COMP4910 Senior Design Project 1, Fall 2020

Advisor: MUTLU BEYAZIT

Cyber Drone

Drone Simulation

Requirements Specifications Document

15.12.2020

REVISION 1

BY:

EGE ERBERK USLU

BORA GÜZEL

SİMGE BİNNAZ ÖZDEMİR

Revision History

Revision	Date	Explanation
1.0	15.12.2020	Initial requirements

Contents

1. Introduction

The purpose of the software project is to develop a 3D simulation software in a game engine such as Unity or Unreal Engine environment, in C# or C++ programming language to do mainly the following:

1- Users should be able to orient the drones like up, down, right, left direction and observe the flight of drones in different environmental conditions.

2- Large numbers of the users would like to control and customize the drones.

3- Administrators should be able to access reports on events which have occurred in the simulation.

2. Functional and Data Requirements

2.1 User Main Interface Requirement

2.1.1 Login

The users that are enrolled in simulation are able to access and use simulation via the login system. The system will require a username and a password for the login process.

2.1.2 Start

The user should be able to start the simulation. After the related user input the system will start the simulation beginning process.

2.1.3 Setting

The user should be able to change general application settings such as language, resolution, key bindings, sound, etc.

2.1.4 Replays

The user should be able to watch replays that the user saved before.

2.1.5 Quit

The user should be able to quit from the game. After the related user input the system will start the simulation closing process.

2.1.6 Help & Updates

The ordinary user should be able to get help from the community or from the web page when the user is faced with a problem.

2.2 Simulation Main Control Requirement

2.2.1 Drone customization and selection

The ordinary user should be able to select the drone that the user desires. The system displays existing drone models to the user. The ordinary user should be able to customize the drone with the appropriate features of the project that will be simulated such as color, battery, propeller type before starting the simulation.

2.2.2 Map selection

The ordinary user should be able to select the map that the user desires. The system displays existing maps to the user.

2.2.3 Weather customization & selection

The ordinary user should be able to select the weather conditions that the user desires. The system displays existing weather conditions to the user. The users are able to customize the weather conditions as the user pleases.

2.2.4 Save & Start Replay

The ordinary user should be able to record their own simulation. After the related user input the system will start the capturing process. According to user desire, the system will save the record.

2.2.5 Enable/Disable AI

The ordinary user should be able to activate/deactivate artificial intelligence for their simulation. With this feature the user is able to watch AI-trained drone maneuvers.

2.3 Drone Control Requirement

The users should be able to control the drone with assigned key bindings. With these capabilities, users may utilize different maneuvers that mentioned below.

2.3.1 Lift off

2.3.2 Landing

2.3.3. 360 degree movement

2.4 Administration Panel Requirement

2.4.1 Authorization and Authentication

The admins should be able to give users login authorization.

2.4.2 Analyzing the Feedbacks

The admins should be able to analyze information about the feedback that came from the reporting process. The admins can also provide feedback to the ordinary user regarding this information.

2.4.3 Reporting

2.4.3.1 Bug detection

The system will detect bugs in simulation and will give detailed feedback about them to the administrator.

2.4.3.2 Collision detection

The system will gather up the related data and save it into the database when an experimental collision occurred.

3. Non-Functional Requirements

3.1. Development Environment Requirement

The software will be developed in Unity or game engine language such as C#. The development and operation environment is any Windows .

3.2. Security Requirement

All client-server operations through the Internet will be through SSL to provide security. All the data which will be transferred to the database, is transferred to the server via encryption. Vice-versa is also valid. Necessary data will be stored in a database with its encrypted versions.

3.3. Logging Requirement

Actions of all administrators regarding user/admin deletion and creation must be logged to a file and info about such actions must be emailed to the first administrator in the list of all administrators, the master administrator.

3.4. Testing Requirement

The test document must cover the details of testing the correct operation and boundary conditions of each requirement in Section 2. The details of the testing document will be produced during the design.

3.5. Server Capacity Requirement

Related system can support multiple users without crashing.