# Project Deliverable D - Group 5

## Ideate: Conceptual Design

GNG1103-C01

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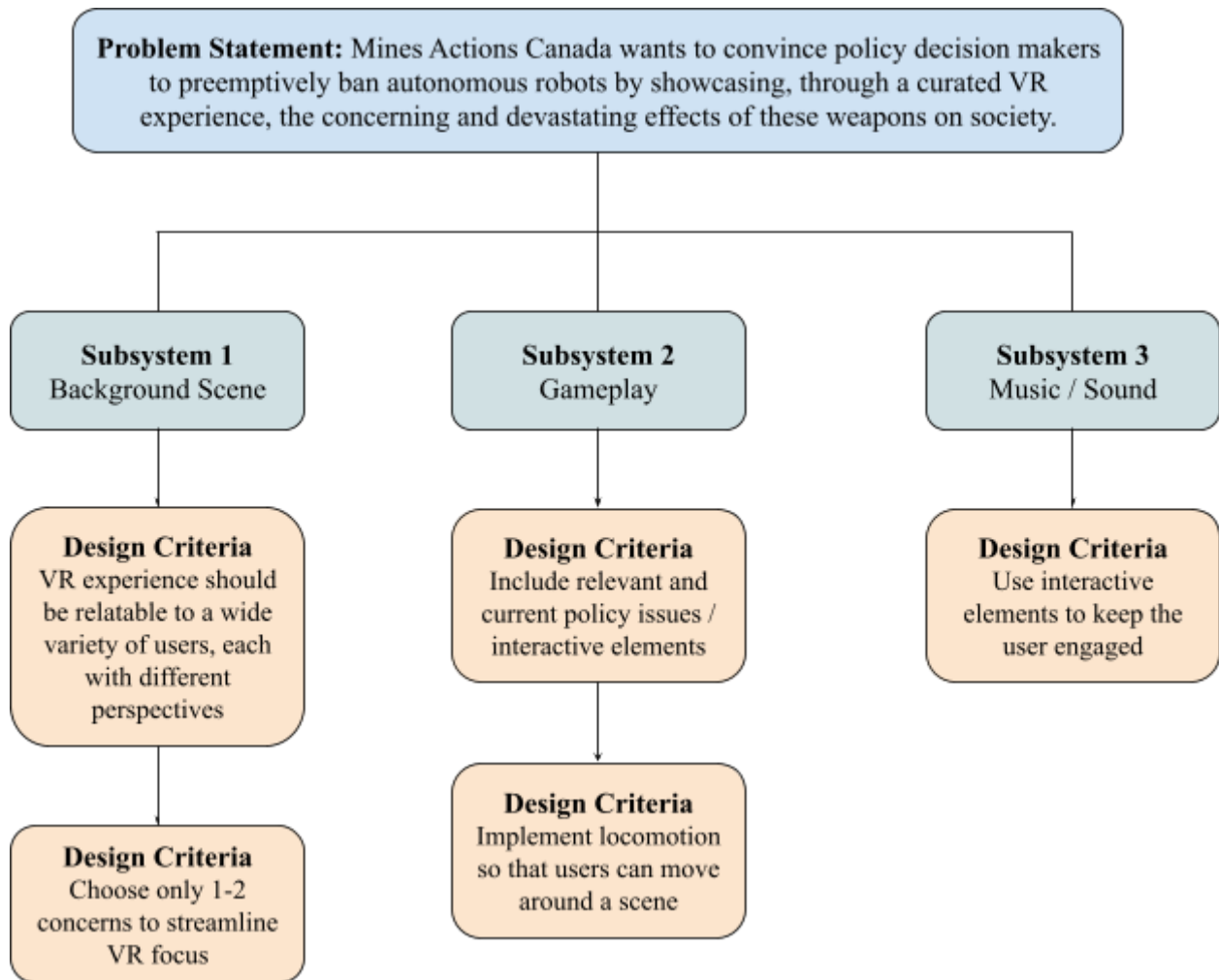Dev de Haan-Sharma 300339994

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# Introduction

With the final goal of designing a VR simulation used to discuss the consequences of developing autonomous killer robots, this report dissects the overarching project into three main subsystems. These are the Background and setting of the simulation, the audio and potential music playing throughout and finally the gameplay and plot. For each of these pieces, various ideas are proposed, evaluated and finally compared to ascertain which idea best aligns with the design criteria established beforehand. These criteria mostly relate to numerous content specifications, but still must consider the ramifications they may have on the technical specifications, and must fit in the realm of feasibility. Overall, this process will help find not only a convincing and emotionally poignant design, but one that can reasonably be built into a functional product.

**Problem Statement:** Mines Actions Canada wants to convince policy decision makers to preemptively ban autonomous robots by showcasing, through a curated VR experience, the concerning and devastating effects of these weapons on society.

| Subsystem 1 Background Scene | Subsystem 2 Gameplay | Subsystem 3 Music / Sound |
|---|---|---|
| **Design Criteria** VR experience should be relatable to a wide variety of users, each with different perspectives | **Design Criteria** Include relevant and current policy issues / interactive elements | **Design Criteria** Use interactive elements to keep the user engaged |
| **Design Criteria** Choose only 1-2 concerns to streamline VR focus | **Design Criteria** Implement locomotion so that users can move around a scene | |

# Subsystem 1- Background

Our first subsystem is the background of our game. This subsystem is the background environment of the game that the users play in but do not interact with. This is our first subsystem as it is constant throughout the whole experience and is what will help convey our intended message.

## Idea 1: Dev- Background
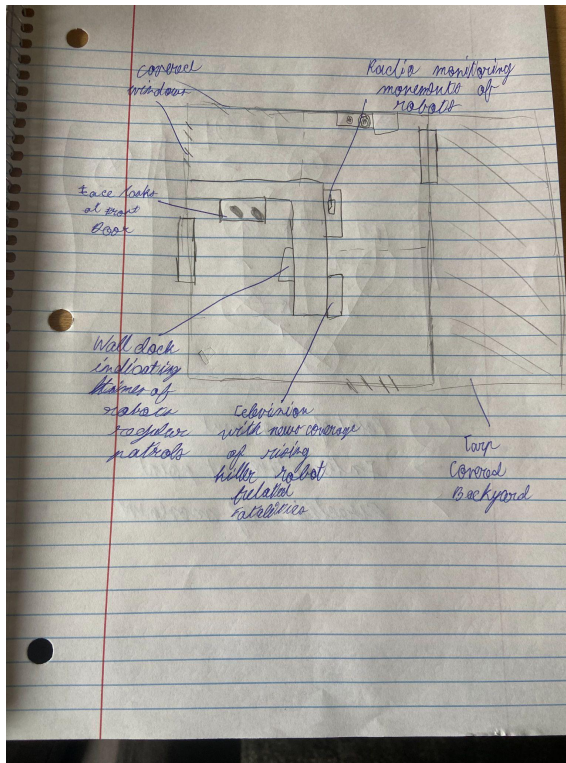


Focusing on the impact of killer robots on the everyday lives of civilians, my idea for the setting isolates the player within a typical and recognizable suburban home, with slight changes to demonstrate the impact of the robots. The key changes serve to discuss two main issues with the robots, their infringement on civilians rights to privacy and potential lethality. This concept considers the robots functioning in more of a policing capacity rather than as a military weapon. The main points of interest include the following.

- Face masks near the door to be used when outside
- A clock which shows the times of the robots patrols
- A television set showing the news coverage of rising robot linked fatalities
- A radio detailing the movements of the robots
- Barred windows
- A tarp covered backyard

## Idea 2: Ava- Background

My choice for the setting of the VR was a version of a downtown Toronto cityscape. This city showcases how the civilians have changed the way they live in order to ensure safety and security.
Some of the alterations included:

- Posters and billboards with warnings of the autonomous killer robots and how to protect yourself
- Destroyed buildings due to the weaponry of the robots
- Blacked Out and boarded up windows and doors

- Above and underground tunnels that allowed for safer travel between places
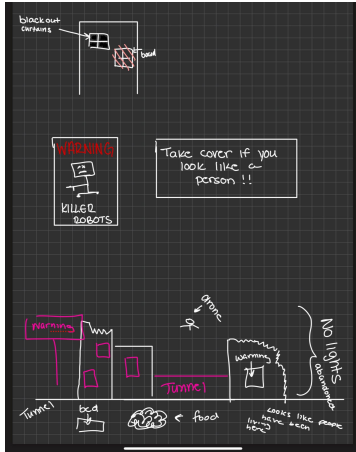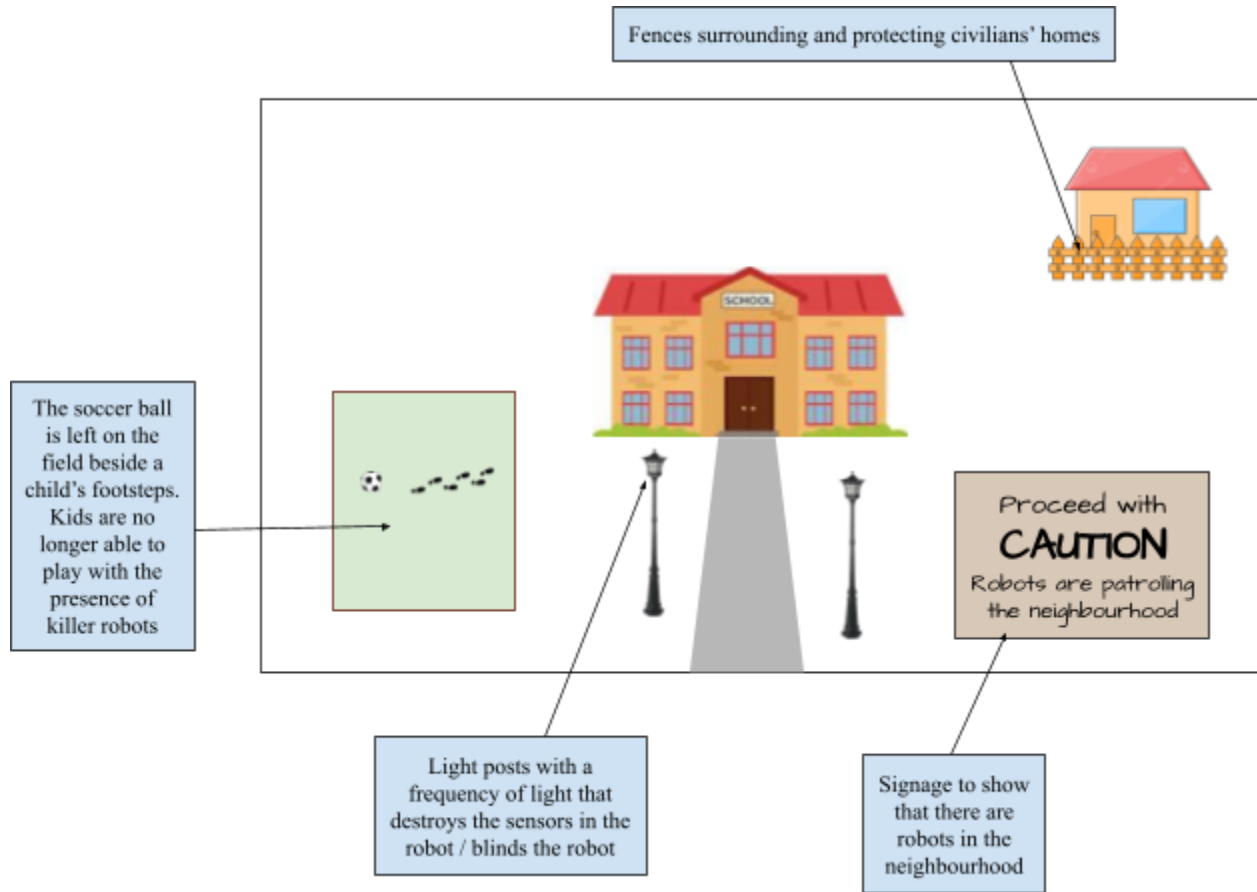


## Idea 3: Luca- Background



My choice of background is a typical suburban neighborhood with a few visible alterations made so the people who live in the neighborhood are able to live with the robots.

## Idea 4: Noor- Background

My proposed VR landscape is a typical neighborhood with some alterations that civilians would have made to make the area more habitable amidst robot patrollers/security guards.

     These include:

- Signage to warn newcomers about the presence of robots
- Some belongings are left on the floor with footsteps in the dirt beside them showing that the civilians were running away
- Fences built around each house
- Some sort of light attached everywhere that messes with the robot sensor such that it can no longer see the landscape; it is blinded by the light

Fences surrounding and protecting civilians' homes

The soccer ball is left on the field beside a child's footsteps. Kids are no longer able to play with the presence of killer robots

Proceed with CAUTION Robots are patrolling the neighbourhood

Light posts with a frequency of light that destroys the sensors in the robot / blinds the robot

Signage to show that there are robots in the neighbourhood

## Comparison of Ideas

|  | Pros | Cons |
|---|---|---|
| **Idea 1** | ● Relatable and recognizable<br>● Offers a more personal point of view | ● Involves more assets<br>● More difficult to develop<br>● Restricts the players ability to move freely within the simulation |
| **Idea 2** | ● Recognizable to users<br>● Set in present day which allows users to connect to the immersive experience | ● To broad of a landscape, makes it difficult to convey the message |
| **Idea 3** | ● Relatable to the majority of people<br>● Suburban life signifies present day which was one of our user needs<br>● Fairly simple to code or might already exist on the asset store | ● Boring<br>● Doesn't attract attention |
| **Idea 4** | ● Relatable to the majority of users<br>● Set in present times which will | ● Difficult to code the more intricate details and may take away from the |

| | Pros | Cons |
|---|---|---|
| | make the VR more realistic and more convincing | main message and project needs |
| | ● Small details show how civilians adapt to war-like, dangerous conditions | ● Too many details may make it hard for the user to understand the main message, making it less convincing |

# Subsystem 2- Sound/Music

Our second subsystem is sound/music. This subsystem encompasses everything the user will hear during the experience. We chose this as one of our subsystems because our benchmarking taught us that sound can be a very convincing tool.

## Idea 1: Dev- Sound/Music

Instead of any music, my simulation would mainly play ambient noise from the television and radio set which once interacted with would shift to clear audio. Furthermore, the initial and final moments of the simulation would have some plot guided sound. In the initial moments, the player would hear a mother recalling for her children to go back inside, as it's nearly time for the next patrol. This line would be provoked by interacting with the wall clock, which would show that it is two minutes until the patrol. Then, after reaching the end of the simulation the player will hear people rushing back inside, and the whirring of the robots beginning their patrol.

## Idea 2: Ava- Sound/Music

In the background of the simulation there would be an eerie/gloomy soundtrack that was played throughout the experience to give off the illusion of how these robots have negatively affected society. There would also be sound effects throughout such as when the camera is moving throughout the world there would be sounds of footprints. Distant robots and drones shooting and wandering about would also be incorporated into the experience.

## Idea 3: Luca- Sound/Music

I chose the song "Imagine" by John Lennon for the sound/music subsystem. The song imagine would be playing over the top of our simulation and would be the only sound the users would hear.

## Idea 4: Noor- Sound/Music

My sound effect choice centered around showing how having autonomous robots could lead to hacking and diversion of resources, which aligned with the client's concerns. Thus, at the end or beginning of the VR, I thought to include an error message showing that there was a security breach or that the robot had malfunctioned followed by subsequent gunshot effects.

## Comparison of Ideas

| | Pros | Cons |
|---|---|---|
| **Idea 1** | ● Adds to the story<br>● Interactive with the player | ● Requires voice acting<br>● Difficult to code interactivity |

| | | |
|---|---|---|
| | ● Furthers the emotional weight of the simulation | |
| **Idea 2** | ● Makes the experience feel more real<br>● Allows for the simulation to be more intriguing and captivating | ● May be too overwhelming and take away from the main objective<br>● The background audio may not allow for other sounds to be heard |
| **Idea 3** | ● Helps make our product more captivating and memorable because the song Imagine has high "music message congruency". Music message congruence is when the message of a song and video are the same. Music message congruency is shown to make videos more memorable.<br>● "Imagine" will help us convey the message of "concern but hope" which was one of our design criteria | ● Could be expensive and cause copyright issues<br>● Limits our audio options for storytelling |
| **Idea 4** | ● Communicates one of the specific concerns that the client brought up | ● May be out of place in the VR<br>● May not be feasible in Unity |

## Subsystem 3- Gameplay

Our third subsystem is gameplay. This subsystem contains the users ability to move and engage with our game and the story that we would like the user to follow. We chose this as one of our subsystems because we are aiming to make use of the VR's unique gameplay possibilities.

# Idea 1: Dev- Gameplay
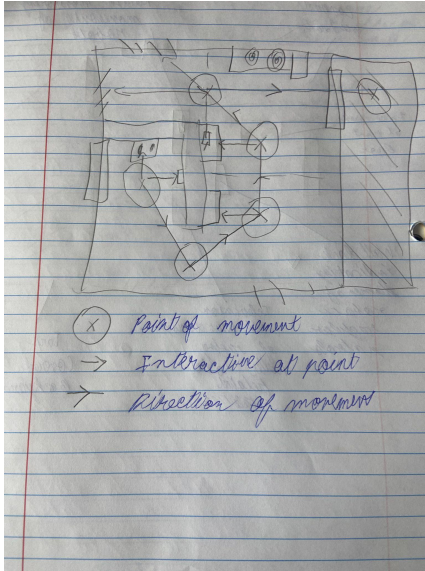


As opposed to a completely free movement system, my simulation would incorporate a "Point to move" system where the player can click on the designated spots to move there. The directional arrows simply designated the intended direction of movement, but the player would be completely free to move in any direction. Furthermore, the point of view would be capable of moving completely freely. The interactive elements would either provoke an animation or sound bite, such as in the case of the television, radio set or wall clock, while others would initiate a piece of dialogue from the players character, monologuing the purpose of the element as is the case for the barred windows, face masks, and the tarp over the yard.

# Idea 2: Ava- Gameplay

The gameplay would be a free movement simulation where the user would be able to walk around the world and interact with different aspects of the world through a first person perspective. The user would navigate through the tunnels and see how lives have developed in order for everyone in the society to stay safe. Near the end of the story the user would interact with the poster which would lead to distant sounds of shooting and robotic noises and finally cut to a warning about the dangers of autonomous robots and what may happen if we allow them to exist in society.
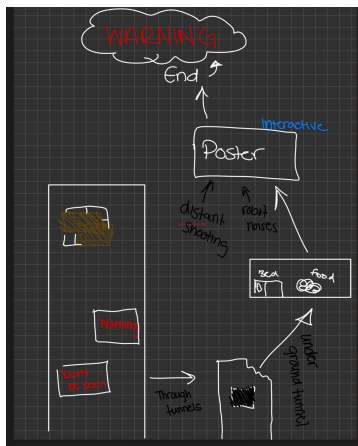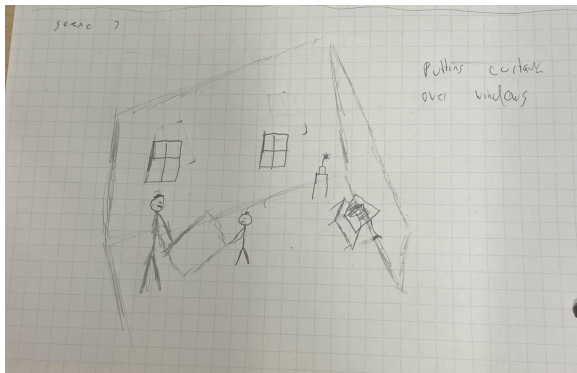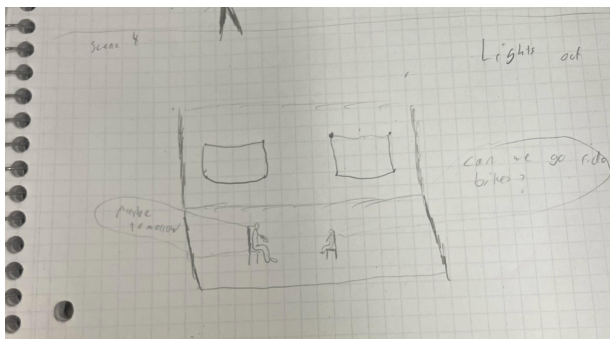
## Idea 3: Luca- Gameplay
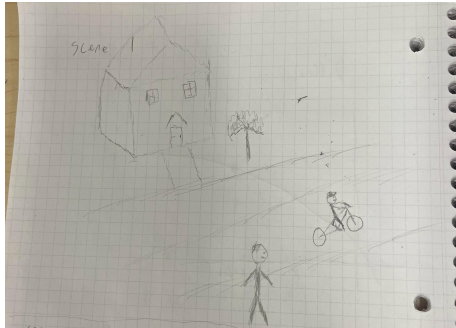


Scene 1- Child riding on their bike in the street being watched by a parents
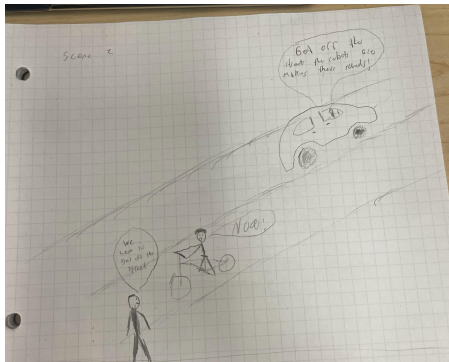


Scene 2- Car drives by and warns the parent and child that the robots are coming
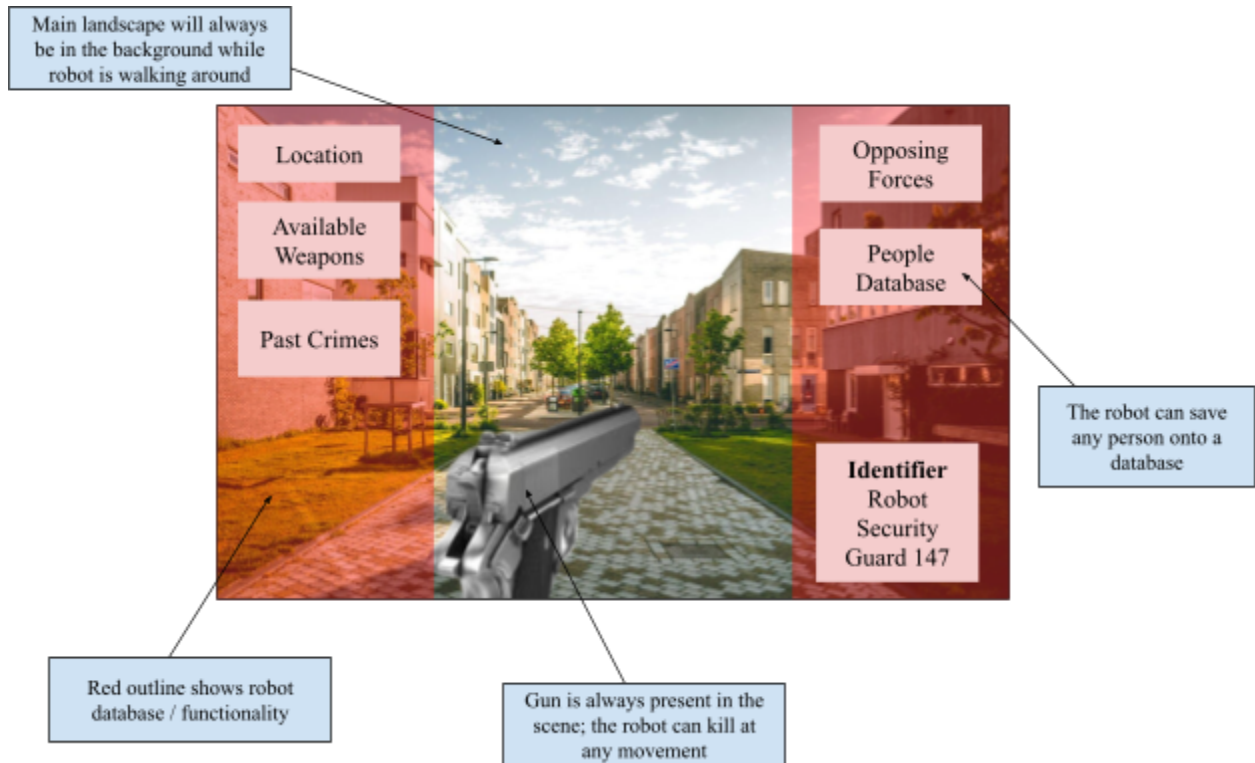


Scene 3- Child and parent have to set up the house to prevent a robot attack



Scene 4- Parent and child have to sit in the dark and the child is sad that they can no longer ride their bike

## Idea 4: Noor- Gameplay

The most important and unique part of the gameplay is that it would be in the POV of a robot security guard as opposed to a civilian to show how an autonomous killer robot may work and make decisions that the overall public and policy makers would not be in agreement with.



## Comparison of Ideas

| | Pros | Cons |
|---|---|---|
| **Idea 1** | <ul><li>Ensures the player follows the plot of the game</li><li>Exposes the character to every interactive element</li><li>Easier to use in the more confined environment</li></ul> | <ul><li>Complicated to code</li><li>Restricts independence of the player</li><li>Requires voice acting</li></ul> |
| **Idea 2** | <ul><li>Allows the user free will in the simulation</li><li>Portrays the effects of the autonomous killer robots and how they've affected society</li></ul> | <ul><li>Difficult to code</li><li>Too broad and may not get the message across in time</li></ul> |
| **Idea 3** | <ul><li>Emotional and convincing</li></ul> | <ul><li>Too complex</li></ul> |

| | | |
|---|---|---|
| | • Shows what a world with killer robots would be like for everyday people<br>• Relatable | • Too ambitious<br>• Would be difficult to tell whole story in 30 seconds |
| **Idea 4** | • Eliminates the need to build and show an actual killer robot which one may be tempted to do<br>• The robot POV actually ends up showing the landscape and how civilians have reacted to the presence of these security guards<br>• The VR set up lends itself very well to having a "security guard" patrolling a neighborhood | • Requires us to show some of the functionality of the robot so it may be harder to remain realistic and will take a lot more time<br>• We need it to be evident that the main VR user is in the position of the autonomous killer robot which may require additional details, code, and design |

## Decision Matrix

The design criteria from the previous deliverables have been split for each of the subsystems. All ideas generated for background design, music and sound effects, and gameplay are compared against the design criteria below. The ideas are rated from 1 to 5 based on how well they align with the design criteria. This value is multiplied with the relative importance of each criteria then used to generate a total value. Higher totals more closely address client needs.

### Subsystem 1

| | VR experience should be relatable to a wide variety of users, each with different perspectives (5) | Choose only 1-2 concerns to streamline VR focus (4) | Total |
|---|---|---|---|
| **Idea 1** | 3 | 4 | 31 |
| **Idea 2** | 3 | 3 | 30 |
| **Idea 3** | 4 | 4 | **36** |
| **Idea 4** | 3 | 3 | 27 |

### Subsystem 2

| | Use interactive elements to keep the user engaged (3) | Total |
|---|---|---|
| **Idea 1** | 5 | **15** |
| **Idea 2** | 4 | 12 |

| | | |
|---|---|---|
| **Idea 3** | 4 | 12 |
| **Idea 4** | 4 | 12 |

## Subsystem 3

| | Include relevant and current policy issues / interactive elements (5) | Implement locomotion so that users can move around a scene (4) | **Total** |
|---|---|---|---|
| **Idea 1** | 4 | 4 | 36 |
| **Idea 2** | 3 | 5 | 35 |
| **Idea 3** | 3 | 5 | 35 |
| **Idea 4** | 5 | 5 | **45** |

# Final Outline

Our final outline consists of the best option from each subsystem. We determined what the best idea from each subsystem was by seeing what idea best aligned with our design criteria.

## Final Background

We chose the suburban neighborhood as our final background because it is the subsystem that meets the largest number of design criteria.

**Pros**
- Relatable to the majority of people
- Suburban life signifies present day which was one of our user needs
- Fairly simple to code or might already exist on the asset store
- Meets the design criteria of simplicity and captivating
- The simplicity of the background allows our gameplay to tell a more convincing story because the user will not be distracted by a complex background
- The suburban neighbourhood background will be the foundation of our story and will allow the gameplay to tell a convincing story that has a message of concern and hope which are two of our design criteria

**Cons**
- Boring
- Doesn't attract attention

## Final Sound/Music

The final decision on sound and music was to simply have sound bites played when the user interacted with certain objects instead of using a background song. The sound would also follow a storyline where we start off with the user interacting with an object and the story would commence with sound bites and a voice over. Once at the end of the simulation there would be another interactive bit which would end the storyline with more voice overs and sound bites.

## Final Gameplay

Based on the decision matrix and discussions as a group, we decided that our final gameplay would include the robot POV because it best tells a story that could convince decision makers to preemptively ban autonomous killer robots due to their disastrous effects. Having this unique POV also creatively communicates the idea that killer robots are affecting the civilians without actually having to include a robot in the VR. Furthermore, it is a way to integrate locomotion in the VR that would simultaneously be realistic. The main challenge would be creating a background that effectively communicates that the user is in the position of the killer robot and how the civilians have adjusted their surroundings due to the presence of these security guards.

## Final System - Storyboard

The user will play from the POV of the robot. They will know that they are playing as a robot because there will be a crosshair and other information on the screen which indicates that they are playing as a robot.

As the robot walks around, visual cues show how civilians have adjusted their surroundings due to the robot's presence
- Reinforced doors and windows
- Surveillance cameras on lampposts as civilians try to monitor their surroundings more closely
- Warning signs
- Hidden pathways through backyards
- The civilians quickly close curtains and blinds when they enter their homes
- General sense of unease; they are distrustful of robot's surveillance
- Overgrown vegetation to hinder the robot's movements

Doors are slammed shut, civilians may be watching the robot from their windows or from behind curtains but the robot's sensors detect this.

## Storyboard example
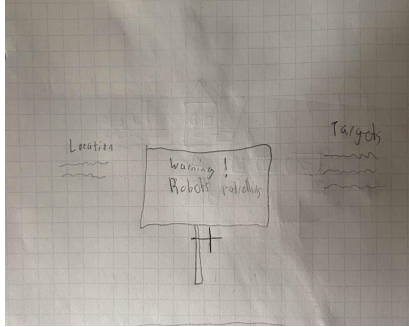
The user will see a warning sign that says "WARNING! ROBOTS PATROLLING". They will know that they are seeing the world from the POV of the robot because of the crosshair, target list and location tab which will stay on screen at all times.
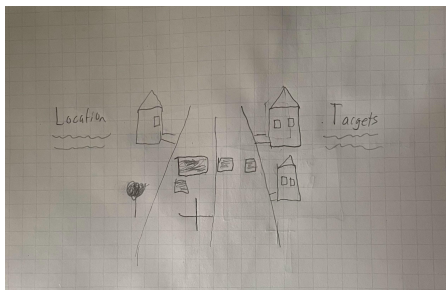


As the user progresses through the world they will come upon a street that is barred off with cinder blocks to try to prevent the robots from entering the street.
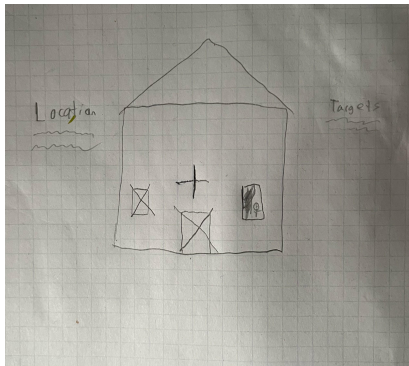


Once the houses on the street are more in view it will become visible that the windows are either boarded up or have the curtains drawn. In this image you can see a little kid peering out of the window to see if the robots have made their rounds yet.

## Image of final system
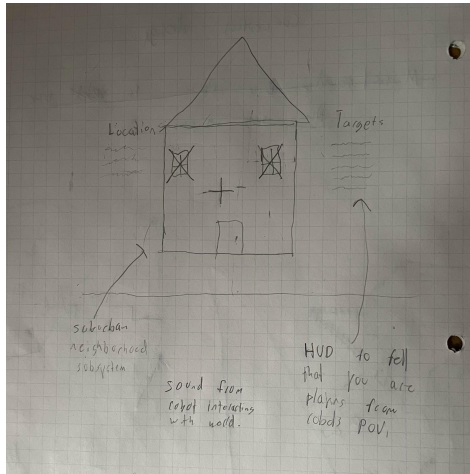


This image shows all of our subsystem choices. The suburban background is shown, the robot HUD is shown to show the user that they are playing as a robot and the sound is described.

## Conclusion

This report shows our process for picking the system we will move forward with and present to the client next week. The final system we decided on is comprised of the best idea from our 3 subsystems. We ended up picking the suburban neighborhood for the background, the users will play from the robots POV for the story and there will be no music, only the sounds of the robot interacting with the world. We made these choices because they best aligned with our design criteria.

## Wrike link

https://www.wrike.com/frontend/ganttchart/index.html?snapshotId=kqwHq0mN5qDPnGMhHRxQInVKq
JcdCzkq%7CIE2DSNZVHA2DELSTGIYA