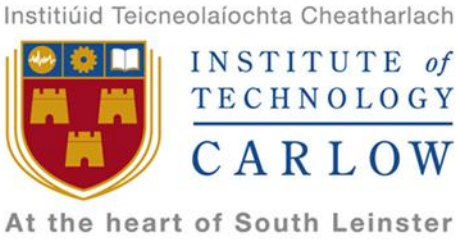

DRONE AIR TRAFFIC CONTROL SYSTEM

Design Specification

By

Brendan Mitchell

Title: Drone Air Traffic Control System - Design specification

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Organisation: IT Carlow

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Section 1 - Introduction

In this document the design of the system will be shown. This will include class diagrams, sequence diagrams and a system diagram. The technologies to be used will also be introduced and explained as to their purpose in the project.

Section 2 – Diagrams

Section 2.1 – System Diagram

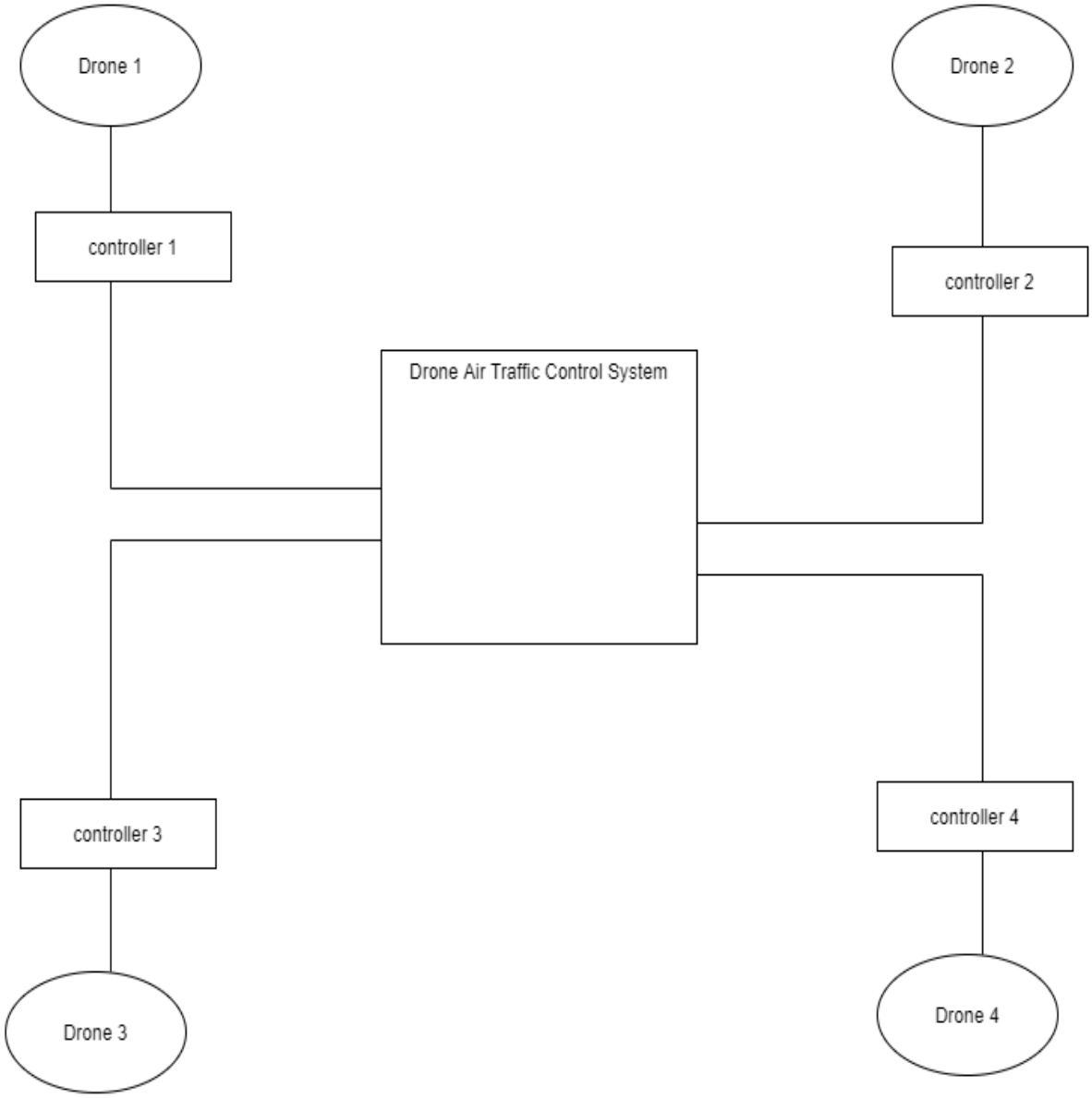


Figure 1. System Diagram

Section 2.2 - Class Diagram

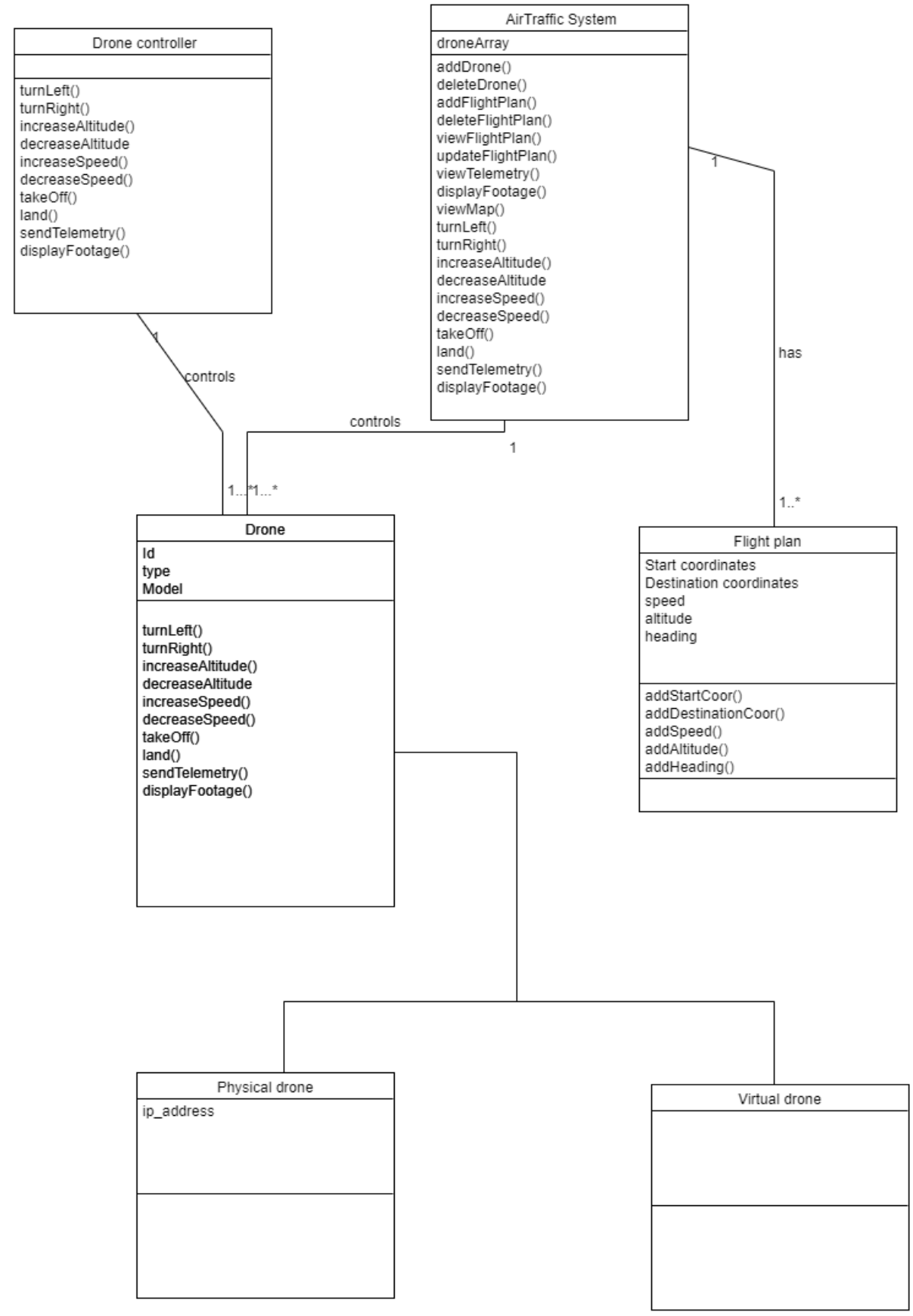


Figure 2. Class Diagram

Section 2.3 – Sequence Diagrams

Add Drone

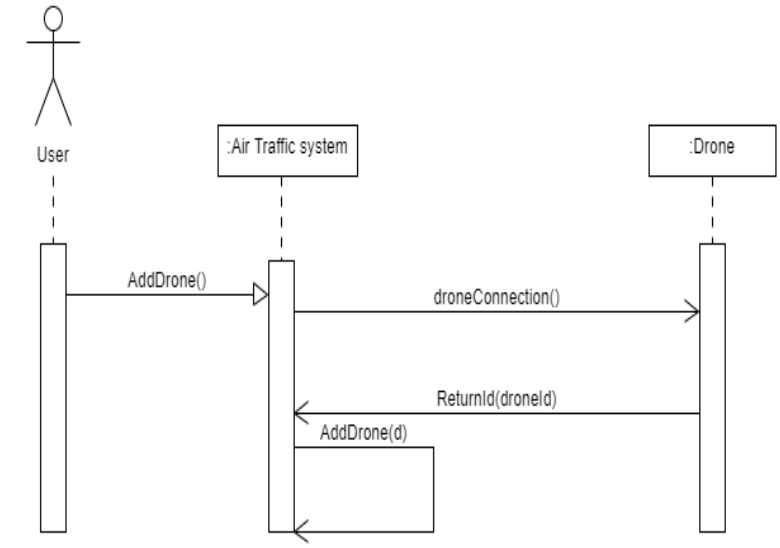


Figure 3. Add Drone Sequence Diagram

Delete Drone

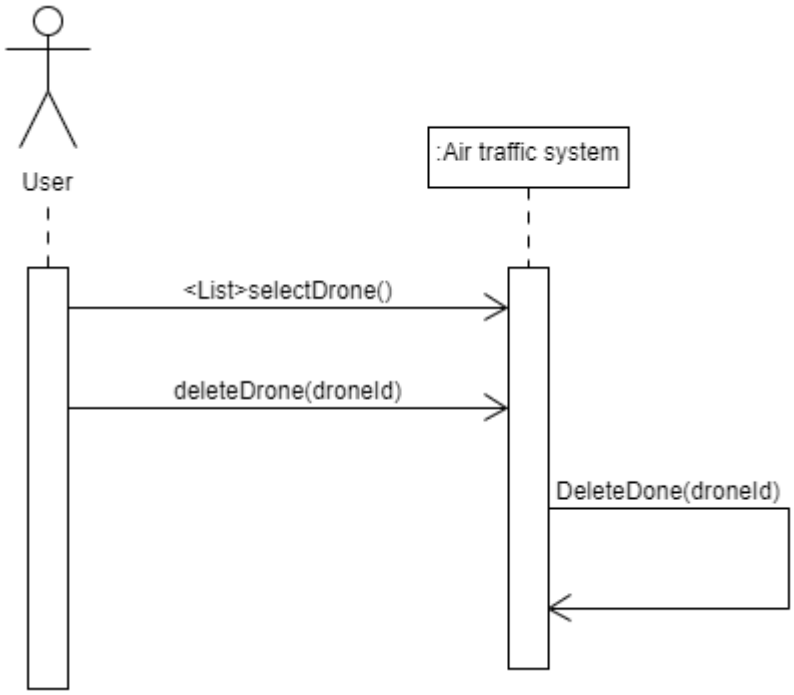


Figure 4. Delete Drone Sequence Diagram

Add Flight Plan

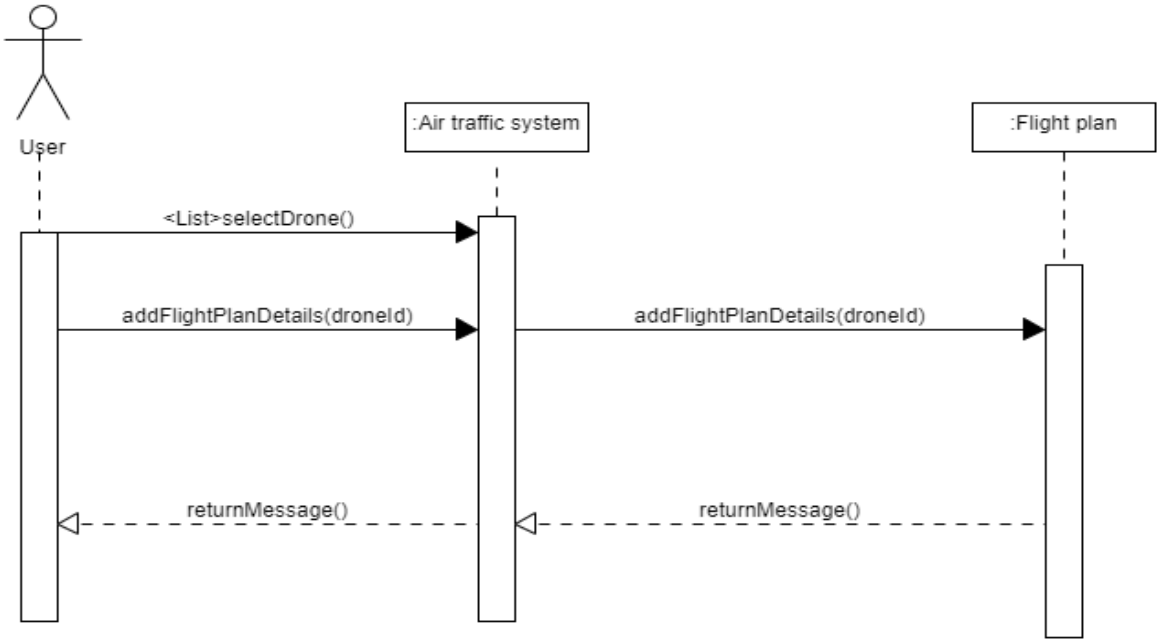


Figure 5. add flight plan sequence diagram

View traffic plan

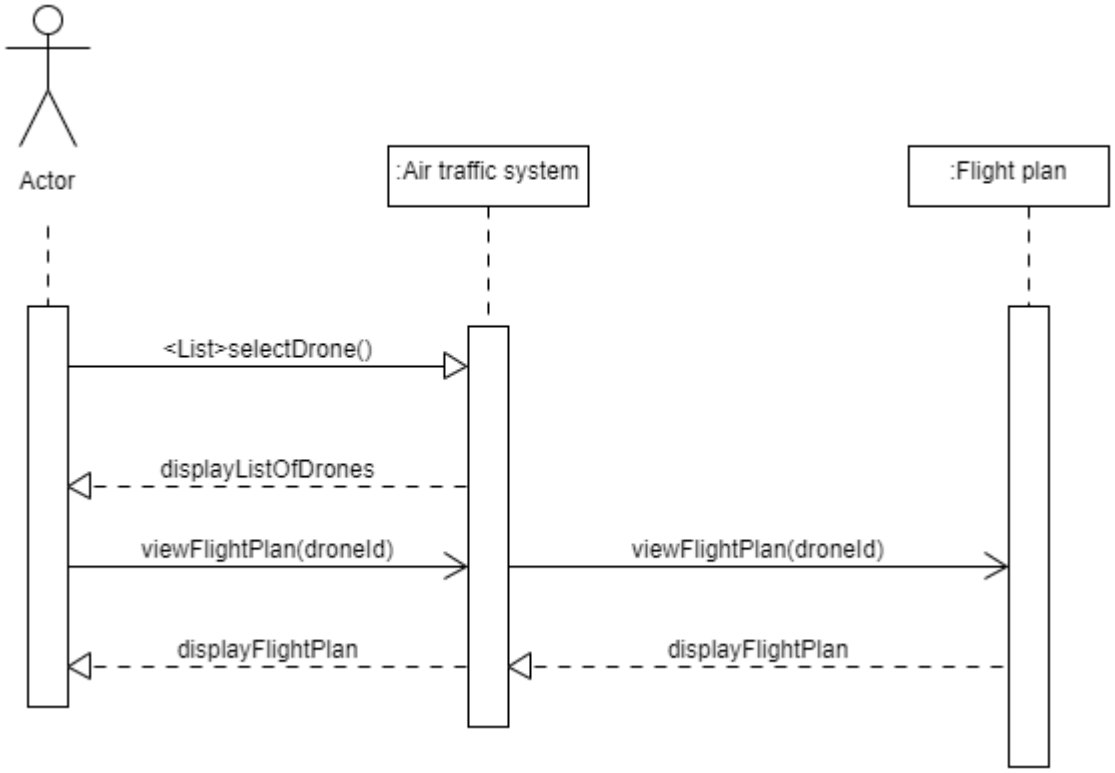


Figure 6. View traffic plan sequence diagram

Delete Flight Plan

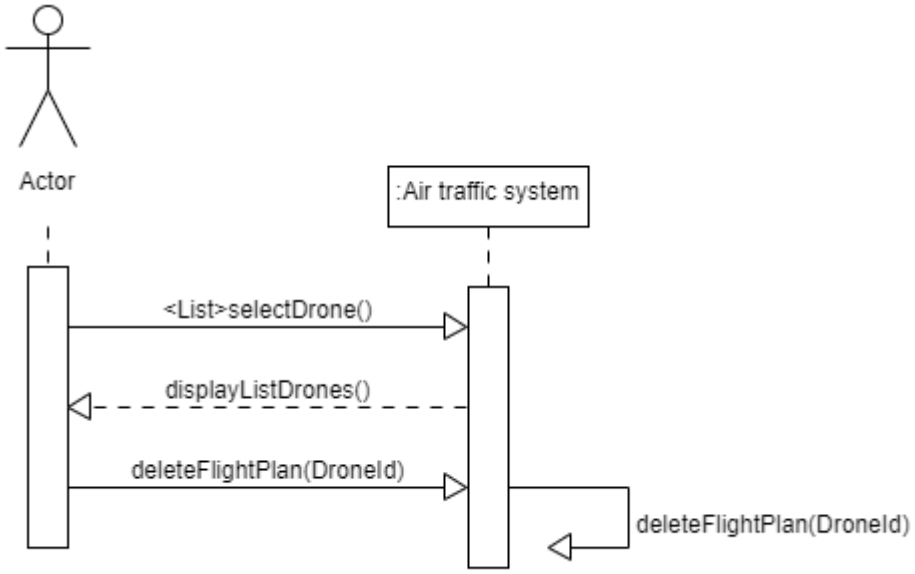


Figure 7. Delete Flight Plan sequence diagram

Update Flight Plan

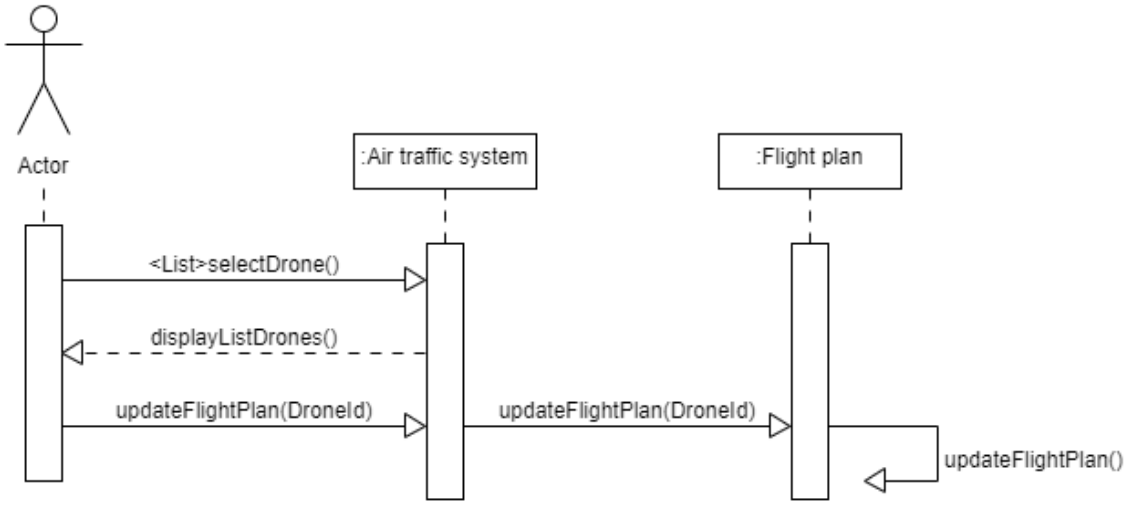


Figure 8. Update flight plan sequence diagram

Control Drone

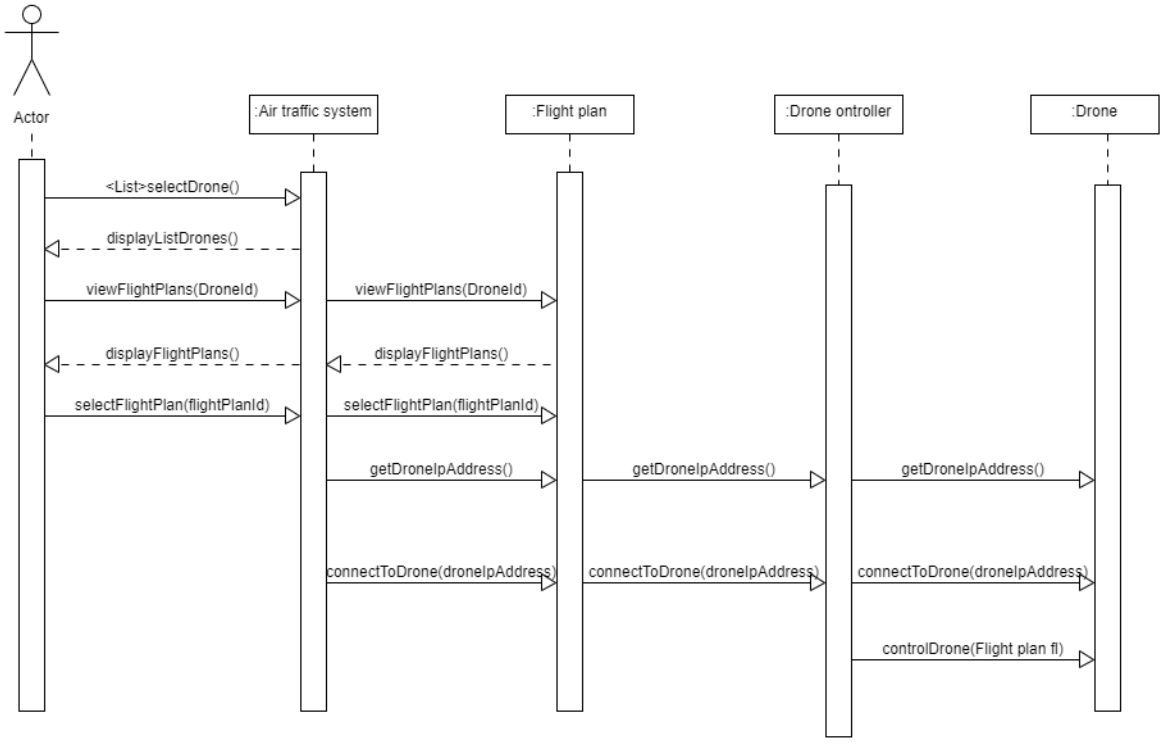


Figure 9. Control Drone sequence diagram

Receive Telemetry

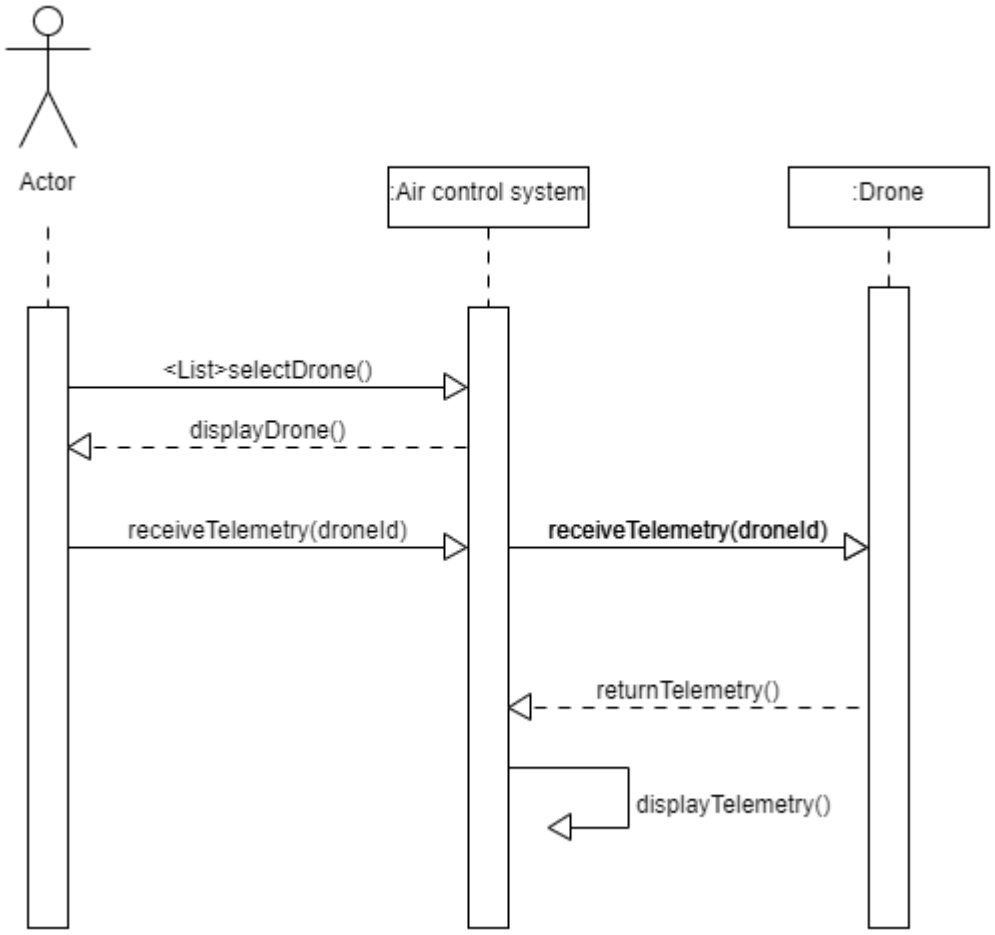


Figure 10. receive telemetry sequence diagram

Display Footage

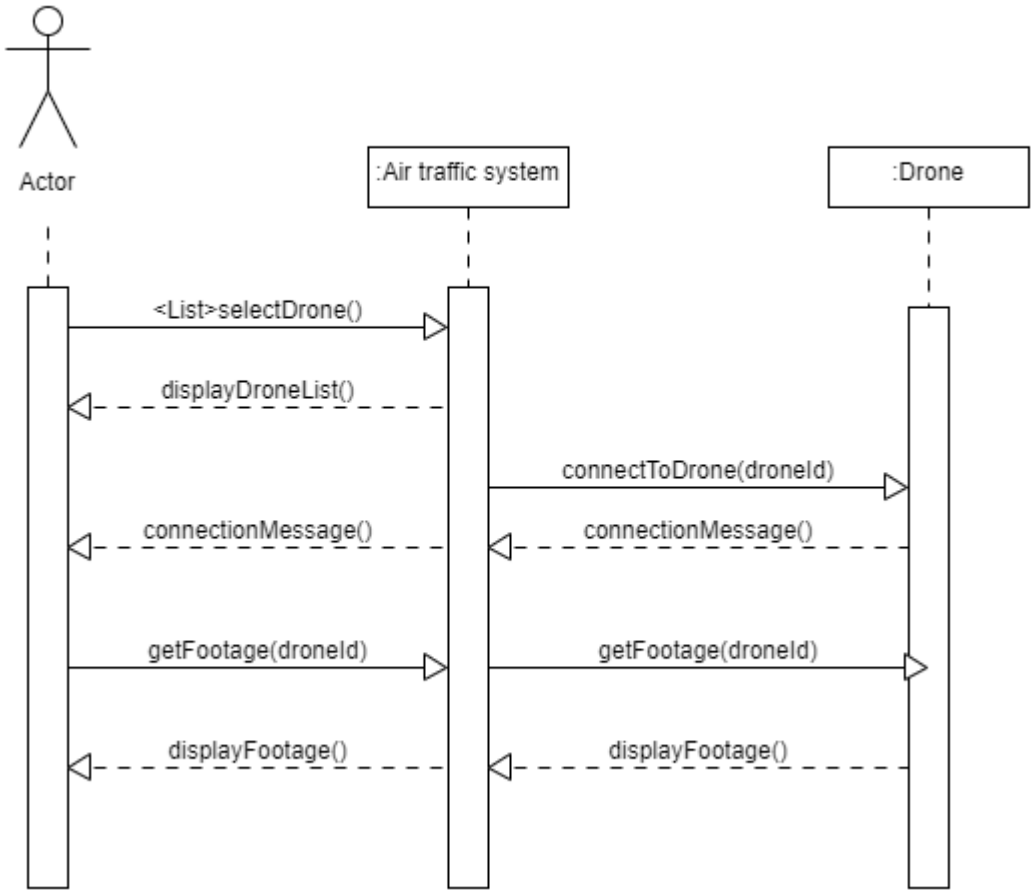


Figure 11. Display Footage sequence diagram

Display Map

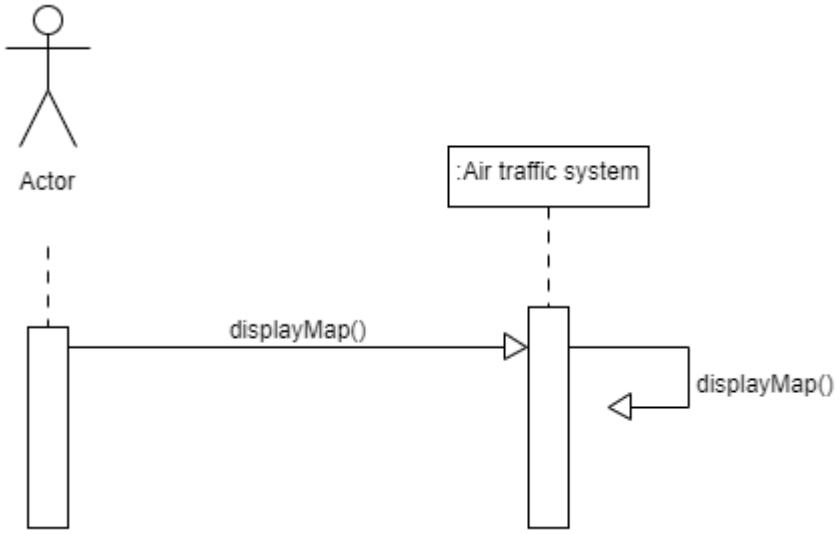


Figure 12. Display Map sequence diagram

Section 3 – Technologies

Platform

Ubuntu 18.04.

Python

Python is an interpreted, high-level, general-purpose programming language.

PyQt

PyQt is a Python framework. It is a python interface for QT. QT is a cross platform development framework.

Visual studio code

Visual Studio Code is a source-code editor. It can be used in Windows, Linux or mac os.

Olympe

Olympe is framework that provides a programming interface for the Parrot drone. This framework is written in python and it can be used to connect to a parrot drone and then control the drone's movements (Parrot 2018).

PyParrot

Pyparrot is a python interface for the parrot drones. It was designed by Dr. Amy McGovern. It can be used to control the parrot mambo, parrot bebop and parrot mini-drones. There is a lot of information online which guides the user through installation, testing and the different functions that can be carries out through the interface (Amy McGovern. 2018).

Sphinx

SPHINX is a tool available to developers which allows for the simulation of the drones.

Section 4 – Sudo Code for Loop

Drone takes off

Drone receives instructions based on flight path

Drone checks if any collisions predicted

If not drone follows instruction issued to it

Else drone hovers

Collision and detection loop

Loop starts again

Section 5 – Sudo Code for Collision Avoidance and Detection

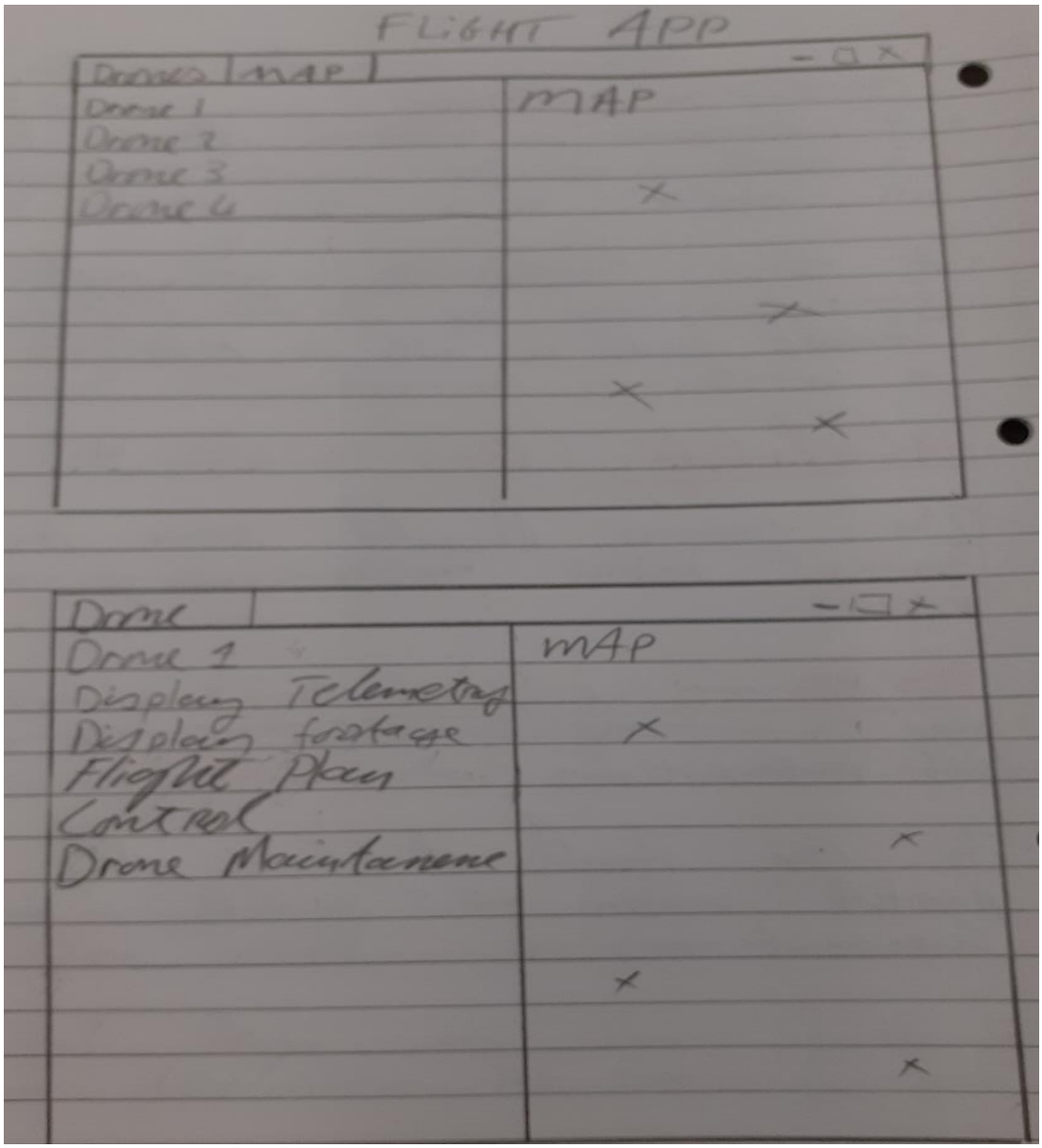
Drone hovers if collision detected

System calculates which drone should alter its course

The chosen drone corrects its heading

Drones then continue to follow instruction from system

Section 6 – GUI



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[Accessed 21 Nov. 2019].

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[online]Available at:
https://developer.parrot.com/docs/olympe/overview.html,
[Accessed 22 October 2019]

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CARLOW

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*I have provided a complete bibliography of all works and sources used in the preparation of this submission.

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