

## Declaration Cover Sheet for Project Submission

### SECTION 1 *Student to complete*

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### SECTION 2 Confirmation of Authorship

*The acceptance of your work is subject to your signature on the following declaration:*

I confirm that I have read the College statement on plagiarism (summarised overleaf and printed in full in the Student Handbook) and that the work I have submitted for assessment is entirely my own work.

Signature: Neil Vaughan

Date: 11/12/16

NB. If it is suspected that your assignment contains the work of others falsely represented as your own, it will be referred to the College's Disciplinary Committee. Should the Committee be satisfied that plagiarism has occurred this is likely to lead to your failing the module and possibly to your being suspended or expelled from college.

**Complete the sections above and attach it to the front of one of the copies of your assignment, What constitutes plagiarism or cheating?**

The following is extracted from the college's formal statement on plagiarism as quoted in the Student Handbooks. References to "assignments" should be taken to include any piece of work submitted for assessment.

Paraphrasing refers to taking the ideas, words or work of another, putting it into your own words and crediting the source. This is acceptable academic practice provided you ensure that credit is given to the author. Plagiarism refers to copying the ideas and work of another and misrepresenting it as your own. This is completely unacceptable and is prohibited in all academic institutions. It is a serious offence and may result in a fail

grade and/or disciplinary action. All sources that you use in your writing must be acknowledged and included in the reference or bibliography section. If a particular piece of writing proves difficult to paraphrase, or you want to include it in its original form, it must be enclosed in quotation marks and credit given to the author.

When referring to the work of another author within the text of your project you must give the author's surname and the date the work was published. Full details for each source must then be given in the bibliography at the end of the project

### **Penalties for Plagiarism**

If it is suspected that your assignment contains the work of others falsely represented as your own, it will be referred to the college's Disciplinary Committee. Where the Disciplinary Committee makes a finding that there has been plagiarism, the Disciplinary Committee may recommend

- that a student's marks shall be reduced
- that the student be deemed not to have passed the assignment
- that other forms of assessment undertaken in that academic year by the same student be declared void
- that other examinations sat by the same student at the same sitting be declared void

Further penalties are also possible including

- suspending a student college for a specified time,
- expelling a student from college,
- prohibiting a student from sitting any examination or assessment.,
- the imposition of a fine and
- the requirement that a student to attend additional or other lectures or courses or undertake additional academic work.

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BSc in Computing  
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Technical Report



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## **Executive Summary**

My objective is to create a first person shooter game. The player navigates through the level, shooting targets and trying to finish the level as quickly as possible. The player's time to complete to level will be recorded, and the aim is to improve that time. The player can also shoot and destroy targets for points. The player can also replenish ammunition by running over pickups. Once the player reaches the end of the level they will hit a button. This button ends the level, provides statistics and gives the user an option to restart the level.

# **1 Introduction**

## ***1.1 Background***

I have always been passionate about video games so it was natural that I would create one for my project. Some of my favorite games include Faster Than Light, Civilization and Homeworld. I hope to create a game that emulates several of the more interesting features of these games.

## ***1.2 Technologies***

I used the Unreal Engine to create my project. I used Blueprints for scripting.

## **2 System**

### **2.1 Requirements**

#### **2.1.1 Functional requirements**

1. The game must provide a level for the user to navigate.
2. The game must have weapons available to fire.
3. The game must keep track of level time
4. The game must keep track of the player's ammunition.

#### **2.1.2 Data requirements**

The requirement is for storing data about the current game state (number of targets hit, amount of ammunition left, how long the level has taken etc.)

#### **2.1.3 User requirements**

The user needs a keyboard and mouse to run the game

#### **2.1.4 Environmental requirements**

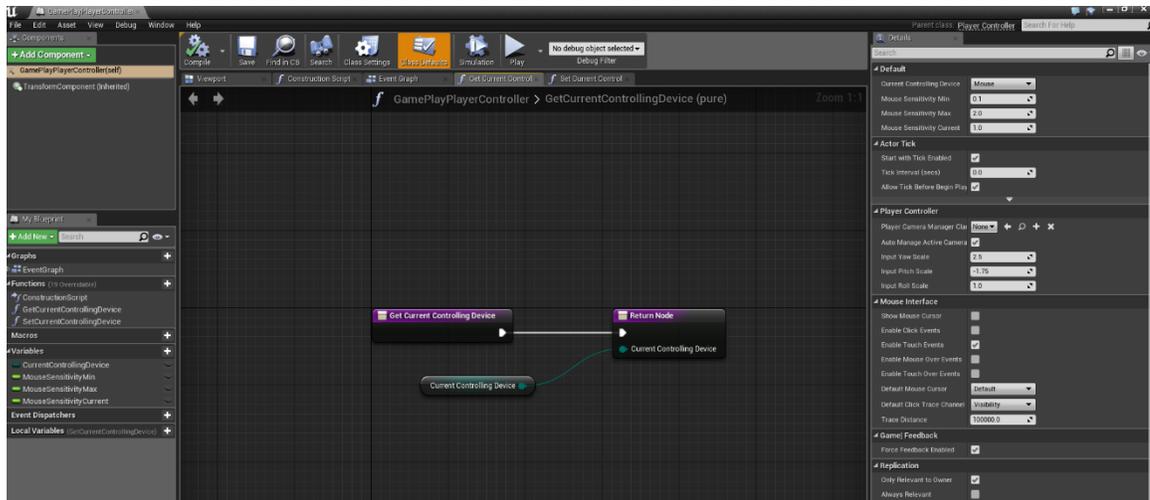
A computer with Windows or Linux operating system is required to run the game

#### **2.1.5 Usability requirements**

The game will have a user interface that is intuitive and easy to use.

### **2.2 Design and Architecture**

The game was built using the Unreal Engine. Development of scripts was aided using BluePrints. An example of the early development process:



This allowed me to create classes with a good amount of scripting in them. Additional features or scripts can be added quite easily.

### 3 Implementation

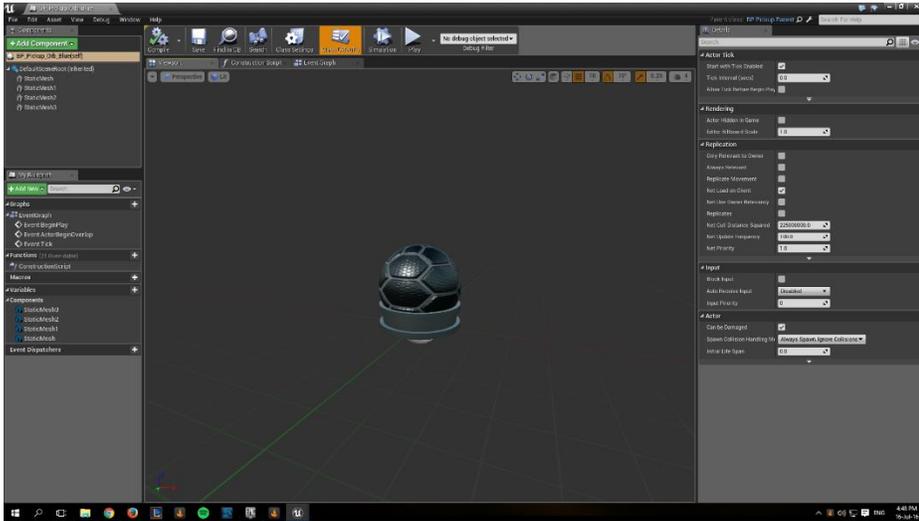
The level as seen from above. The player must navigate this level as quickly as possible.



The user interface. The player's current time is displayed in the top right corner, while the ammunition is in the bottom left.



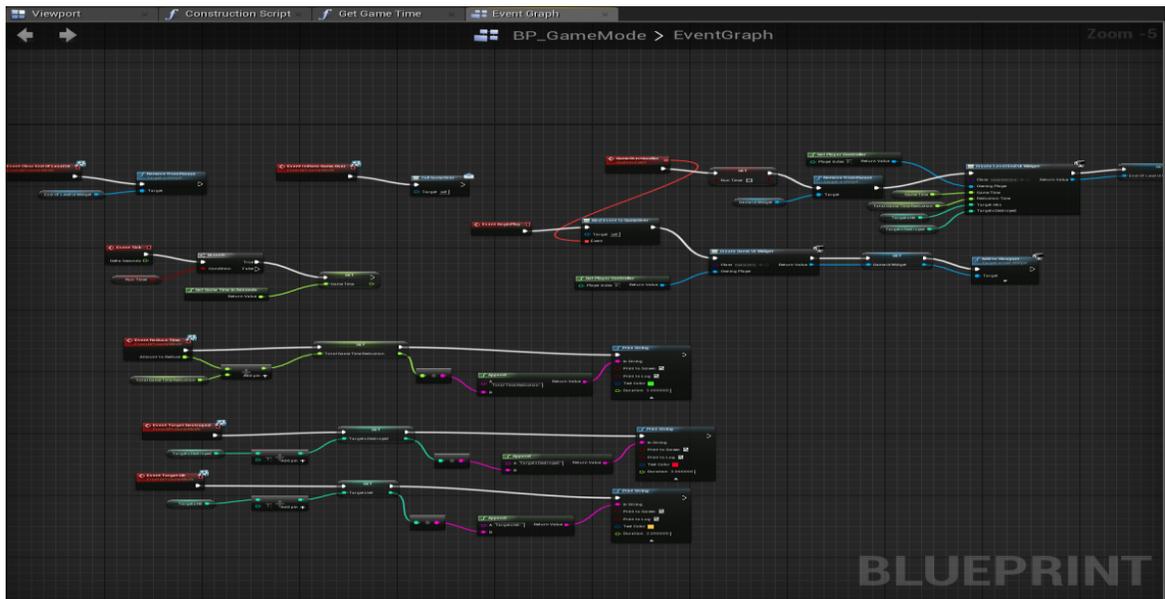
An early iteration of a pickup. This would be replaced by the ammo box



The end screen. This displays your statistics for the game and also gives you the option of restarting.



An example of the game code. Here we can see the Blueprints system in action, showing the connections between the different aspects of the game.



## ***4 Testing***

To test the system, I presented the game to a number of people with no gaming experience. They found that the design of the game was intuitive, and that they could understand the goals of the game easily.

## ***5 Further Development***

There are a number of ways to improve and to expand the game. Firstly I would increase the size of the level and add more obstacles. I would then add more levels of differing sizes. Another feature I could add is the inclusion of enemies in the game.

## **6 Bibliography**

Funge, J.D. (2004) *Artificial intelligence for computer games: An introduction*.  
United States: A K Peters.

Tutorials used:

<http://shootertutorial.com/>

<https://www.youtube.com/watch?v=UlwthuWogQs>

[https://wiki.unrealengine.com/AI\\_Bot:\\_Blueprint\\_Scripting:\\_AI\\_Behavior\\_Tree\\_%26\\_NavMesh:\\_Part\\_1](https://wiki.unrealengine.com/AI_Bot:_Blueprint_Scripting:_AI_Behavior_Tree_%26_NavMesh:_Part_1)

<https://app.pluralsight.com/library/courses/first-person-shooter-unreal-engine-2074/description>

<https://app.pluralsight.com/library/courses/replayable-game-design-blueprint-unreal-engine-2106/description>