**Winter Wonder – VR Multiplayer Survival**

By

**Filip Rusiecki**

Submitted to the Department of Computing  
in partial fulfilment of the requirements for the degree of  
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**Abstract**

The VR game genre became popular in recent years, slowly more and more people try to get their hands on VR technologies this allows users to plunge into virtual reality environment. The emergence of new and modern VR headsets such as HTC VIVE, Oculus Rift and many more stimulated the rapid VR development in the game industry in recent years.

On the other hand, Survival game genre has been on the market for a long while yet always brining something new to excite people and making the companies have competition on which survival game is better yet always surprising players by brining something different to the market. Some survival games after realising they end up doing a version of the game for a VR which always attracts new players. With my game being made in VR I want to bring my own game to a great standard that will have some new features that will make my game unique.

I chose to create this game in a game Engine that is very known and it is Unity game Engine, I will try to create a very optimised game that will run smoothly on any VR headset and I was also wanting to bring something new to that game genre.

Thesis Supervisor: Lei Shi  
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**Acknowledgments**

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**1. Introduction**

**1.1 Why VR project?**

The Project I have decided to pick and do is a VR Survival game.

**Why VR?** I have never worked with VR or never seen how that process is made. This project also was chosen because I wanted to learn about VR games as in spare time, I’m trying to develop games/ modifications for different games and releasing them online.

**Why Survival game for the first game in VR?** Having learning about game development I wanted to do something that would challenge me and at the same time educate me and something that would expand my knowledge. Making the Multiplayer for this game will be interesting and challenging.

The game will present the player with a cold environment in which they will have to survive and beat few goals of the game to complete it. In the game the user will face different puzzles and different Advanced AI that will try to stop the player from completing the goals. The players main goal is to fix a crashed plane that they will use to escape the dangerous area in which they are trapped in.

**How will this project challenge me?** This project will challenge me in several different ways. First one is that I never worked with VR technology. This will require me to research into the topic on how to create a project file from scratch to suit a specific VR set (HTC VIVE), Input system will be difficult and controlling of any object by the player.

Another challenge that I will face is creating advanced options and controls for the player and also AI that player will be facing against. The AI will need different edge cases not to get stuck or bugged out to provide the player with smooth gameplay.

A big challenge that I will face is the graphics of the game, as many VR games if not done correctly they can make the user feel motion sickness so I have to make sure that the graphics of the game or camera movement will not cause it. Also while creating a game I need to remember that the game is created for VR, that cant be overloaded with very high graphics in order to run smoothly without interruptions.

Another part of the project which I will find challenging to do is multiplayer as I also never really looked into making games for multiplayer using unity engine.

Implementing Unity Mirror Multiplayer can be challenging for game developers, especially for those who are new to multiplayer game development. The technology requires a solid understanding of networking, synchronization, and game optimization, which can be difficult to master. Game developers need to ensure that the game is optimized for multiplayer, and that the game logic is properly synchronized across all players. They also need to consider the potential for lag or network interruptions, which can affect the gameplay experience. However, with the right knowledge and expertise, implementing Unity Mirror Multiplayer can provide a highly rewarding multiplayer gaming experience.

**1.2 VR Technologies**