**Capture the Campus!**

**Initial Report**

Submitted for the BSc in   
Computer Science

October 2016

By

**Alexander C Whitehead**

Word Count:

Table of Contents

[1 Introduction 3](#_Toc463896571)

[2 Background 4](#_Toc463896572)

[3 Aim and Objectives 5](#_Toc463896573)

[Objective 1 – Objective title goes here if you can think of one 5](#_Toc463896574)

[Objective 2 – Objective title goes here if you can think of one 5](#_Toc463896575)

[4 Task List 6](#_Toc463896576)

[5 Time Plan 8](#_Toc463896577)

[6 Risk Analysis 10](#_Toc463896578)

[References 11](#_Toc463896579)

# Introduction

This is a report describing the initial design and research stages of the project to build an augmented reality, mobile platform based game.

The game, called Capture the Campus, is based on a combination of the classic 80’s arcade game Qix and the currently popular mobile game Pokémon Go. The objective of the game will be to either in teams or individually capture parts of a predefined area by physically traveling through it while the game running on a mobile device in the players’ possession tracks the player’s movement.

To implement functionality a client and server should be created. The client will be created using Xamarin as it allows for the development of a cross platform solution that is easily debugged for rapid prototyping. The server will be created using C#/Xamarin as this will allow for the server to be run from both a desktop or mobile device, this is desirable as it allows the use of a predefined external server or alternatively a ‘on the fly’ local server run from the client’s mobile device. The server will use both UDP and TCP protocols, UDP will be used to acquire a connection to the server from the client and TCP will be used once this connection has been attained as it is more secure and less likely to lose packets.

This report includes: A section discussing background research conducted and creative/contextual decisions made thusly, a section covering the aims and objectives of the project, a breakdown of the intended task list and time required to complete each individual task and a risk analysis section which will identify and then attempt to rectify any risks associated with the intended project.

# Background

# Aim and Objectives

State the overall aim of your project here

Some text here to indicate that the above aim will be met by the following numbered objectives:

1. Write approximately one sentence to outline what the objective is here
2. Include as many objectives as you think reasonable but remember that these are not as fine grained as the tasks which will come later.

## Objective 1 – Objective title goes here if you can think of one

Here you should be writing a more detailed description of what this objective is. It should explain how it contributes towards the aim, what the deliverable(s) of the objective is/are, and how you intend to evaluate it.

## Objective 2 – Objective title goes here if you can think of one

Do this for each one of your objectives.

# Task List

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Task Name** | **Description** | **Duration**  **(weeks)** |
| 1 | Research | Conduct research that will aid in the writing of reports and initial designing of the project | 11 |
| 2 | Initial report | Write the initial report deliverable | 2 |
| 3 | Create server client | Create a client that is capable of interfacing with the server | 5 |
| 4 | Create TCP server | Create a TCP server that can accept TCP packets from the client | 2 |
| 5 | Add UDP to server | Add UDP to the server that can be used to identify the IP if the server | 1 |
| 6 | Add multithreading capabilities to server | Add multithreading to the server so that it is capable of accepting more than one client request at a time | 2 |
| 7 | Create main menu for game | Create a main menu for the game that will be displayed when the game is started and between every game instance. The main menu should display all options for game types and settings etc. | 1 |
| 8 | Add game screen and assets to game | Add a game screen to the game that is displayed once the play game option is selected and also add assets to the game to be used to display player characters etc. | 2 |
| 9 | Add map to game screen | Add a suitable map to the game screen | 3 |
| 10 | Add translations and scaling to map | Add translations and scaling to the map so that it is possible to move the map around and zoom in and out | 2 |
| 11 | Add player character and movements to map | Make the player character move as the player moves. This should probably work via GPS. | 2 |
| 12 | Interim report | Write the interim report deliverable | 3 |
| 13 | Final report | Write the final report deliverable | 14 |
| 14 | Add client calls to store and recall player positions from server | Make the game send its current location to the server at a reasonable interval and also make it so that the game requests the location of every other player | 3 |
| 15 | Add tracking data and bounds of playing field to game | Make it so that the game then draws all the players at the correct locations and that it is possible to create the area of play | 2 |
| 16 | Add taking mechanics from tracking data to game | Make it so that when a player completes a run from one side of the playing area to another they take the smallest area for their own team | 2 |
| 17 | Add killing mechanics from tracking data | Make it so that if a player crosses the track of another active player one of the players dies | 2 |
| 18 | Add scoring data to game | Make it so that the score of all players is tracked based on the area of land taken | 2 |
| 19 | Add team mode to game | Make it so that players can play in teams | 3 |
| 20 | Add multigame server | Make it so that multiple game instances can run on one server | 3 |

# Time Plan

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Task Name** | **University Calendar Weeks** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
| 1 | Research |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 | Initial report |  |  |  | D |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3 | Create server client |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4 | Create TCP server |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5 | Add UDP to server |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6 | Add multithreading capabilities to server |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7 | Create main menu for game |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 8 | Add game screen and assets to game |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 9 | Add map to game screen |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 10 | Add translations and scaling to map |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 11 | Add player character and movements to map |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 12 | Interim report |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | D |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 13 | Final report |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | D |
| 14 | Add client calls to store and recall player positions from server |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 15 | Add tracking data and bounds of playing field to game |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 16 | Add taking mechanics from tracking data to game |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 17 | Add killing mechanics from tracking data |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 18 | Add scoring data to game |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 19 | Add team mode to game |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 20 | Add multigame server |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

# Risk Analysis

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Risk** | **Current Risk** | | | **How to Avoid** | **How to Recover** | **Residual Risk** | | |
| **Severity**  **(L/M/H)** | **Likelihood**  **(L/M/H)** | **Significance (Sev. x Like.)** | **Severity**  **(L/M/H)** | **Likelihood**  **(L/M/H)** | **Significance (Sev. x Like.)** |
| Data loss | H | M | HM | Keep Backups | Reinstate from backups | L | M | LM |
| Loss of backups | H | L | HL | Multiple Backups | Use alternate | L | L | LL |
| Underestimate workload | H | M | HM | Regularly review progress against Time Plan | Invest more time into work, possible reduction of objectives | H | L | HL |
| Critical error in deliverable | H | M | HL | Perform adequate research | Debug code | H | L | HL |
| Skill Risk | M | M | MM | Perform adequate training | Invest more time into research | L | L | LL |
| Scope Creep | M | H | MH | Fully define scope | Define scope at current point | M | L | ML |
| Inefficient Program Performance | H | L | HL | Spend time testing code | Remove extraneous features | M | L | ML |
| Server Crashes | M | M | MM | Attempt to optimize server code | Implement alternative servers | L | L | LL |

References

**There are no sources in the current document.**