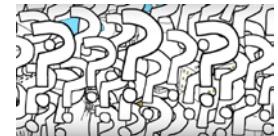


AI + Gerontechnology (人工智慧與福祉科技) 大學社會責任（University Social Responsibility,USR）實踐計畫

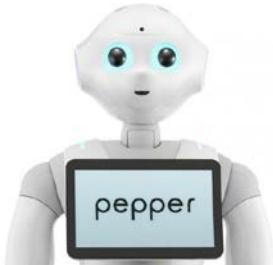


報告人：淡江大學 人工智慧學系 鄧有光
兼 精準健康學院 高齡健康管理學研究所所長
兼 蘭陽校園行政長
114722@mail.tku.edu.tw

大家認為AI是 AGI(Artificial General Intelligence)
其實是ANI([Artificial Narrow Intelligence](#))



- Gerontology + Technology = Gerontechnology
 - MIT AgeLab - HEALTH CONCERNS AND THE OLDER DRIVER, Pilot Assist
 - Japanese research institute Riken- Robear2.0
 - Nanyang Technological University-Nadine
 - PARO: Therapeutic robot baby seal for people with dementia



AI (Artificial Intelligence)是什麼？

- 大家以為AI是 AGI (Artificial General Intelligence)
- 其實是ANI (Artificial Narrow Intelligence)

以Healthcare為例：

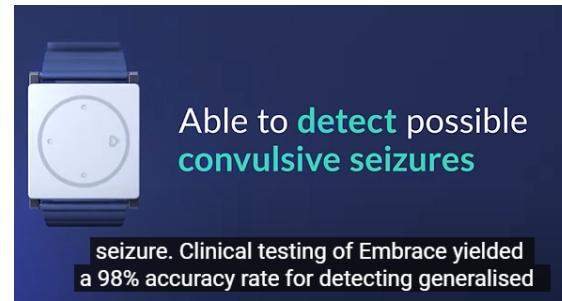
- 心律分析



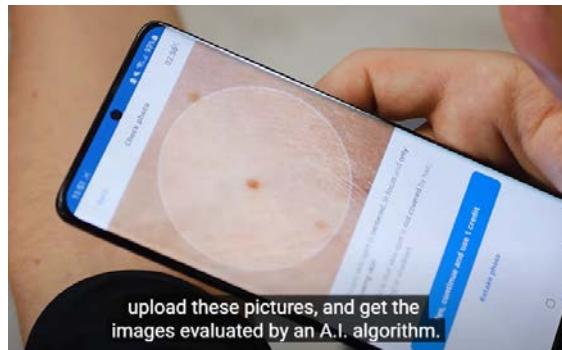
- 敗血症分析



- 突發癲癇預測
(Tonic-clonic seizure)

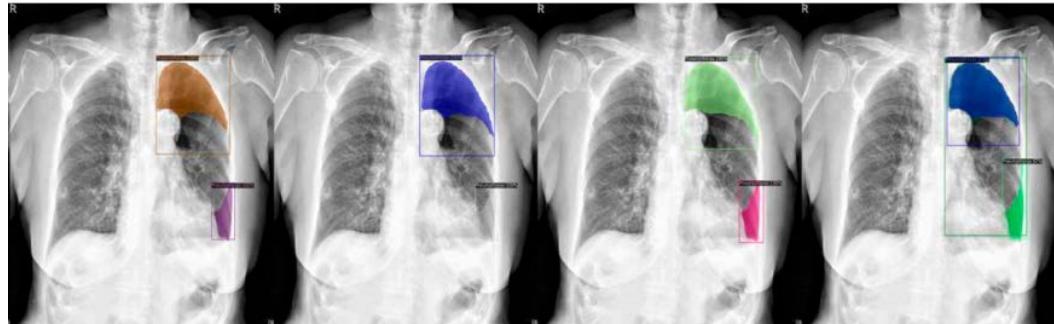


- 皮膚病變檢測
(Skin lesions)
- 中風影像偵測
Stroke CT images



肺部疾病檢測 Chest Disease Detection (MaskRCNN)

2023.09



False Positive (%)	False Negative (%)	Accuracy (%)	AP (%)	AP50 (%)	AP75 (%)
1.33	4.38	94.29	48.76	80.34	53.35
1.09	3.68	95.23	46.82	76.61	50.46
0.88	3.44	95.68	44.61	78.95	49.20
1.47	5.91	92.62	49.26	84.20	53.45
1.12	4.99	93.89	51.57	79.46	61.40
1.05	3.40	95.55	49.50	82.20	50.79

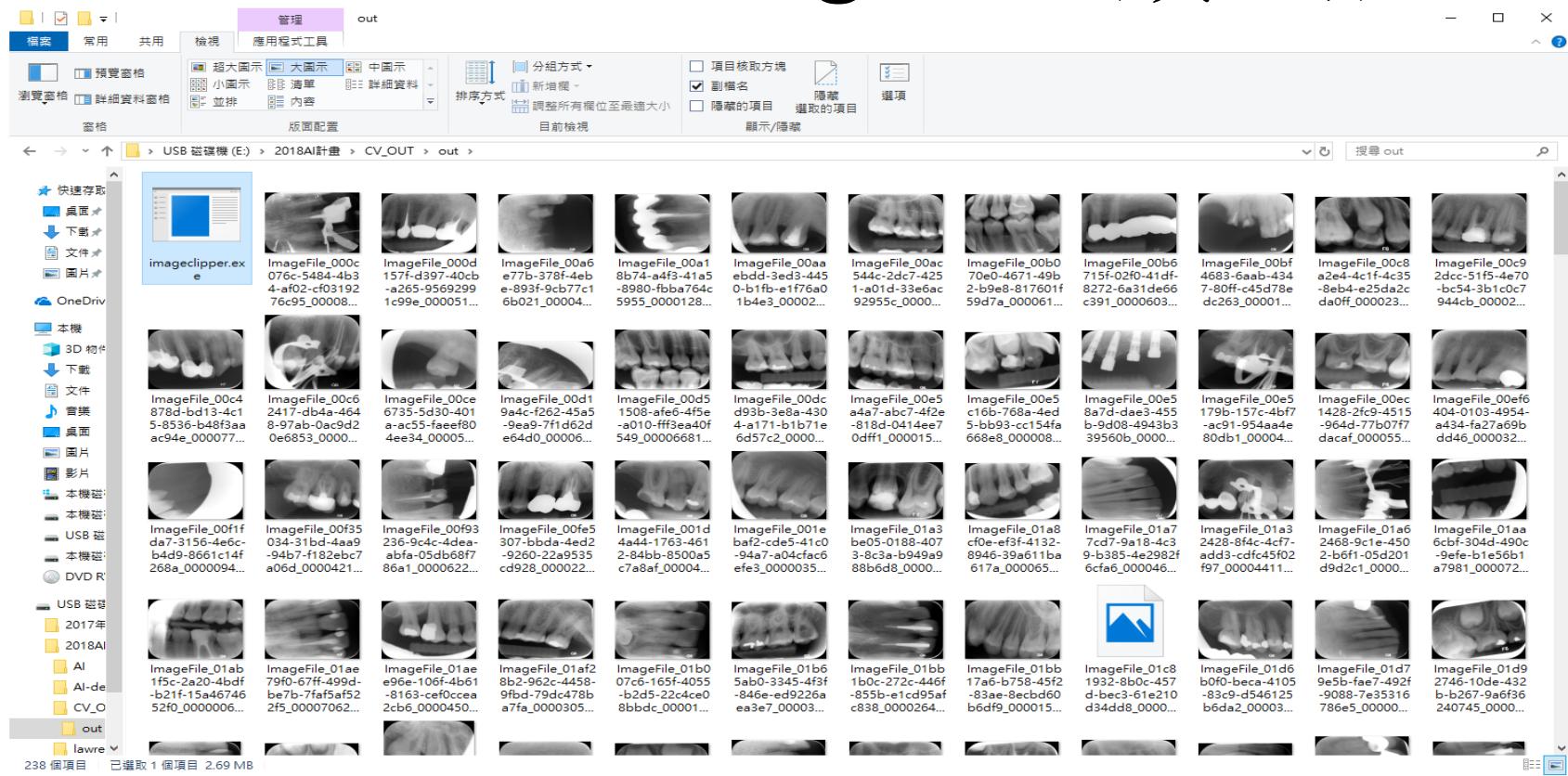


Article

Application of Deep Learning Techniques for Detection of Pneumothorax in Chest Radiographs

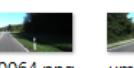
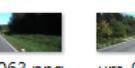
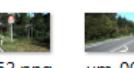
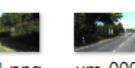
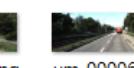
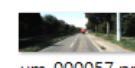
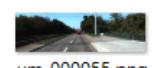
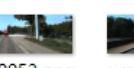
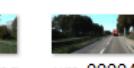
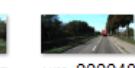
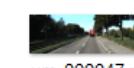
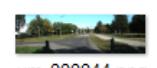
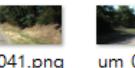
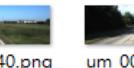
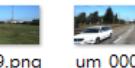
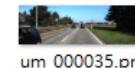
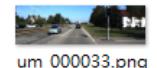
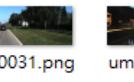
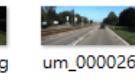
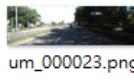
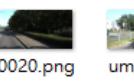
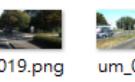
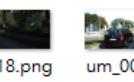
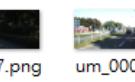
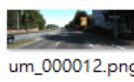
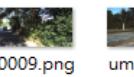
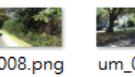
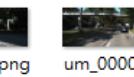
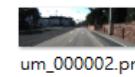
Lawrence Y. Deng ¹, Xiang-Yann Lim ², Tang-Yun Luo ³, Ming-Hsun Lee ^{4,*} and Tzu-Ching Lin ²

Artificial Intelligence(實例)



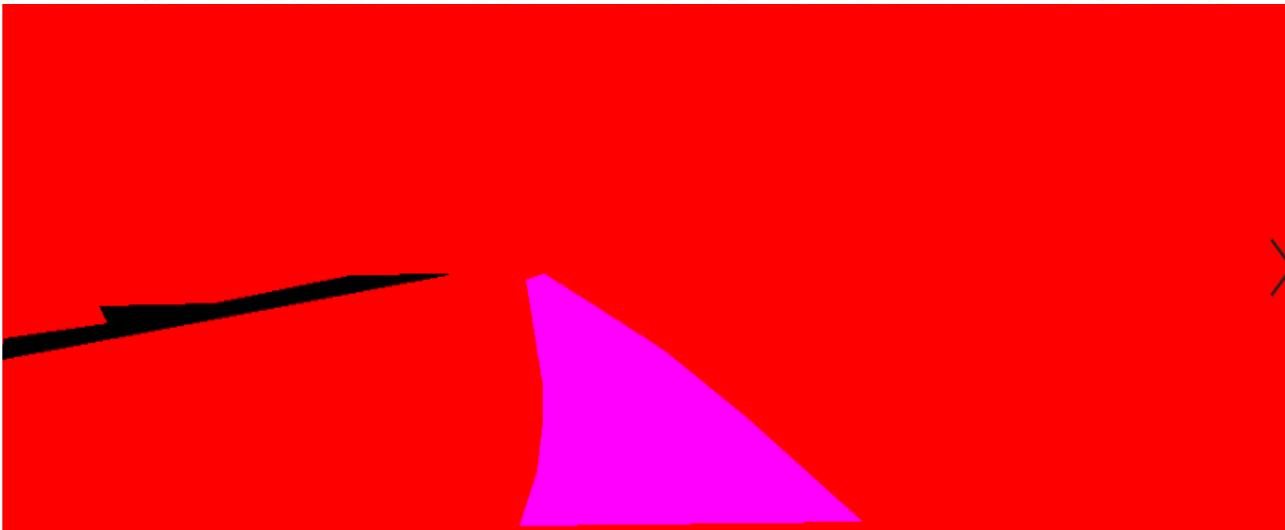
1. 超過1,000,000張，每張3~8顆牙；目標：協助醫生好壞牙齒分類
2. 假裝你是牙醫，並Chopping每顆牙分類之…
3. 正規化大小
4. Training?

Artificial Intelligence(實例)





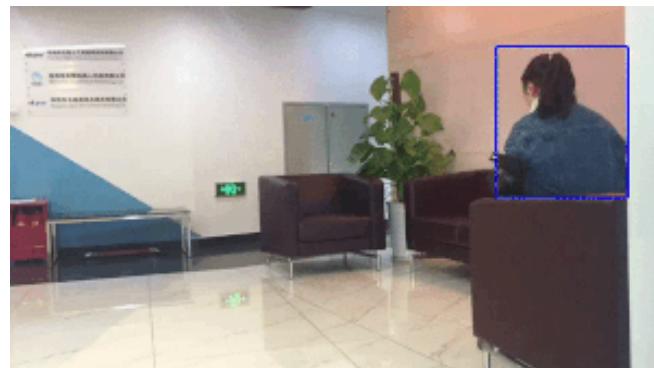
看到鄧哥的車來了！趕快閃！



銀髮產業 商機無限

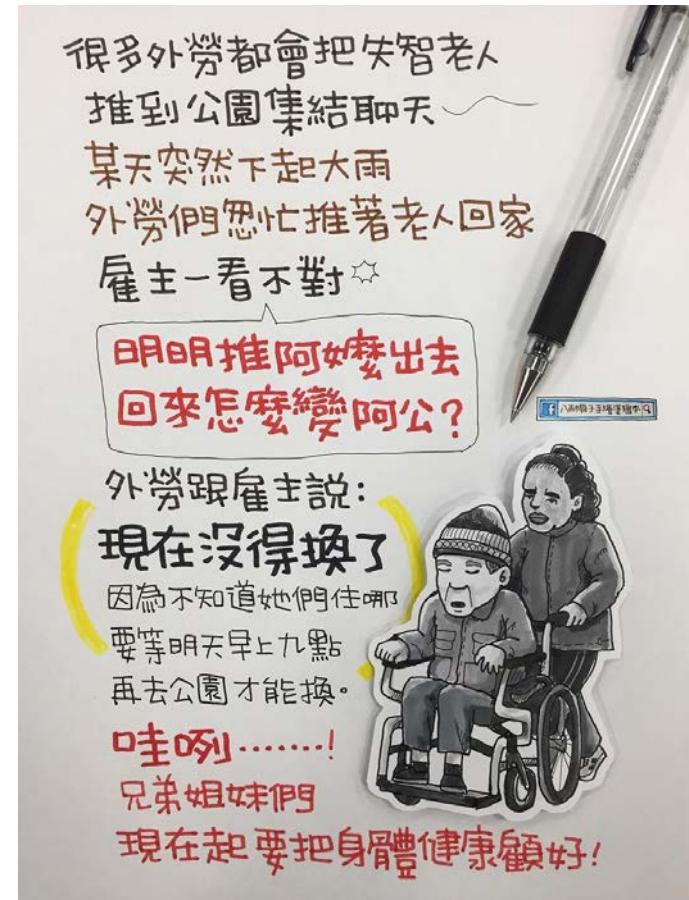


- 2019~2030日本失智症患者估持有215兆日元（約12兆人民幣）
- 美國人口統計局2016年資料，55歲以上的人持有80%的金融資產，美國55歲以上族群每一家戶年消費金額約8.3萬美金



● 相關生育率列表 (美國中情局2017資料)

排名	國家或地區	出生率
55	菲律賓	3.02
→ 105	印尼	2.11
	世代更替水平	2.10
143	美國	1.87
→ 149	越南	1.81
182	中華人民共和國	1.60
194	泰國	1.52
209	日本	1.41
224	新加坡	0.83



傳統靠較低成本人力來支援老人照護事業？未來不可行！
近3年東南亞也正在快速地少子化！！

精準健康學院

未來發展計畫：智慧精準健康剖面



健康福祉-產業創新

領域	次領域
健康促進產品 / 養生福祉產品	運動健身器材業
	運動健身穿戴裝置
	壓力檢測/舒眠用品
	健康餐食/養生餐食/特殊營養品
	輔助器材業

- 食(37%) - 健康食品、營養補助食品、機能性食品、泥狀食品、高齡者飲食(餐廳)、送餐服務
- 衣(3.7%) - 介護衣料、抗菌毛料、醫用耗材與紙製品、機能性素材
- 住(25.2%) - 無障礙空間規劃與施工、改建建材設備與工程、設備修繕與維持、保健設施
- 行(14.9%) - 助行器、輪椅(電)、電代步車、福祉車移動裝置、電梯、握把
- 育樂健康管理(19.2%) - 壯世代教育、旅遊規劃、養生娛樂、保健器具與服務

健康福祉產業創新

- 食(37%) - 健康食品、營養補助食品、機能性食品、泥狀食品、高齡者飲食(餐廳)、送餐服務



經營管理智慧化(實證數據化)

AI
式

+
進食
生理
就醫
紀錄

= 創新狀世代餐飲模

健康福祉產業創新

- 衣(3.7%) - 介護衣料、抗菌毛料、醫用耗材與紙製品、機能性素材



經營管理智慧化(實證數據)

AI +

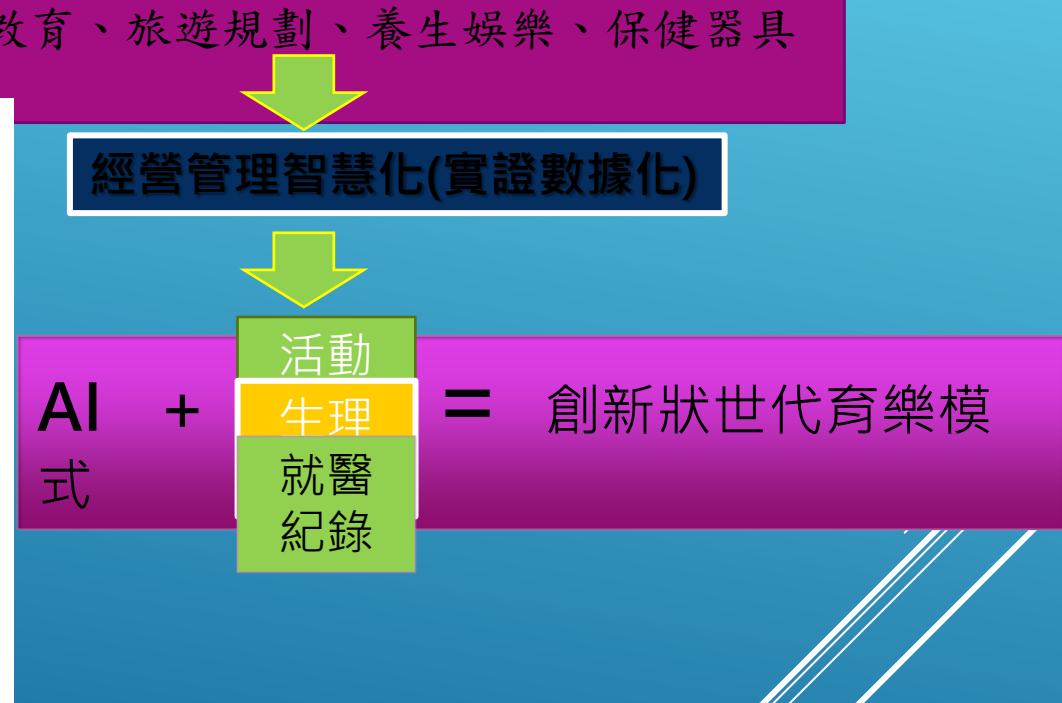
皮膚關
節肌力
生理資
就醫紀
錄

= 創新狀世代穿戴模式



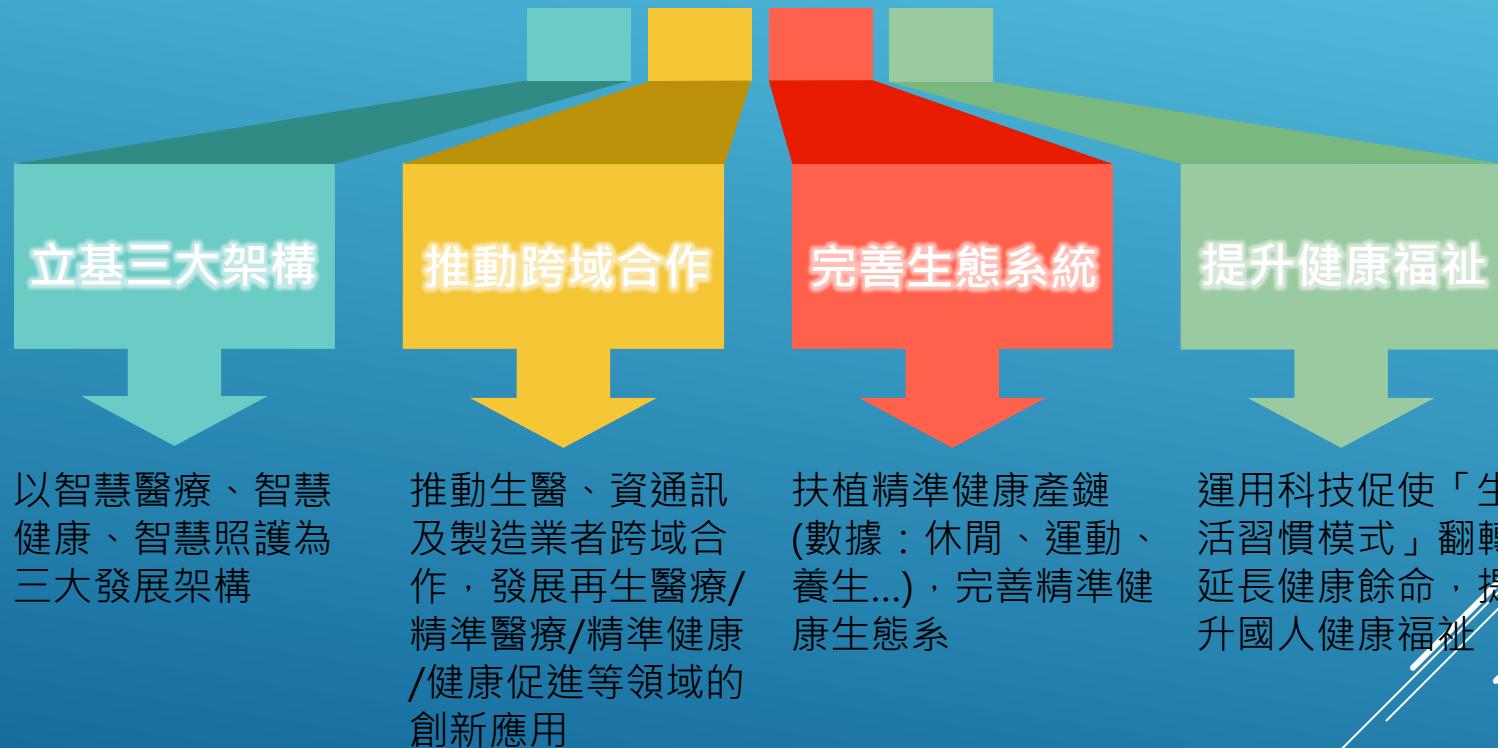
健康福祉產業創新

- 育樂健康管理(19.2%) - 壯世代教育、旅遊規劃、養生娛樂、保健器具與服務



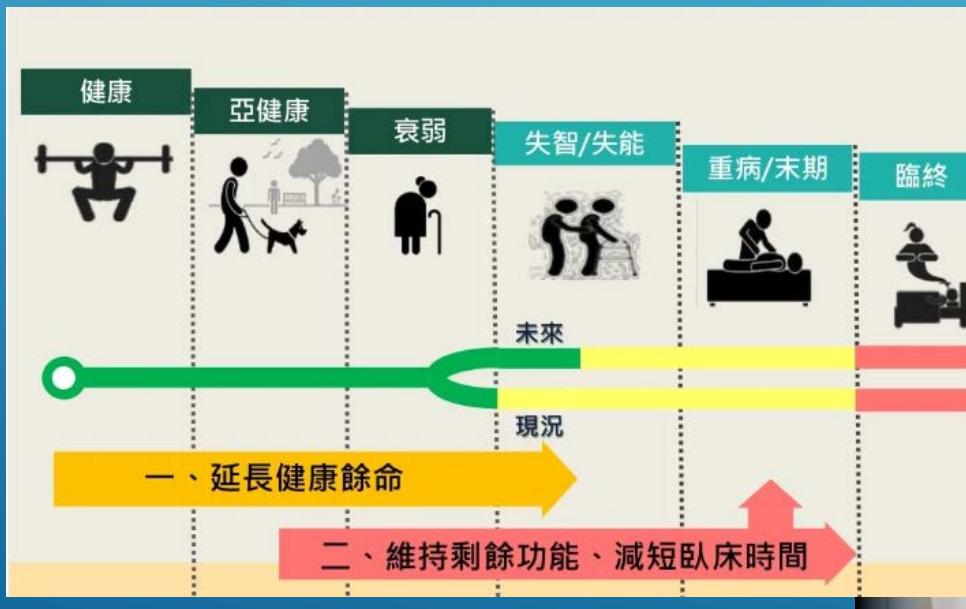
精準健康產業發展與政策

高齡化社會下，未來必須實施“精準健康”的策略



精準健康產業發展與政策 從「長照」到「不長照、少長照」

- 預估到2025年全球精準健康市場規模可達5,847億美元
- 推動「精準健康戰略產業發展方案」
- 藉由成熟智慧科技，推動全齡精準健康，
平均臥床8年(2021)->理想2週(?)



感謝您今天的參與

願營造資訊桃花源夢—逐夢踏實



心得分享

- 沒有一種工作是不用委屈的，辛勞才有成果
- 事情很多做不完，是因為你有價值
- 被抱怨是一種能力
- 常保有學習力、領悟力，就是最好的競爭力
- 經歷艱難，記住美好

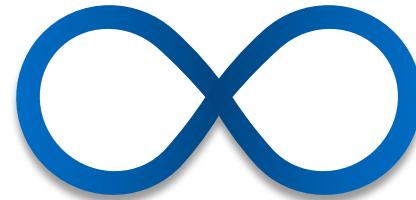




College of Precision Healthcare

AI

SDGs



Prevention/Predictive
Personalized/Participatory

Healthcare

3, 4, 10, 11, 17

OURs Sustainable Vision



**Fit the smart
healthcare market
Cooperate with local
medical institutions**

**Compatible with the University's
B track transformation**

**Comply with national
industrial development**



Lanyang Campus Transformation/Lowest-Low Fertility Rates (Population Aging: Precision Health + Long-term Care Institution)





College of Precision Healthcare

Graduated
Programs
2024

3
Senior Health
Care

Divisions
Intelligent
Management

Precision Healthcare

Cultivate students' ability for Intelligent analysis and apply it to the **quality of health care in industry management**, so that students have the ability to have industry professional and analytical vision, use tools to conduct intelligent analysis, and develop innovative and feasible services or business models

Intelligent Care
Industry

20
24

Intelligent Healthcare

Gerontechnology

Cultivate students' ability to build and analyze health databases, and combine various **professional/personalized knowledge** to interpret the results, so as to be able to design, optimize and implement **health promotion programs**

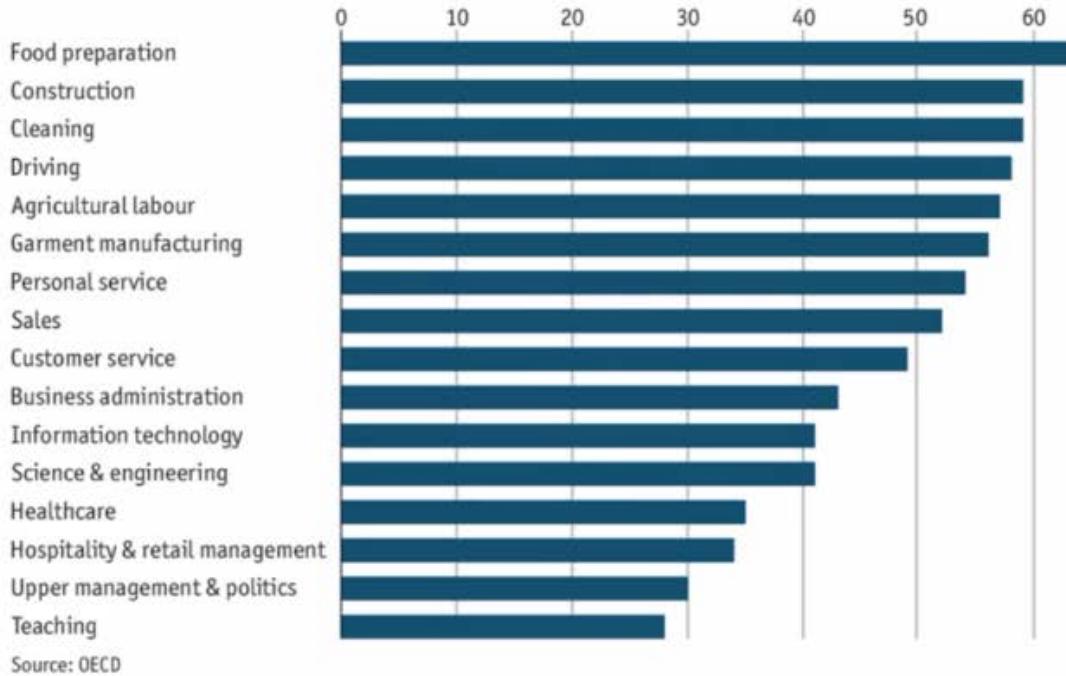
Cultivate students' ability to comprehensive the care process for the elderly group, and have the literacy for the management of the elderly care industry. And be able to use different **AI tools and industry expertise to meet the needs of development and management strategies**

It will focus on the development of the field of smart **Gerontechnology design required by Senior**, and also develop safety environment based on cloud technology. At the same time, integrate health-related data for analysis to improve the **quality of assistive technology**

AI's impact on jobs worldwide

Automated for the people

Automation risk by job type, %



[Image credit: Economist.com]

[Nedelkoska, L. and G. Quintini (2018). Automation, skills use and training. *OECD Social, Employment and Migration Working Papers*, No. 202.]