



人工智慧與網路組


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Main Research

- (1) 電腦通訊網路架構
- (2) 網路流量控制
- (3) 多媒體系統等
- (4) 新的網路技術與傳統網路的結合
- (5) 無線網路的架構

Main Research:

- (1) 5G's three major use cases
- (2) Enhanced Mobile Broadband
- (3) eMBB - High bandwidth
- (4) Massive Machine-Type Communication
- (5) mMTC - Massive IoT
- (6) Ultra-Reliable and Low Latency Communication
- (7) uRLLC - Low latency and high reliability

<http://ccn.ee.nsysu.edu.tw/>

Main Research

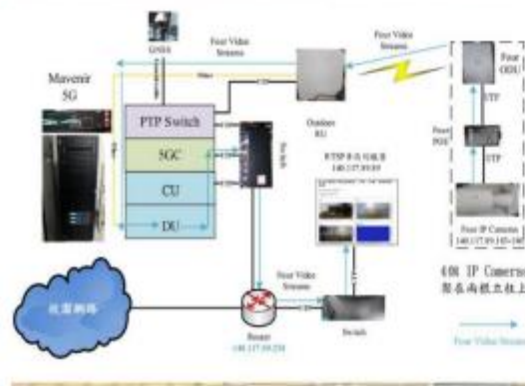
◆ 5G's three major use cases

- **Enhanced Mobile Broadband**
 - **eMBB** - High bandwidth
- **Massive Machine-Type Communication**
 - **mMTC** - Massive IoT
- **Ultra-Reliable and Low Latency Communication**
 - **uRLLC** - Low latency and high reliability

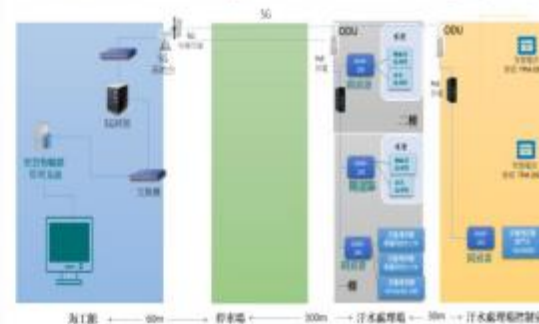
Highlight

Three 5G Campus Experimental Fields

Field I: 5G Intelligent Security Monitoring



Field II: 5G Intelligent Internet of Things (AIoT)



Field III: 5G Automatic Drone Cruising



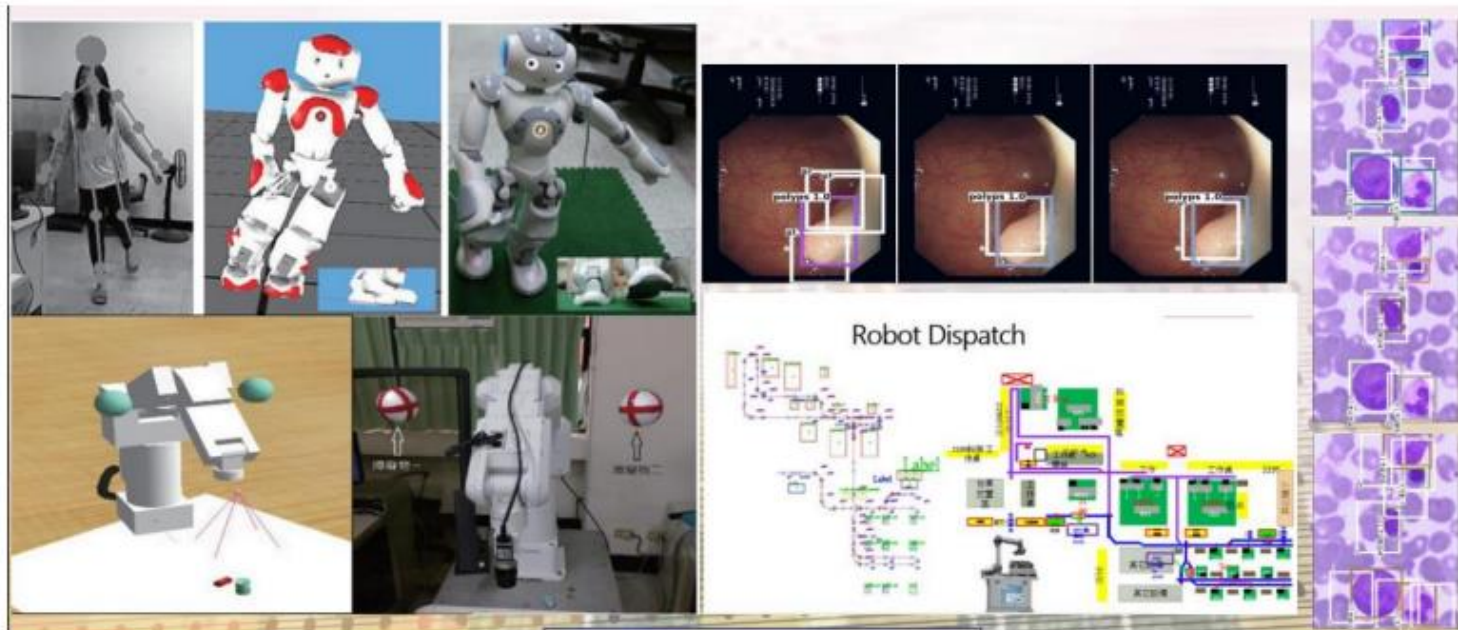
Cruising distance: 500 meters in bay area



Main Research:

- (1) Robotic Assistant Surgery
- (2) Cooperative Autonomous Multi-Agents
- (3) Assistant Robotics
- (4) Compliance Control
- (5) Deep Reinforcement learning on Medical Images
- (6) Deep Reinforcement learning on Factory Automation

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主要研究方向:

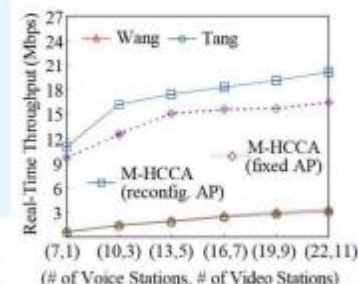
(1) 無線網路: 包含 wireless local area networks、wireless sensor networks、LTE-advanced cellular networks、wireless vehicular networks、cognitive radio networks.

(2) 通訊協定 (結合「人工智慧」與「賽局理論」): 包含 media access control、routing、full duplex、quality-of-service、multimedia transmissions、power saving、network optimization.

Research Results on Multimedia and

Quality-of-Service (QoS): design a new MAC protocol with QoS support for a WLAN with multi-beam access point (AP).

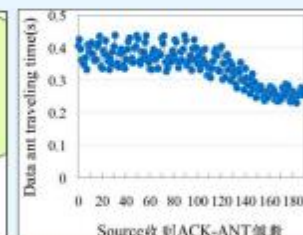
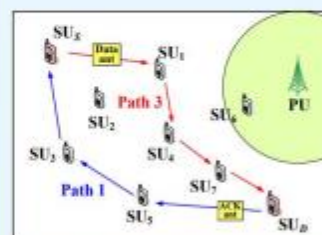
multi-antenna
access point



**Our protocol has
best performances.**

Research Results on Artificial Intelligent

Routing: design a new routing protocol based on any colony optimization (ACO) for multi-hop cognitive ad hoc networks.



**using pheromone
mechanism to find
the fastest path**

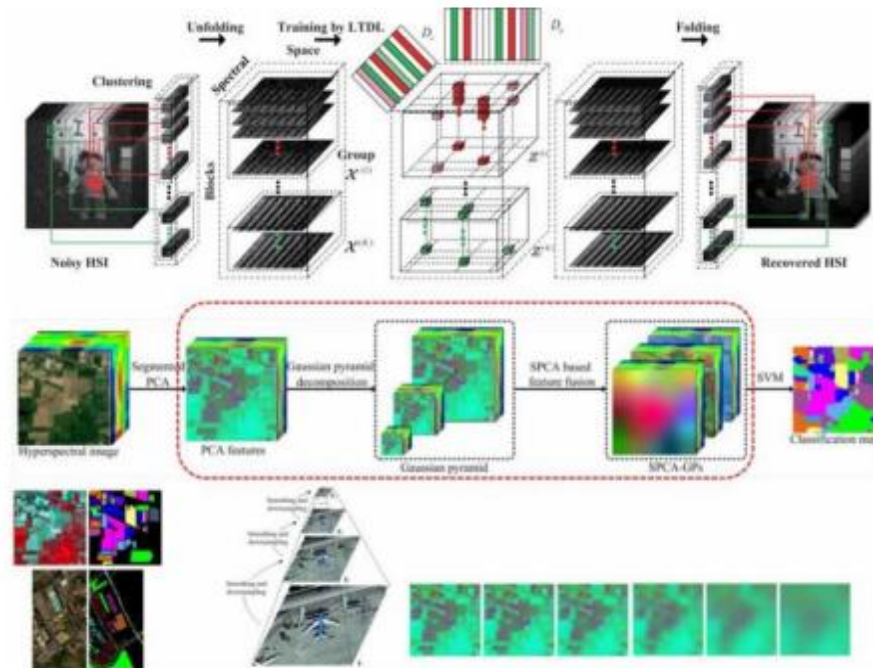
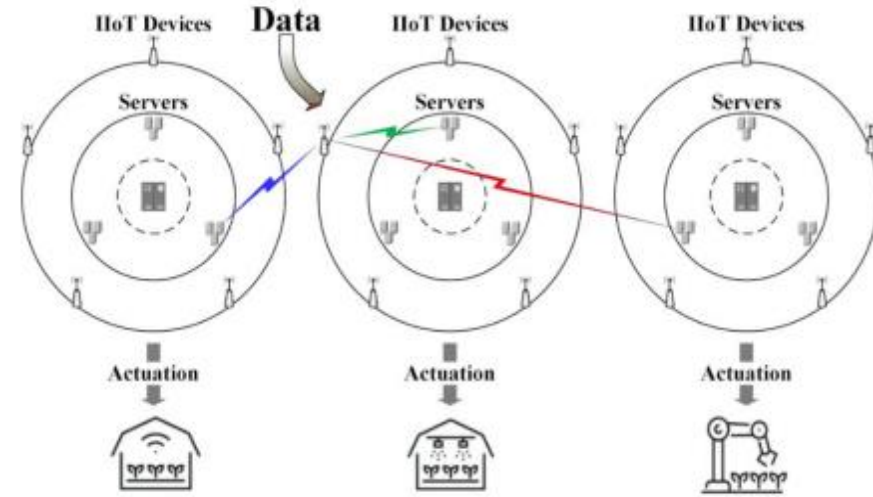
**The time to find the fastest
path is about the traveling
time of 140 ACK-ants.**

主要研究方向:

- (1) 缺失數據分析
- (2) 物聯網、嵌入式系統開發、低功耗機器學習模型
- (3) 感測器網路訊號處理

Main Research:

- (1) Incomplete data analysis
- (2) Internet of Things (IoT) and embedded system designs
- (3) Signal processing based on wireless sensor networks



陳伯煒

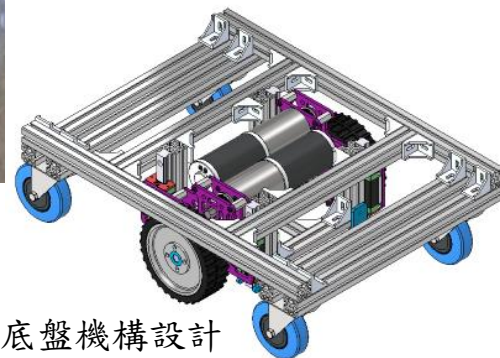
翁愷貽

主要研究方向：

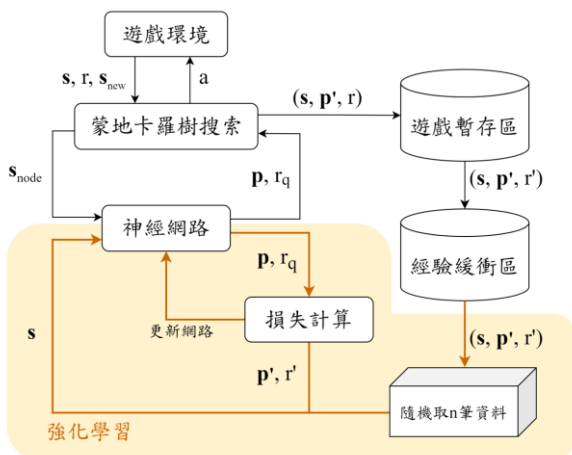
- (1) 自主移動機器人/跟隨機器人
- (2) 強化學習
- (3) 影像辨識

Main Research:

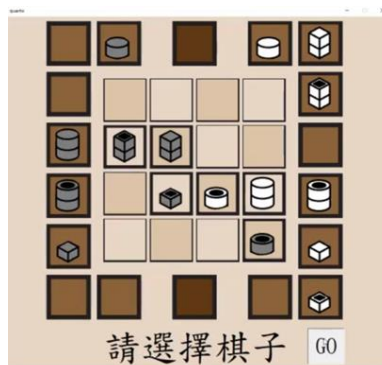
- (1) Autonomous Mobile Robot / Following Robot
- (2) Reinforcement Learning
- (3) Image Processing



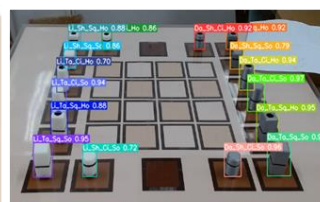
機器人底盤機構設計



▲ MCTS+RL策略的訓練架構圖



人機介面



棋子辨識



即時遊戲策略



TurtleBot3 AutoRace
自駕車挑戰賽