

Instructions for Drones Game Experiment

This is an experiment that we will use to collect data for the Evaluation Methods and Statistics Lab Classes. This will count as ‘Lab 1’ of the module.

I expect that this session should take no more than 60 minutes to complete.

You will play the game four times – once as a practice run to familiarise yourself with the instructions, user interface and controls of the game; and three times to collect data.

After the data collection runs, you will submit the csv files of your data and the consent form (see point 2 below) to Canvas (as Assignment 1 for this module).

Step-by-step Instructions

1. Install and unzip the game from this link:

<https://drive.google.com/file/d/1TzLj-2sgYEEoQHLTfX2zRCPdXufuLp0a/view?usp=sharing>

2. Read the Participant’s Sheet
3. Sign the Consent Form (and save for this to submit with your results file)
4. Practice Run
 - a. Make sure that your computer is connected to a wifi network (this is not because there is any monitoring from the game but to use some of the javascript functionality)_
 - b. Select the ‘Drones Game’ application
 - c. Set up screen (change the following elements)

Number of Drones	10
User defined threat	Grey
Path length	5
Predicted paths	Grey
Area of Risk Shape	Grey (“POLY”)
Decision space	Radar
Decision space steps	3
Enemy	Grey (“RED”)
Hide drones	Grey
Destroy drones	Grey
Stop the game after 15 mins	Grey
Drones regen	Green
Participant id	000

The screen should look like the following figure (DO NOT press the 'start game' button until you have read how to the 'game play' in the next section).



d. Game play

- i. Your task is to disable any red drone that flies close to the protected houses (shown with orange area around them)
- ii. To disable a drone, select the beacon closest to the protected house using number keys (1, 2 or 3) or by clicking on a beacon. This will change the colour of the beacon. When a beacon is yellow, it is selected.
- iii. To activate the beacon, press the space bar or click on the lightning bolt on the bottom right of the screen. This will do three things – it will change the colour of the beacon range indicator from green to purple, it will reduce the energy available to the beacon (which means that the range of the beacon will get smaller, as shown by the reducing green circle) and it will reduce the energy of any drone in range.
- iv. You should stop the beacon (by pressing the space bar again to turn it off) if a non-hostile drone enters the space or if the hostile drone is over a protected house.
- v. The beacon will re-energise if you press the space bar (toggling between on and off) or if it has got to minimal energy.
- vi. You can have more than one beacon active at a time.
- vii. In this practice trial, you want to try to only disable red drones and allow any other drones to fly with being affected. This means that you might want to wait until other drones are clear of the area.
- viii. Some of the drones might change colour (from red to yellow), indicating that they are hostile within range but unknown out of range.
- ix. To help you, three radar charts are shown at the top of the display (one for each beacon).
 1. The radar charts shows when a hostile (red) drone can be affected by a beacon and outside of a risk area. This is when the bottom triangle of the radar chart is filled. You should only act when the bottom triangle of the radar chart is filled.
 2. If either a friendly drone is in the area or the hostile drone is in a risk area, then the radar chart has a different shape. In these cases, you should wait.

3. If the radar chart changes from a filled bottom triangle to any other shape, you should deactivate the beacon immediately (in order to reduce risk).
4. The radar chart also shows the beacon energy level (the dot at the top of the radar chart, which moves down when the beacon is activated; and moves up when the beacon is recharging).
- x. When a drone has been disabled, its energy level (shown by a bar next to it) will be reduced. Drones with low energy are not a threat (because they do not have power to drive their sensors). Over time the energy of the drone will rebuild. When the drone has sufficient energy, it becomes a threat again and you will need to disable it.
- xi. Set a timer on your phone for 5 minutes and then press 'Start Game'.
- xii. After 5 minutes, press 'esc' on the keyboard to stop the game.
- xiii. There is a file called 'recordings' which stores the data for this run (with the prefix '000' to indicate that it is a practice run).
- xiv. If you are confident that you understand how the game should be played, then you can proceed to the Experiment. If you are not confident, have another practice trial.

Experiments

You will repeat the game three times.

Each time you will play for 10 minutes.

Each time will involve a different configuration on the set-up screen. Please make sure that you set the game up correctly for each condition (so that we can compare the right conditions in the analysis).

For each time you play the game, 2 files are saved in the 'Recordings' folder (one labelled 'config' and one 'analysis'). The file names have the Participant id (with number of drones and a game number). **Please include both files for all three games plus your consent form in your submission.**

Game 1: BOTH-RED

In this condition, you have the map of the drones and the radar plots. You need to disable only the red drones and try not to affect the other drones.

Number of Drones	15
User defined threat	Grey
Path length	5
Predicted paths	Grey
Area of Risk Shape	Grey ("POLY")
Decision space	Radar
Decision space steps	3
Enemy	Grey ("RED")
Hide drones	Grey
Destroy drones	Grey
Stop the game after 15 mins	Grey
Drones regen	Green
Participant id	R4B

Game 2: SELF-RED

In this condition, you will only see the drones flying around. You need to disable only the red drones and try not to affect the other drones.

Number of Drones	15
User defined threat	Grey
Path length	5
Predicted paths	Grey
Area of Risk Shape	Grey (“POLY”)
Decision space	None
Decision space steps	3
Enemy	Grey (“RED”)
Hide drones	Grey
Destroy drones	Grey
Stop the game after 15 mins	Grey
Drones regen	Green
Participant id	R4S

Game 3: AUTO-RED

In this condition, you will only see the radar plot. When the bottom triangle is filled, you turn on the beacon. As soon as the bottom triangle stops being filled, then you should turn off the beacon.

Number of Drones	15
User defined threat	Grey
Path length	5
Predicted paths	Grey
Area of Risk Shape	Grey (“POLY”)
Decision space	Radar
Decision space steps	3
Enemy	Grey (“RED”)
Hide drones	Green
Destroy drones	Grey
Stop the game after 15 mins	Grey
Drones regen	Green
Participant id	R4A