

**Department of Computer Science**

**BSc (Hons) Computer Science (with Option if appropriate)**

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3D game focusing on surviving and exploring different environments using unfamiliar survival techniques

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A report submitted in partial fulfilment of the requirements for the degree of

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# Abstract

This document is a template for the dissertation. It includes some guidance to help you write about your project. Use the styles that have been setup (Heading 1, Heading 2, Appendix 1, Appendix 2). If you do this, the table of contents can be automatically generated.

You are very welcome to adjust the styles, and change the template to suit your work. You can have different can have different headings, chapters, titles and structure

The abstract should contain a high level description of the project. You should cover:

* Overview of the Problem
* Approach
* Summary of the contribution and outcomes

Try to keep the abstract short, and certainly not more than about 300 words.

# Acknowledgements

This page is where you have the opportunity to give thanks to anyone, or anything that inspired or helped you with your project.

I certify that the work presented in the dissertation is my own unless referenced.

Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Total Words: 2005

# Table of Contents

Abstract i

Acknowledgements ii

Table of Contents iii

List of Tables iv

List of Figures v

1 Introduction 1

1.1 Aims and Objectives 1

1.1 Project Approach 2

1.2 Dissertation Outline 3

2 Background 4

2.1 Tables 4

2.2 Figures 4

3 Methodology (Or Approach) 6

4 Design ( Or What you did Part One) 7

5 Implementation (Or What you did Part Two) 8

6 Testing and Evaluation 10

7 Conclusions 11

7.1 Future Work 11

References 12

Appendix A Personal Reflection 13

A.1 Reflection on Project 13

A.2 Personal Reflection 13

Appendix B Appendices 14

B.1 More relevant material 14

# List of Tables

Table 1 - A risk analysis table 4

# List of Figures

Figure 1 – Number of participants hiking in the US from 2006 - 2018 8

# Introduction

## Aims and Objectives

The main aim of this project is to teach people a set of skills that are not common knowledge, that will allow them to survive in different environments. This will allow people to develop their skills and knowledge on survival techniques that they once did not know.

To showcase the priority of each objective I will list them in order from most important to least.

1. Research and identify relevant background literature that highlights the importance of knowing survival techniques and how they can be applied in situational scenarios.
2. With the use of a questionnaire, using the Likert scale, provide questions that will provide useful feedback that can be used to assess how interactive, educational, and visually pleasing the project is.
3. Obtain ethical approval using the BREO (Brunel Research Ethics Online) system so users that are involved in the project can give me feedback using the questionnaire provided to them.

Movies and other video games also give an unrealistic approach to surviving in certain environments. Documentaries on the other hand give a clear and realistic approach to survival and some also show a survivor’s experience who have their own stories to share on surviving out in the forest or adrift on the ocean such as the documentary of a man who records his journey of surviving alone for 50 days (Alone in The Wild, 2009). Although he does not explicitly teach you, the watcher can learn from the actions he takes. However, some documentaries and TV shows can be lengthy and uninteresting so this is where my project can make the experience of learning much more interactive and interesting. Video games such as “Don’t Starve” and “The Forest” are based on survival, however, they are very unrealistic when it comes to the mechanics of the game and do not provide useful information that the player can take outside of the game. There are also websites that provide very useful information such as “Wildwood Survival” (Walter Muma, 2016) that teach methods of survival that the regular person would not know. The website is very bland, and there is not much interactivity that would keep the user engaged.

My project is different as it will give real information to the user that they can take outside to the real world, and it will be much more realistic than other ideas out there when it comes down to the mechanics of the game. Education is key for my project, so everything the user does will reflect reality. Interactivity is very important, and that is where a video game overcomes reading, documentaries, TV shows and so on. Interactivity keeps user retention and gives users real-time feedback that other modes of education cannot do.

I will create an interactive video game, showcasing skills that are not common knowledge to the average person to teach them several techniques to help with surviving in different environments. This game should give players the confidence to apply these tactics in a real situation if one were to ever occur or at the very least give some guidance as to where to start when lost in a forest or the desert.

Here you should clearly define the overarching aim for your project. Usually, for a final year project, you will have a single aim.

You should then list, the necessary and complete set of objectives that you will need to achieve to satisfy the aim:

1. Undertake a relevant background study to identify existing work in the area, and to identify appropriate techniques which can be adopted to produce a solution in this project.
2. Identify an approach which, when executed, will give rise to results from which rigorous conclusions can be drawn.
3. Design and implement some software, or undertake a simulation, or business modeling exercise, or conduct some other kind of appropriate activity which will give rise to the results desired.
4. Tailor the generic objectives to make them relevant for your specific project. Generic aims and objectives will lead to low-grading, generic project.
5. Evaluate the results using an appropriate framework, or set of success criteria which are clearly related to the problem and stated aim.

## Project Approach

To start off with development of the game I will first need to do a considerable amount of research on different survival techniques that I could realistically implement into the game. I will also need to research the different environments I want to include in the game as for each environment, different techniques will need to be used. From this research, I will be able to derive the objectives for the game and therefore continue to setting up a plan on how to approach the implementation stage.

In terms of my methodology, I will be using an incremental approach and borrowing some methods from agile as it will allow me to create the minimum product first, and then add “richness” to the project by adding more and more features. There will be sprints, every 2 – 4 weeks, where I will work on a certain functionality of the game, mainly the most important ones first that need to be in the game. Later, if all the important mechanics/functionalities have been completed to a high standard, I can work on adding more additions to the game to make it more fleshed out. After all the sprint cycles have been complete, I should have a complete video game.

During the implementation stage I will be implementing survival techniques that I have researched online as well as adding interactive objects to keep the player engaged. Mechanics of the game will be down to earth allowing for more realistic gameplay. Tips and information on how to survive will be shown to player to add extra level of detail to the game which will be done through the game and in text form.

To organize and track my progress, I will be using Trello as it is a very useful way of tracking your progress and creating a checklist of things to do.

I will be using Unity as the software for producing my video game and my language of choice is C#. Unity has an asset store that offer free and paid assets that other developers can use which will help me cut development time by a reasonable amount, of course crediting the creator of the assets when using their work. My game will have to work on computers/laptops, and I will have to keep in mind that some people will have computers that are not as powerful as others. To have more people play my game, it will need to be accessible by even lower end computers.

To obtain assets for the game I will be using several websites that offer free to use assets that I can download and implement into my game. This is because creating assets will take too much time, which I could better spend on the development of the game. These websites include:

Unity Asset Store: <https://assetstore.unity.com/>

cgtrader: <https://www.cgtrader.com/>

Free3D: <https://free3d.com/>

ADD RELEVANT WEBSITES HERE AND REMOVE OTHERS IF NOT USING

Once the development of the game is complete, I will need to apply for ethical approval using the BREO (Brunel Research Ethics Online) as we are using human subjects for testing and will be using the five level Liker scale for the feedback. Due to the pandemic, I will be sending the exe file to users for testing and sending out a questionnaire I created on word.

Describe how the project will be undertaken. Remember that the way in which you conduct your project will dictate the nature of the results that you produce, and the corresponding conclusions you can draw from them. Therefore, it is important that your reader understands how you are going about your project from an early stage, so they can understand how to interpret your results.

## Dissertation Outline

Chapter 1: Introduction

Introducing the problem that the project is trying to answer as well as addressing the aims and objectives, project approach and ethical approval.

Chapter 2: Background

Gather research relating to the project that helps analyze the problem in more detail and create requirements from the readings.

Chapter 3: Methodology

Chapter 4: Design

Chapter 5: Implementation

Chapter 6: Testing & Evaluation

Chapter 7: Conclusion

# Background

## The need for knowledge of survival tactics

According to Travis W. Heggie and Tracey M. Heggie (2009) 12,00 operations had to be carried out involving 15,000+ visitors during the time periods of 2003 – 2006. We can cross reference this to the article written by Patrick McCarthy (2019) who discusses why people get lost, where the number one reason being wandering off the trail. It is quite common that people do get lost and most people do not think they will be in a situation where they need fight for their life. There are survival techniques that are very common such as creating fire by striking two sticks together or building a shelter out of sticks but there are other techniques that not many people do know but could potentially save their lives. These techniques include finding certain plants that indicate a water source is nearby, how to find food in the desert or how to purify contaminated water. Also, looking at the Travis W. Heggie and Tracey M. Heggie (2009) article, the victims are visitors in national parks meaning they would not be as prepared for a survival situation. The proper attire would be worn but a limited amount of food and water is expected.

Hiking is also becoming increasing popular in the US with the number of hikers increasing drastically from the years 2006 – 2018 according to Statista (2018). The table shows that in the year 2006, approximately 29.86 million people hiked during that year while in 2018, a total of 47.86 million people hiked. As hiking is becoming more and more popular, it is that more important that people learn survival tactics that they can apply in an emergency if one were to ever occur.

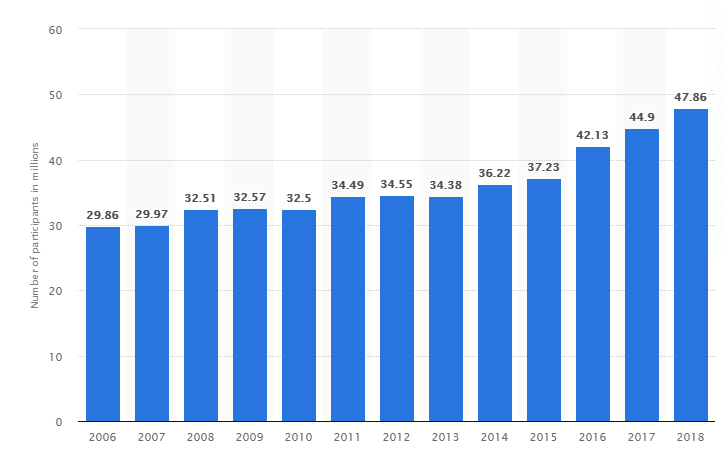


Figure 1 – Number of participants hiking in the US from 2006 - 2018.

## Realism in video games

Video games in recent times have been trying to become more realistic due to the advancement of technology in the gaming industry. Developers are able to make better looking games because of the increase of power in GPU’s and CPU’s allowing for a higher poly count in graphical design.

A book called “Entertainment Computing – ICEC 2004” (Wages, R., Grünvogel, S.M. and Grützmacher, B, 2004) touches on the topic of developers constraining themselves to the real world when they can do so much more. They also discuss how people are more immersed through simple art rather than highly realistic art (“Amplification Through Simplification”), where with more simpler drawings, you can amplify the meaning of the image such as the expression of a face, a certain action the character is doing and so on.

When it comes to making a game more realistic, it will take much more resources to produce the required graphics, as well as a more powerful computer to the run the game. Not everyone can afford a high-end computer that can run a high poly game the way it is meant to be run. This gives different players different experiences depending on their machine. To counteract this problem, it would be more suitable to develop a game that is low poly, so that both high-end and low-end computers can run the game, and both players will have the same experience.

Also, when confining to real world physics and law, it gives the developer less tools to work with in terms of creativity. The characters of the game will have to move, interact with objects, even talk as a normal person would. Although there is a following for games with realism, it could be uninteresting for many, as a lot of people play games to escape from reality and immerse themselves in another world.

# Methodology (Or Approach)

In research circles, this chapter would often be called the methodology. Basically, it is the chapter in which you describe how you are going to go about your project in order to achieve your Aims and Objectives. Are you going to gather requirements in a certain way, build some software, and measure the results of experiments? Are you going to develop simulation models which you will test with a set of expert users, or compare to existing data sets? Will you produce a mock-up of a system and test it with a number of users to ensure that the results are statistically significant.

Whatever you do that is relevant for your project, you need to convince your reader that the approach you are taking will give rise to a set of results that are unbiased, and from which you can draw objective conclusions.

# Design (Or What you did Part One)

These middle chapters are the places for you to write what you have done in more detail. This might mean the design, implement, test elements of a software project. It might mean the model, evaluate re-model phases of some kind of business modeling or simulation modeling project. It might be the data capture, requirements gathering, system design and mock-up test stages of an IS project trying to evaluate the feasibility of a software system to solve a particular problem.

You need to divide the material up amongst these middle chapters in a way that will make sense to your reader.

# Implementation (Or What you did Part Two)

We are following a seven chapter model, which gives you a couple of chapters in the middle for the “What you did” part, but if you really think it is better to have eight chapters, that is fine too. If you go for many fewer than seven, you have probably missed something, and if you have many more than seven, you may be going a bit fine-grained.

# Testing and Evaluation

This is where you will present your results and provide an evaluation of your solution against the problem. Try and structure your results in a meaningful way. Try and help the reader. Do not just take some numbers, load them into a statistics package such as SPSS and then present every statistical analysis technique in the known world. Use appropriate methods for analysing, presenting and summarising your data.

# Conclusions

This is where you draw your final conclusions. You have presented your findings or data, now summarise how you have met each objective, and draw a conclusion as to whether you have met your overall aim. You should provide some justification for this. There are three possibilities here:

1. You have completely met your aim, and solved your problem (unlikely)
2. Your results show that your solution does not solve the problem at all (unlikely)
3. You conclude that your solution addresses your problem to some extent, but that there are weaknesses in the approach in other regards (most likely)

In each case, you will have produced a valid result, and each of these is equally valuable when it comes to grading your work.

What is less valuable is drawing the conclusion that you have solved all the problems with only weak justification.

## Future Work

You should find that when you reach the end of your project, it will be defined more by what you haven’t had time to do, than what you have managed to do. If you engage properly with the process, you will continually raise questions, and spin-off projects which it would be interesting to explore, but which you simply did not have time to pursue while focusing on the primary aim of your FYP. This is your place to write about these areas as inspiration for future students.

# References

Heggie, T.W. and Heggie, T.M. (2009). Search and Rescue Trends Associated With Recreational Travel in US National Parks. *Journal of Travel Medicine*, [online] 16(1), pp.23–27. Available at: <https://academic.oup.com/jtm/article/16/1/23/1803249> [Accessed 20 Dec. 2020].

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Personal Reflection

This compulsory appendix should contain a personal reflection on your project. It should contain two sections:

Reflection on Project

In this section, you should reflect on the project you have undertaken, and consider, with you specific knowledge of the topic area, studies that you undertook, and problems you encountered, how you might have undertaken it differently.

Personal Reflection

In this section, you should consider more personally how you might have worked differently to deliver an improved project if you had your time again.

Appendices

More relevant material

The remaining appendices can contain relevant material which is not essential to be included in the main body of the dissertation, but which may be useful to support your dissertation.

* Examples of relevant material might include:
* Example questionnaires
* More detailed designs
* Relevant results which didn’t fit in the main body

Examples of material that should not go into an appendix:

* A dump of all your code
* Transcripts of all your interviews

Remember, that the appendices should be there in case the reader wants to refer to them. They will not be read as part of the dissertation story, so do not just use them to put essential material because you ran out of room. Also, do not be tempted to pad out your dissertation to the full 60 pages just by adding lots of unnecessary material to the appendices.

Any supplementary materials can be uploaded electronically with your submission.