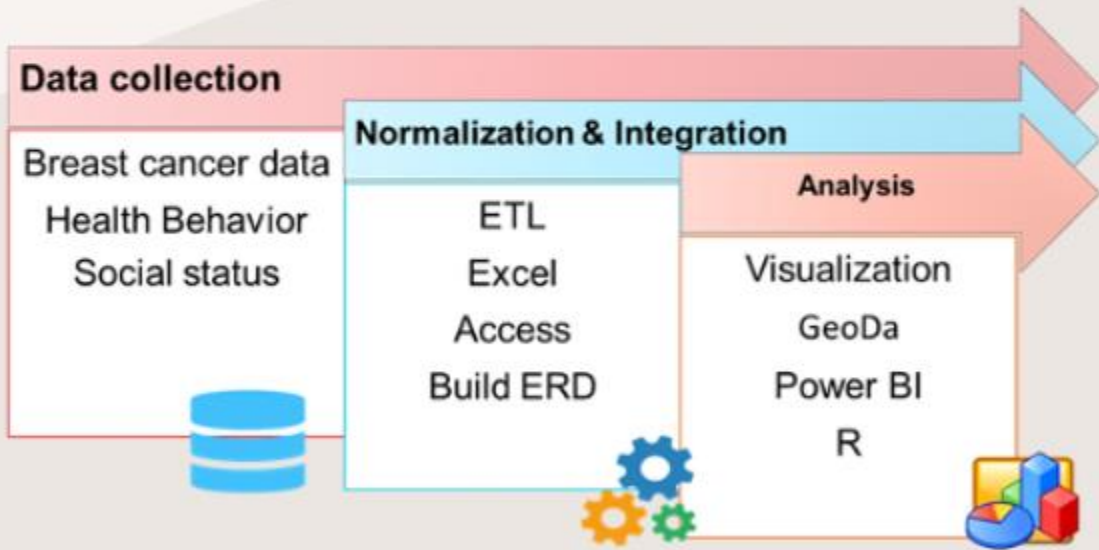
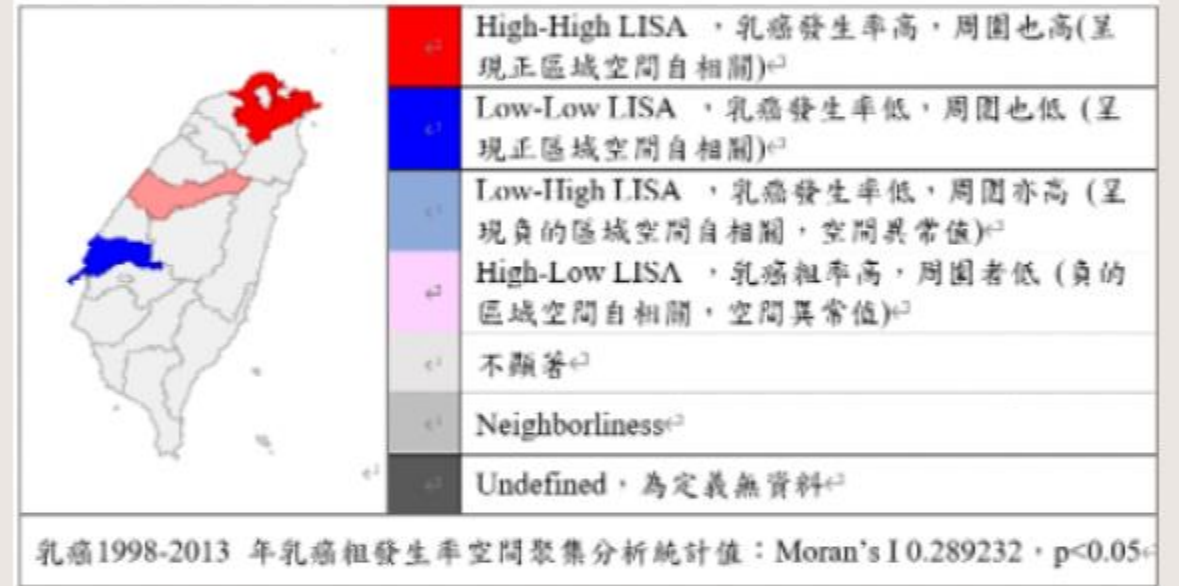
## 乳癌與空氣污染開放資料分析與視覺化呈現



2004-2007 女性吸菸率與乳癌粗發生率分佈象限圖



1998-2013 年乳癌粗發生率 LISA Significance Map



# 學生參加國內/國外研討會發表論文與競賽得獎

- 112年
  - IEEE: Building and Validating a Clinical Ultrasound Image Reporting Model
- 111年
  - APAMI: Machine Learning Approach for Chronic Kidney Disease Risk Prediction Combining Conventional Risk Factors and Novel Metabolic Indices
  - 第八屆德明盃全國技專校院行動商務創意競賽：住宅守門員（總決賽亞軍、決賽特優）
- 110年
  - IEEE: Prediction Model of Social Network Suicide Ideation by Small Sample
- 109年
  - IEEE: Modeling of Clinical Mammography Recognition