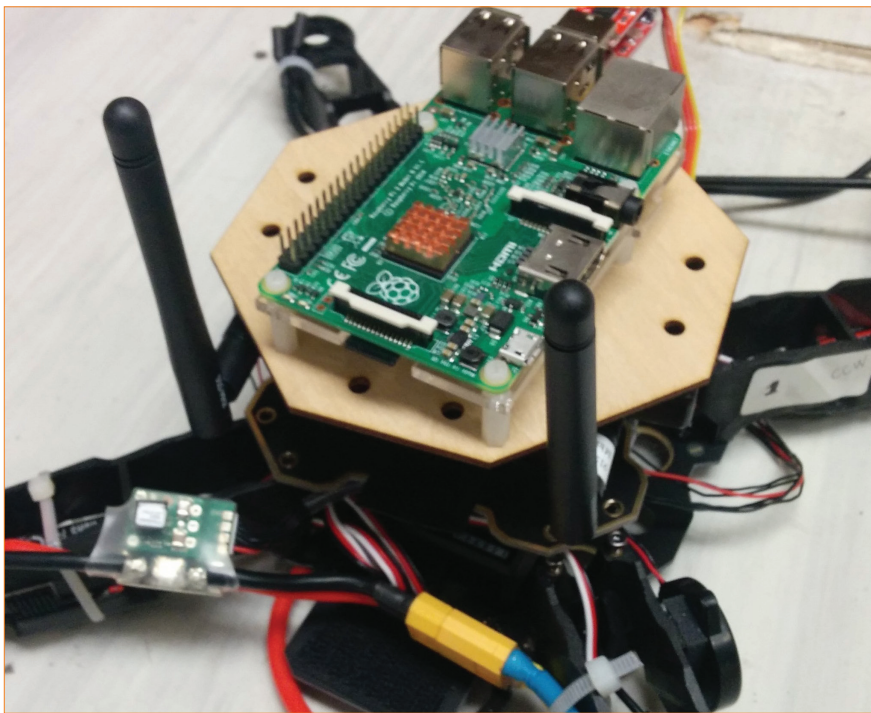


# 多無人機通訊中繼系統 Multiple Unmanned Aerial Vehicles (UAVs) Communication Relay System

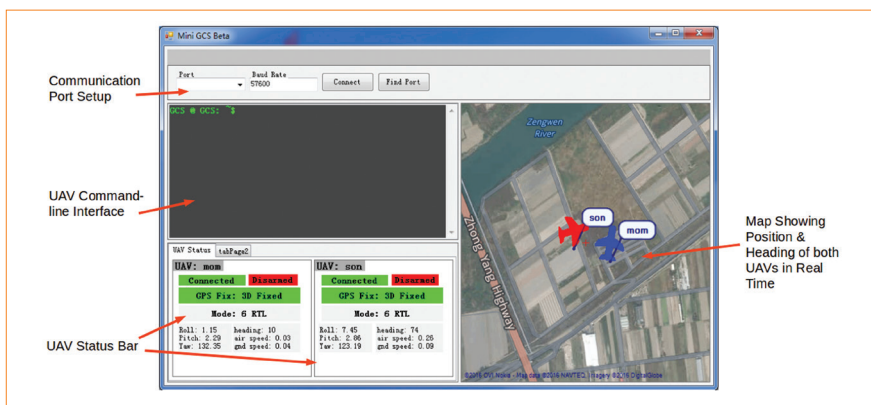
建立無人機之間的相互通訊，擴大通訊距離

For building connection among multiple UAVs and extending communication range

在多無人機系統中，無人機與無人機之間及與地面站之間的通訊都是非常重要的。理大研發的多無人機通訊中繼系統可以實現多機跨障礙通訊，擴展通訊距離，並加強無人機系統在視距外和受障礙物阻隔時的操作。研究團隊已成功於四軸無人機平台測試本系統。除四軸無人機外，本系統亦適用於定翼機和直升機等各種使用 MAVlink 通訊協議的無人機。



無人機上的電腦模組  
Onboard computer module



小型地面站控制系統操作介面  
Graphic user interface (GUI) of Mini GCS

In multiple UAVs systems, UAV-UAV and UAV-ground station communications are very important. This Multiple UAVs Communication Relay System enables multi-UAVs and cross-obstacle communications. It extends the communication range and improves the performance and practicability of UAVs' control in beyond-line-of-sight and cross-obstacle operations. In the test run, the system successfully relayed the radio communications among a number of quadrotors. The relay system is also compatible with other MAVlink communication protocol UAVs, such as fixed-wing and helicopter systems.

## Principal Investigator

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## 特色與優點

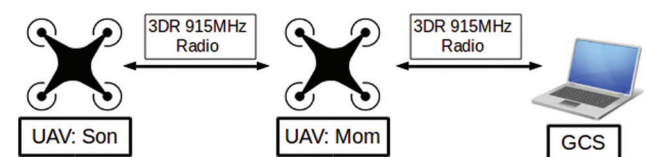
- 適用於多種無人機平台
- 自行開發的多機通訊地面站軟件
- 基於Raspberry Pi的硬件與基於ROS的軟件平台
- 擴大無人機通訊距離，建立跨障礙通訊

## 應用

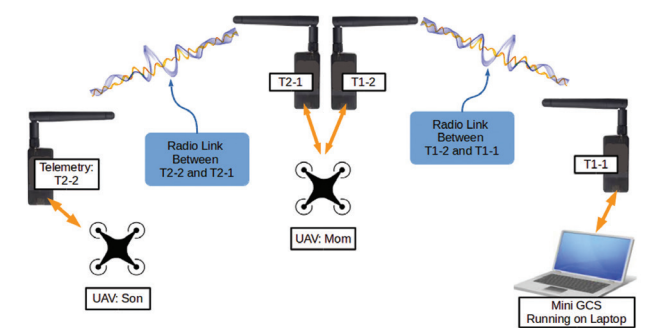
- 多無人機操作系統
- 長距離、跨障礙無人機操作系統

## 獎項

- 第45屆瑞士日內瓦國際發明展 - 評判特別嘉許金獎 (2017年3月)
- 2016台灣無人飛機設計創意設計邀請賽創意組冠軍



多無人機通訊中繼系統架構圖  
Architecture of the communication relay system



無線電通訊中繼系統配置圖  
Radio communication relay setup

## Special Features and Advantages

- Compatible with different kinds of UAV platform
- In-house developed software for Ground Control Station
- Raspberry Pi-based hardware and ROS-based software platform
- Extend communication range and build communication across obstacles

## Applications

- Multi-UAV control system
- Long range and cross-obstacle UAV control system

## Awards

- Gold Medal with the Congratulations of Jury – 45th International Exhibition of Inventions of Geneva, Switzerland (Mar 2017)
- 2016 Taiwan Innovative Unmanned Aircraft Design Competition – Champion of Innovation Category



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