



HACKATHON CHALLENGES

23rd – 25th November 2018

Challenge 1

Virtual Flight Deck

Scenario:

- Produce a virtual flight deck for an autonomous platform flying through a simulated environment

Objectives:

- Parse external track data
- Develop a virtual world model
- Create controllable platforms
- Render external tracks in FOV



Challenge 2

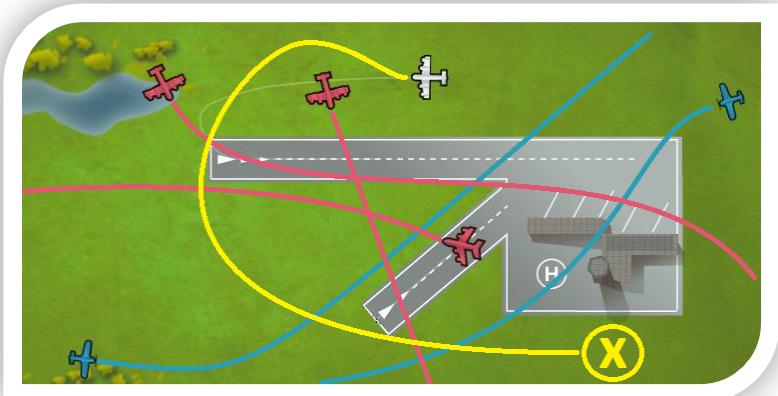
Autonomous Detect and Avoid

Scenario:

- Manned platforms flying in congested airspace
- Create a virtual platform/s with behaviour for avoiding the manned platforms

Objectives:

- Parse the ADS-B “manned platform” data
- Create a virtual unmanned platform
- Write an algorithm for avoiding manned entities
- Develop a means of visualising flight paths, separation distance, alerts, etc



Challenge 3

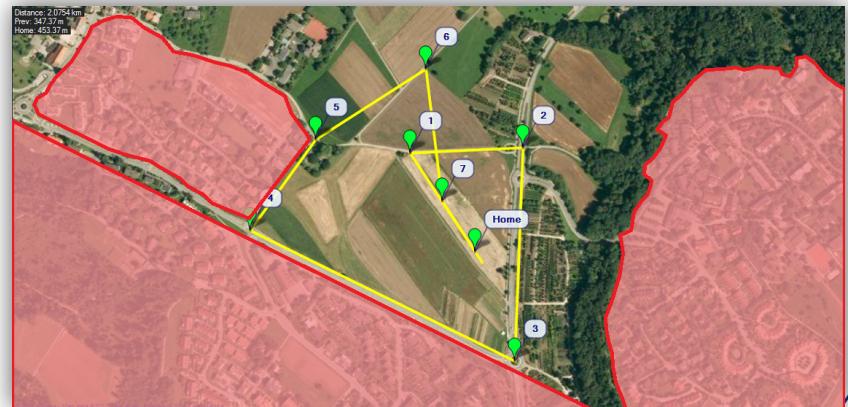
UAV Mission Control

Scenario:

- Automate and optimise UAV missions for inspecting Point of Interest (POIs)

Objectives:

- Parse POI data
- Create an algorithm for optimising POI inspection
- Develop a means of visualising missions
- Add in “no-fly-zone” avoidance
- Include re-fueling/re-charging considerations into algorithm



Challenge 4

Airborne Imagery Analysis

Scenario:

- Use image classification techniques to identify ground artefacts in airborne video data

Objectives:

- Develop a classification models for:
 - Recognising ground cover types
 - Identifying objects
- Train and refine model with test data

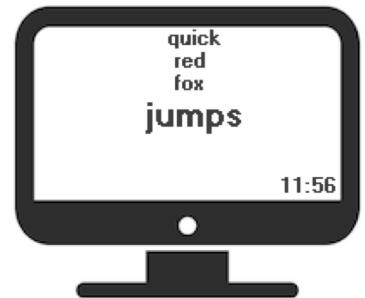


Challenge 5

Intercepting Encrypted Data Links

Scenario:

- An adversary operations centre is sending encrypted messages to airborne platforms
- Messages are decrypted and display via a Data Link Console
- A working DLC has been acquired by allied intelligence



Objectives:

- Penetrate the protected RF network (WiFi)
- Reverse engineering the message protocol and encryption algorithm
- Intercept and spoof messages into an encrypted wireless network
- Deny operations network from sending messages



