

GNG 1103  
**Design Project User and Product Manual**

**a World With Killer Robots**

Submitted by:

WALL-E With a Gun, Group 1

Alex Cotnam, 300353063

Holden Anderson, 300314681

Brayden Latimer, 300386502

Luke Colwell, 300372424

Arthur Bartholemew, 300371784

Dec 10, 2023

University of Ottawa

# Table of Contents

- [Table of Contents](#).....[ii](#)
  
- [List of Figures](#).....[iv](#)
  
- [List of Tables](#).....[v](#)
  
- [List of Acronyms and Glossary](#).....[vi](#)
  
- [1 Introduction](#).....[1](#)
  
- [2 Overview](#).....[2](#)
  - [2.1 Conventions](#).....[2](#)
  - [2.2 Cautions & Warnings](#).....[2](#)
  
- [3 Getting started](#).....[3](#)
  - [3.1 Set-up Considerations](#).....[3](#)
  - [3.2 User Access Considerations](#).....[3](#)
  - [3.3 Accessing the System](#).....[3](#)
  - [3.4 System Organization & Navigation](#).....[3](#)
  - [3.5 Exiting the System](#).....[3](#)
  
- [4 Using the System](#).....[4](#)
  - [4.1 <Given Function/Feature>](#).....[4](#)
    - [4.1.1 <Given Sub-Function/Sub-Feature>](#).....[4](#)

<u>5</u>	<u>Troubleshooting &amp; Support</u> .....	<u>5</u>
<u>5.1</u>	<u>Error Messages or Behaviors</u> .....	<u>5</u>
<u>5.2</u>	<u>Special Considerations</u> .....	<u>5</u>
<u>5.3</u>	<u>Maintenance</u> .....	<u>5</u>
<u>5.4</u>	<u>Support</u> .....	<u>5</u>
<u>6</u>	<u>Product Documentation</u> .....	<u>6</u>
<u>6.1</u>	<u>&lt;Subsystem 1 of prototype&gt;</u> .....	<u>6</u>
<u>6.1.1</u>	<u>BOM (Bill of Materials)</u> .....	<u>6</u>
<u>6.1.2</u>	<u>Equipment list</u> .....	<u>6</u>
<u>6.1.3</u>	<u>Instructions</u> .....	<u>6</u>
<u>6.2</u>	<u>Testing &amp; Validation</u> .....	<u>7</u>
<u>7</u>	<u>Conclusions and Recommendations for Future Work</u> .....	<u>8</u>
<u>8</u>	<u>Bibliography</u> .....	<u>9</u>
	<u>APPENDICES</u> .....	<u>10</u>
	<u>APPENDIX I: Design Files</u> .....	<u>10</u>
	<u>APPENDIX II: Other Appendices</u> .....	<u>11</u>

## List of Figures

Insert your list of figures here (right-click to update this field).

Figure 1. Title Screen

Figure 2. Initial AI Pathing interface

Figure 3. AI Pathing used in the VR environment.

Figure 4. Autonomous drone used in the environment.

Figure 5. Bird's eye view of the general environment

Figure 6. Perspective of the graffiti and boarded windows seen on the environment 1/2

Figure 7. Perspective of the graffiti and boarded windows seen on the environment 2/2

## List of Tables

[Table 1. Acronyms](#)   vii

[Table 2. Glossary](#)   vii

[Table 3. Referenced Documents](#)   10

## List of Acronyms and Glossary

**Table 1. Acronyms**

Acronym	Definition
NPC	Non-Player Character
VR	Virtual Reality
AI	Artificial Intelligence

**Table 2. Glossary**

Term	Acronym	Definition
POV	Point of View	The view with reference to a person or character
Killer Robot/Killer AI Robots		Autonomous robotic that specifically shoot or take the life of humans, without another humans' consultation.
IBRAIN		AI software that controls entity pathing, animation, and interactions through the free script provided.

Clipping		When two entities run in to each other and partially or completely go through one another. An example of this is when an NPC walks through a wall.

## 1 Introduction

Killer robots have been a controversial topic in the current geopolitical scene in the past years since AI technologies have become more and more prevalent in everyday tools and works. Though it has always been an idea, autonomous, unmanned weapons have never been an achievable technology. Now that they are, humanitarian groups and world leaders alike must ask whether the autonomous weapons are an ethical method of war.

Our team's mission has been to create a scene that can be interacted with and experienced that puts them in the POV of a warring state that uses killer robots to control its citizens and maintain order. This experience will place the user in a relatable, generic environment that they could imagine themselves or their loved ones being subject to living in regardless of background. Further, it demonstrates the actions both the government and civilian bodies take once this technology is implemented. This includes governments public announcements, boarded and tarped windows, graffitied billboards, and more signs of civil unrest. These aspects of the environment are all designed to subtly hint towards the greater environment and give the feel of what life is like in this reality at just a glance.

This User and Product Manual (UPM) provides the information necessary for Mines Action Canada, UN representatives, Government Officials, Militant Personal, Demilitarization groups, and anyone interested in the threat of killer roots being used in war to effectively use the

VR setup and for prototype documentation. This document is meant to serve as a description of the team's intention and as a guide if someone were to desire to re-create a work similar or identical to this. This manual will describe the design process the team went through, issues that we ran into, and

The document covers the tools and software used to produce it. The design process taken by the team, decisions made and roadblocks we ran into what someone using our formula may run into as well. Further, this document will instruct the user on how to use the product and the meaning behind each aspect of the product's architecture including any troubleshooting and fixes to common issues that may occur.

This product is not meant to be used to promote war or defame anyone, and is not designed to be a front against all form of AI, rather just the prospect of killer AI robots in the battlefields. It is an educational piece that provides a perspective of the potential outcomes that could result from the use of killer robots in war.

## 2 Overview

The main issue with killer robots is not that they can fulfill their function. Rather, people wonder if they will be able to complete its purpose of killing without harming innocents in disproportionate amounts. Concerns would be brought up through how much collateral damage is caused during wartime with these weapons, using the unmanned units as policing forces, discrimination based on age or race due to how the robot is trained, dehumanization of war, and accountability for warring bodies the killer robots commit unethical acts.

The user needs no background knowledge to use the environment other than basic knowledge of VR systems. To create the product, you would need basic coding knowledge, access to the unity software along with a basic background in unity or similar computer design software, \$50 CAD to spend, and the meta quest software (or equivalent software and corresponding VR headset) to convert to the VR format.

Our product makes use of audio queues in the environment that passively tell a story of a society that is under unrest, where the government needs to intervene and make public announcements and multimedia to make the newly implemented killer robots seem safer, rather than emotionless machines "they are your friends." The product also uses an environment that

feels like a continuous city outside the boundaries of the map. The environment was made so that anywhere you went in the map, it would look like you were in the middle of a bustling city.

### 2.0.1 Title Screen

The title screen is interactable in VR and acts as the first part of the experience for the user. It had 2 prototypes, used to build the interface, and to integrate it into the VR aspect of the environment.

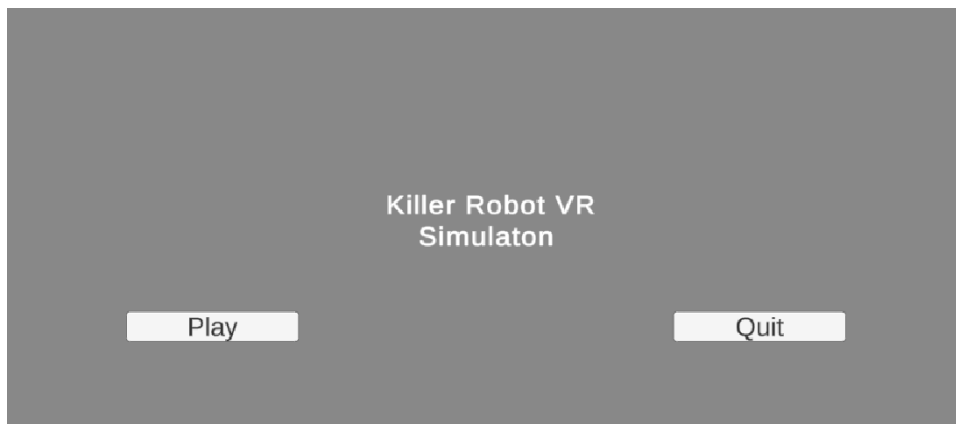


Figure 1.

### 2.0.2 Audio

Audio files were bought to simulate the sounds of a city to create a realistic and relatable atmosphere of a regular urban environment.

PA system was implemented to demonstrate the kinds of announcements the government would need to make in order to maintain civil unrest following the implementation of the killer robots.

### 2.0.3 AI Pathing



AI Pathing was used through IBRAIN to allow entities to walk from checkpoint to checkpoint while avoiding each other and solid objects.

Further, planes were implemented to allow the autonomous drones to move freely through the air at different levels to create the feel that the drones are real and have a presence in the square which the environment is set in.

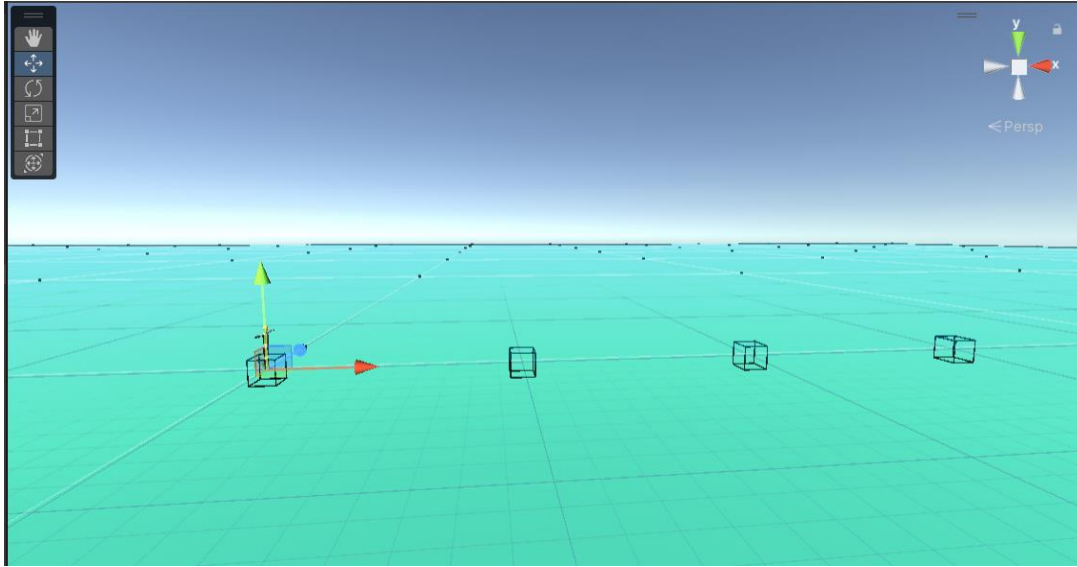


Figure 2.

#### 2.0.4 Model Animation

Entities were given commands to walk and avoid objects. This simple method lets the entities seem real, while not being so over complicated that it brings bugs and entity clipping while users view the experience.



Figure 3.

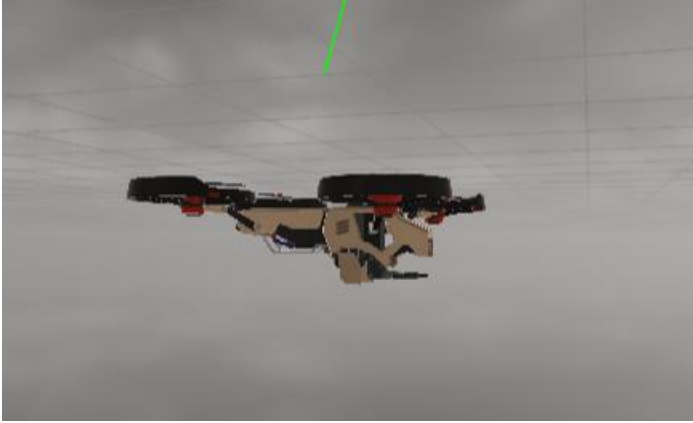


Figure 4.

2.0.5 General Environment

The general environment was designed to emulate a continuous city outside of the bounds of the traversable part of the map. This gives the feel of the user being placed in a bustling city that is adapting to the new implementation of autonomous weapons.

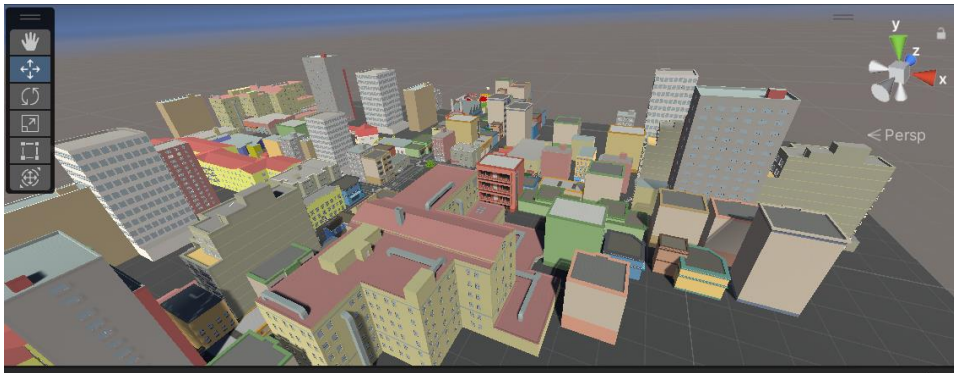


Figure 5.

### 2.0.6 Environment Realism

The environment is choked full of subtle hints regarding the government and civilian reaction to the presence of autonomous weapons. These include graffitied billboards about the autonomous weapons. Further, signs about the public's opinion of the weapons are sprinkled around the environment. For example, there are tarped and boarded windows due to people's general fear regarding the robots and their scanning properties.



Figure 6.



Figure 7.

The architecture of the environment uses prefabricated assets to build the global model. The experience makes use of a button to place the user into the scene facing a residential home with a poster condemning the use of killer robots. We used basic low poly entities that could blend into the environment and be a generic urban setting that anyone could relate to. Next, we implemented audio cues that were imported into the unity space to be listened to 5-10 seconds into the experience. This allows the user to be immersed into the environment, and then inform them of the current status quo of this fictional urban centre. Boards and tarps were custom made by using the free shapes provided by unity. To recreate them a rectangle would need to be resized and coloured, then copied and distributed across the map. Images for billboards were imported from images on the internet or ones that were custom made. To replicate this, you will have to get into your creative side, or use the examples provided in figure 6 and 7.

## 2.1 Conventions

The title screen will require the user to click on the start button to begin the experience.

The environment primarily allows the user to venture around freely and just view the environment. Otherwise, there are no real commands to be implemented for the user. This is a hands free, observable environment primarily.

The AI pathing of the environment used a walking animation for each of the humanoids and was straightforward in programming the path in which each entity took by placing path checkpoints for them to walk to and from.

## 2.2 Cautions & Warnings

When you are using the IBRAIN software, it will not simply program on its own. You need to modify the scripts slightly in order to get the entity to path where you want it to.

The Asset pack used by our group does not provide specific road pieces, that must be made by yourself. Make sure you prioritize building the roads and surrounding area first.

Make sure the assets used are colliding bodies and not rigid bodies. Rigid bodies will mess with the VR movement system and entity pathing.

This project will cost you around \$50 CAD if you are using the same products. Be sure to calculate the amount this is in USD plus GST in Ontario. We were lucky enough to do this at the beginning but could have ran into several production issues if our budget was not properly managed initially.

## 3 Getting started

1. Begin by installing the most up to date version of Unity on your computer, which can be found at [Start Your Creative Projects and Download the Unity Hub | Unity](#). Select the version for your operating system (select windows if using a windows O.S. etc.). Open the downloaded file under downloads in files, click run as administrator, follow the given download instructions.

## 1. Download the Unity Hub

Follow the instructions onscreen for guidance through the installation process and setup.

[Download for Windows](#)

[Download for Mac](#)

[Instructions for Linux](#)

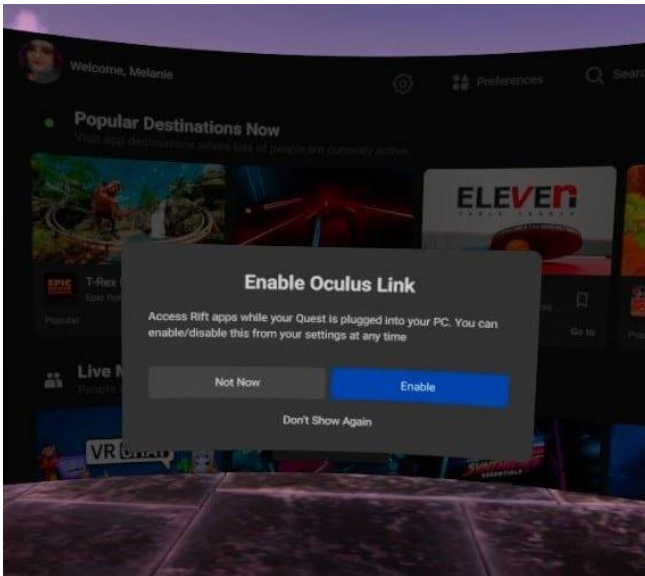
2. Download the project file from the Makerrepo link (found in appendix I).
3. Turn on the VR headset and sign into your account when prompted, if you do not have an account you will need to create one.
4. Plug the oculus end of the cable (right of image) into the oculus and the computer end (left of image) into the desired computer.



[Image Source](#)

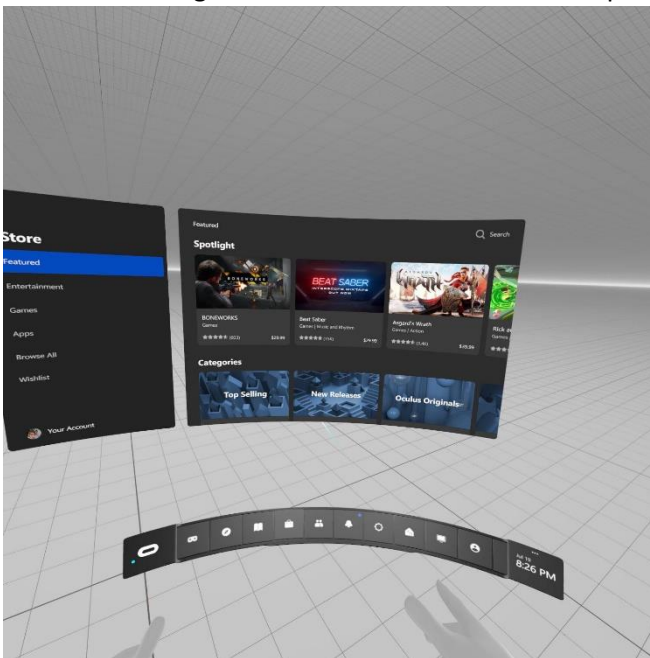
5. Put on the headset, you will be prompted to enable oculus link, click yes using a controller.





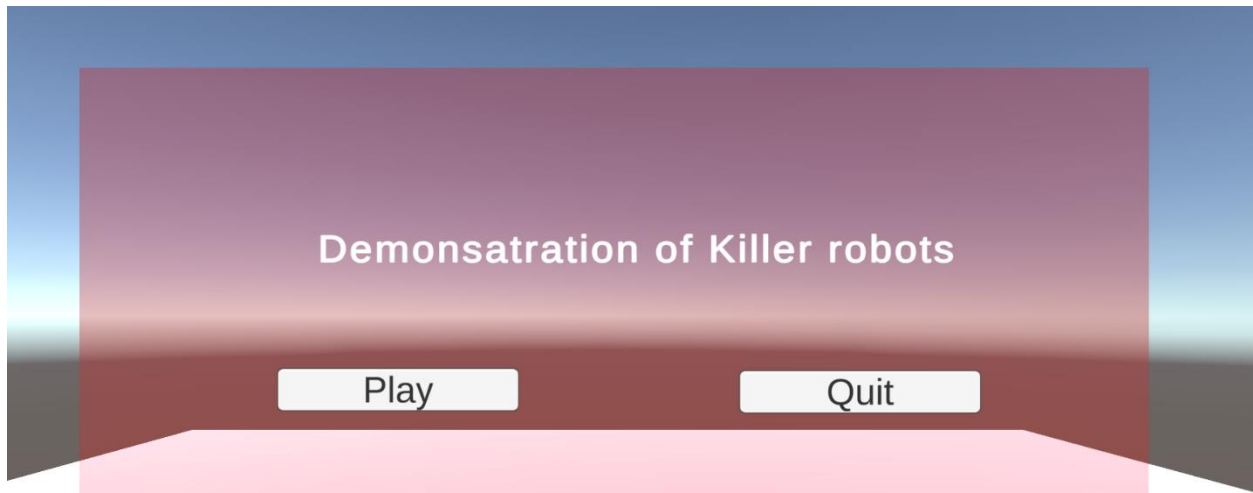
[Image Source](#)

6. You will be brought to a virtual room with a control panel in front of you.



[Image Source](#)

7. On your computer click open on the simulation file.
8. In the oculus virtual room on the grey control bar click on “open new window” and select the unity window of your computer, all of this is done in the virtual room with the oculus controllers.
9. The game should load, it may take time so don't panic if it doesn't open immediately. When it does click on “play” using the controllers



### **3.1 Configuration Considerations**

Install unity using the link in the above section (3.0)

### **3.2 User Access Considerations**

Almost anyone should be able to use this product, it should be noted that someone with visual or auditory impairments will lack a significant amount of the experience. It is not advisable for someone with epilepsy to use as the lights may trigger a seizure in someone prone to them. Prolonged use could cause motion sickness, comfortable use time will vary between users. VR technology is fragile, and all hardware should be treated with care, young children may be hazardous to such delicate technology. The expected target audiences for this device are people who will influence the decision to allow or ban autonyms weapons, such as members of parliament, members of the U.N.

### **3.3 Accessing/setting up the System**

Once downloaded from the Makerrepo link, open the file location, right click on the file and click run, the simulation should run as long as unity has been properly installed.

### **3.4 System Organization & Navigation**



The main menu is the only system interface of our product that the user should need to familiarize themselves with. There are two buttons, “play” which causes the simulation to begin when clicked, and “quite” which closes the application when clicked.

### 3.5 Exiting the System

Exiting the system is simple, just click exit in the main menu of the simulation, alternatively close the link application entirely or terminate the program from the computer.

## 4 Using the System

### 4.1 Title Screen

**Description:** Upon launching the game, users will be greeted with a title screen. The title screen will have two options: "Play" and "Quit." Users can navigate between these options using a VR controller or any other input method configured in Unity for VR.

#### Enter Game:

- **Input:** Users can activate the "Play" option by pointing the VR controller at it and pressing the trigger button (e.g., grip button).
- **Output:** Activating this option will transition the user from the title screen to the game environment.

#### Exit:

- **Input:** Users can activate the "Quit" option by pointing the VR controller at it and pressing the trigger button (e.g., grip button).
- **Output:** Activating this option will close the application and return the user to the desktop. There is no confirmation prompt to exit, as this is intentionally designed for a quick and seamless user experience.

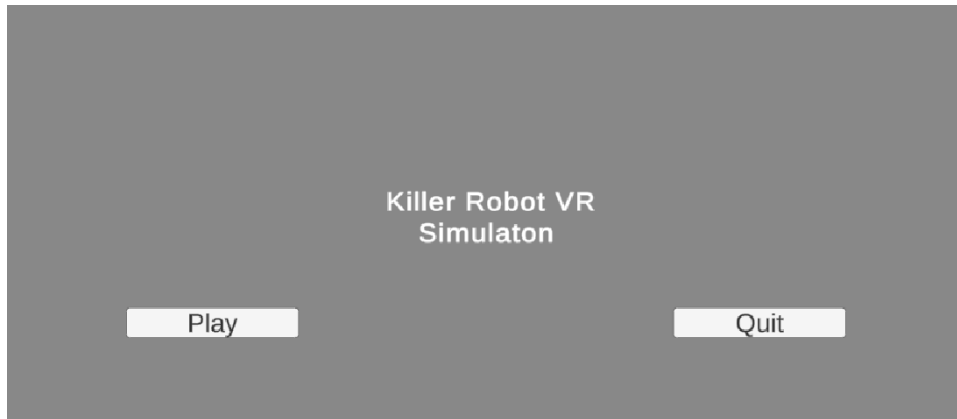


Figure 1.

## 4.2 Main Game Environment

**Description:** Once past the title screen, users find themselves in the main game environment. The environment consists of a cityscape with killer robots roaming around. Users can freely explore the area in VR.

### Input:

- Standard VR input controls:
- Head movement for looking around.
- Hand controllers for walking.

### Output:

- Visual: Real-time rendering of the 3D cityscape, killer robots, and environmental elements.
- Auditory: Dynamic sound effects like footsteps, distant robot noises, or city ambiance.

### Expected Behaviors:

- Users can explore the environment without any specific goals or objectives.
- Killer robots move autonomously, creating an ominous atmosphere.

### Special Instructions:

- No specific interactions are required in this mode. Users can simply enjoy the immersive experience.



Figure 8.

### 4.2.1 Killer Robot Behaviour

This sub-section explains the behavior of killer robots in the game environment.

#### Robot Movements:

- **Input:** No direct user input affects the robots; their movements are predefined.
- **Output:** Killer robots move autonomously within the environment, creating an atmosphere of danger and tension.

#### Interaction with Robots:

- **Input:** Users cannot interact with the killer robots.
- **Output:** The robots are purely part of the environment for atmospheric purposes; they do not respond to the user's presence.

## 4.3 Exiting the Game

**Description:** Exiting the game is intentionally designed to be straightforward, requiring the user to use a keyboard shortcut.

### Exit Game:

- **Input:** Users can exit the game by pressing both alt + F11 key on their computer keyboard.
- **Output:** The application will be closed, and the user will return to their desktop environment.

# 5 Troubleshooting & Support

## 5.1 Error Messages or Behaviors

If the problems persist, contact us.

- The Application opens and you cannot move.
  - FIX 1: Close and re-open the simulation.
  - FIX 2: Check the connection on the Oculus application.
  - FIX 3: Restart the VR Headset.
- Shadows covering the buildings.
  - FIX: Restart the Application.

## 5.2 Special Considerations

While troubleshooting check these considerations, for effective troubleshooting.

1. Restart VR headset.
2. In the Oculus application, in settings, in the general section, check off Unknown Sources
3. Confirm that the file you are opening is a shortcut to the Build.exe file or you are opening the Build.exe file.

## 5.3 Maintenance

1. Confirm the VR headset is updated to the most recent firmware update.
2. Keep the Oculus software updated.
3. If using the cable to link the computer to the headset; check the cable connectivity by checking that the Oculus application detects the headset. If the computer cannot detect the headset, replace the link cable, and try again.
  - a. It is also beneficial to make sure that the VR headset has cable link enabled to properly detect the game.
4. If using wireless technology to connect to a computer; confirm connection to the computer as a hotspot.
  - a. For this to work the power saving option should be turned off.
  - b. Inside the headset the option for cable link should be turned off and the option for wireless link should be selected.

## 5.4 Support

If you are having issues regarding the connectivity of the VR headset or with the Oculus application, visit [5.4.1 Meta and Oculus Support](#). Issues that involve the VR headset or the Oculus, usually involve connecting to the computer, or any errors that appear directly on the screen of the headset, or the Oculus display.

For issues regarding Unity visit the section [5.4.2 Unity Support](#). Issues regarding Unity are much harder to find, although if there are issues with the computer or VR headset not supporting Unity, this would be the place to go to.

For issues or questions regarding the simulation or the creation of the simulation visit the section [5.4.3 Contact Support](#). Issues regarding the simulation usually rely on the application not opening, or anything that involves the simulation.

### 5.4.1 Meta and Oculus Support

To troubleshoot the Meta Quest, visit <https://www.meta.com/help/quest/articles/fix-a-problem/troubleshoot-headsets-and-accessories/>.

For support in troubleshooting, visit <https://communityforums.atmeta.com/>, the community forums can help answer issues you may have while troubleshooting.

To contact Meta support, visit <https://www.meta.com/help/quest/>.

#### 5.4.2 Unity Support

To troubleshoot Unity, visit <https://docs.unity3d.com/Manual/TroubleShooting.html>.

For further troubleshooting support, visit the community forum <https://forum.unity.com/>, the community will help you with other problems you may have.

To contact Unity support, visit <https://support.unity.com/hc/en-us>.

#### 5.4.3 Contact Support

For any general support regarding the product itself please follow the link below to talk about any issues you have about the product or any question regarding the creation of the simulation: [https://makerepo.com/project\\_proposals/414](https://makerepo.com/project_proposals/414).

## 6 Product Documentation

### 6.1 <Subsystem 1 of prototype>

#### 6.1.1 BOM (Bill of Materials)

The Items and platforms used in this subsystem can be divided into Unity assets and software programs:

#### Comprehensive BOM List (Bill of Materials)

Item	Description	Cost (Dollar Figure CAD)	Link
Tinkercad	3-D modelling (software)	\$0.00	N/a
Wrike	Project management (software)	\$0.00	N/a
OnShape	3-D modelling (software)	\$0.00	N/a
Unity	Game design engine (software)	\$0.00	N/a
Blender	Graphic design (software)	\$0.00	N/a
NPC AI	Unity Asset	\$0.00	<a href="https://assetstore.unity.com/packages/tools/behavior-ai/ibrain-npc-character-a-i-116128">https://assetstore.unity.com/packages/tools/behavior-ai/ibrain-npc-character-a-i-116128</a>
Droll Robot	Unity Asset	\$8.00	<a href="https://assetstore.unity.com/packages/3d/characters/robots/droll-robot-02-241268">https://assetstore.unity.com/packages/3d/characters/robots/droll-robot-02-241268</a>
Ambient City Music	Unity Asset	\$5.00	<a href="https://assetstore.unity.com/packages/audio/ambient/urban/city-traffic-pack-4-morocco-181815">https://assetstore.unity.com/packages/audio/ambient/urban/city-traffic-pack-4-morocco-181815</a>
First-Person Controller	Unity Asset	\$0.00	<a href="https://assetstore.unity.com/packages/essentials/starterassets-firstperson-updates-in-new-charactercontroller-pac-196525">https://assetstore.unity.com/packages/essentials/starterassets-firstperson-updates-in-new-charactercontroller-pac-196525</a>

Low-Poly Human	Unity Asset	\$0.00	<a href="https://assetstore.unity.com/packages/3d/characters/humanoids/character-pack-lowpoly-free-221766">https://assetstore.unity.com/packages/3d/characters/humanoids/character-pack-lowpoly-free-221766</a>
City Alley Pack	Unity Asset	\$25.00	<a href="https://assetstore.unity.com/packages/3d/environments/urban/modular-city-alley-pack-65890">https://assetstore.unity.com/packages/3d/environments/urban/modular-city-alley-pack-65890</a>
Flying Drone	Unity Asset	\$5.00	<a href="https://assetstore.unity.com/packages/3d/vehicles/air/machine-gun-drone-96701">https://assetstore.unity.com/packages/3d/vehicles/air/machine-gun-drone-96701</a>
Dumpster	Unity Asset	\$0.00	<a href="https://assetstore.unity.com/packages/3d/props/industrial/dumpster-655">https://assetstore.unity.com/packages/3d/props/industrial/dumpster-655</a>

### 6.1.2 Equipment list

Hardware and Equipment List:

Meta Quest 2 - Virtual Reality Headset

Personal Computers (Laptops) - Used to create and run VR simulation

### 6.1.3 Instructions

#### Environment :

- Adjusted rigid body settings and plane layouts throughout the map to allow VR movements and smooth entity pathing.
- Added drone animations for smooth transition from place to place within the city.
- Tested the scene transition between the title screen and the actual interactive environment.
- Tested poster visibility with the headset on and how the environment works in tandem with the audio.
- Added drone bodies and a variety of NPCs bodies to the environment to create a realistic vibe to the environment.
- VR integrated into the environment.
- Environment adjusted for proper VR integration.

#### Entity Pathing:

- Added Drone animations to smoothly make drone entities move across the environment.
- Plenty of entities created to create a feel for the environment.



- Integration into the environment Audio
  - The background noise has been implemented, as well as the loudspeakers dialogue and the background gun shot.
  - We have assets for drone noises which can be added once the drone's movement has been fully implemented.
  - The next step for the audio will be to create a 3d effect for it so that sounds more realistic to the user.

### **Title Screen:**

- Title screen was created in a separate unity file with three primary scenes.
- The First scene, titled 'Menu' had three components: a title, a 'play' button, and a 'quit' button.
- Using a C# script, both buttons call upon a function that either loads scene 1 (play button) or exits the game (quit button).
- Buttons work with the scenes as expected, however the 'quit' button only functions once incorporated into the project.

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
using UnityEngine.SceneManagement;

public class Menu : MonoBehaviour
{
    public void OnPlayButton ()
    {
        SceneManager.LoadScene(1);
    }

    public void OnQuitButton ()
    {
        Application.Quit();
    }
}
```

- Code above must be added as a script for button functionality.

## **6.2 Testing & Validation**

Testing was conducted throughout the prototyping stages, mostly consisting of running the simulation to ensure that AI performed adequately, sound systems, and other components.

## 7 Conclusions and Recommendations for Future Work

In conclusion, the development of our Unity VR game centered around the theme of killer robots has been a valuable learning experience. Embracing a minimalist design philosophy, we successfully created a simple yet immersive environment where players navigate a world fraught with robotic threats. The emphasis on VR technology allowed for heightened immersion and engagement with the game's perilous atmosphere.

Time constraints prompted a focused approach, prioritizing essential features over intricate gameplay mechanics. A minimalist user interface was one of our key decisions to ensure an unobtrusive player experience.

Looking ahead, there are promising avenues for future work to enhance the game further. Suggestions include introducing interactive elements, refining enemy AI behaviors, expanding the game world, and incorporating sound effects and music for a more immersive atmosphere. The addition of a scoring system, objectives, and community feedback integration would contribute to a more dynamic and rewarding player experience.

Given more time, we would delve into narrative development, visual enhancements, compatibility with additional VR platforms, and the exploration of multiplayer features. Integrating leaderboards, achievements, and user customization options would contribute to a more well-rounded and captivating game.

In essence, with the proposed improvements and additional features, the game has the potential to evolve into a richer, more engaging experience. Acknowledging the lessons learned and building upon the existing foundation, future development teams can continue to refine and elevate the game, offering players a more comprehensive and enjoyable VR gaming experience.

## 8 Bibliography

Human Rights Watch. (n.d.). *Killer Robots*. Human Rights Watch. <https://www.hrw.org/topic/arms/killer-robots>

Technologies, U. (n.d.). *Build VR experiences with Unity*. Unity.com. <https://unity.com/solutions/vr>

*Stop Killer Robots*. (2018). Stopkillerrobots.org. <https://www.stopkillerrobots.org/>

Unity Technologies. (2019). *Unity*. Unity. <https://unity.com/>

Mines Action Canada. (2019). Mines Action Canada. <https://www.minesactioncanada.org/>





Technologies, U. (n.d.). *Unity - Manual: Unity User Manual (2019.3)*. Docs.unity3d.com. <https://docs.unity3d.com/>

Wikipedia Contributors. (2019, July 9). *Lethal autonomous weapon*. Wikipedia; Wikimedia Foundation. [https://en.wikipedia.org/wiki/Lethal\\_autonomous\\_weapon](https://en.wikipedia.org/wiki/Lethal_autonomous_weapon)

## APPENDICES

### 9 APPENDIX I: Design Files

**Table 3. Referenced Documents**

Document Name	Document Location and/or URL	Issuance Date
Project Download Page	<a href="#">GNG1103: Wall-e with a gun   MakerRepo</a> <a href="#">(makerepo.com)</a>	5 Dec, 2023
Initial Prototypes	 DeliverableF_InitialPrototypesandFurtherPlar	5 Nov, 2023
Second Set of Prototypes	 Deliverable_G_Group_1.pdf	12 Nov, 2023
Third Set of Prototypes	 DeliverableH.pdf	19 Nov, 2023
Cost Plan	 DeliverableE_Group_C-P1.pdf	29 Oct, 2023