Conceptual Design

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1. Introduction

This document outlines the continuation of our team's efforts to create an emotionally resonant virtual reality experience regarding "killer robots" for Mines Action Canada. In this document, we will present conceptual designs for key subsystems, analyze their strengths and weaknesses, and select the most promising concepts that align best with our design criteria.

2. Conceptual Design Subsystems

2.1 - Environment and Surroundings

The setting and environment are critical components we want to emphasize. They play a vital role in enhancing the immersion and overall experience of the presentation, as they serve as great tools for unspoken and unwritten storytelling.

The environment and surroundings should resonate with the viewer, evoking a sense of realism and a connection through sympathy or relatability. They should be engaging without becoming overpowering, ensuring that they do not overshadow the central message.

This approach allows us to create a strong and well-thought-out story within the constraints of our allotted time. By striving to establish an immersive environment, we lay a strong foundation upon which to build our story.

2.2 - Visual Story and Human Adaptation due to Robots

The main purpose of this simulation is to show how life would change if killer robots were utilized. Therefore, the simulation must include the types of low-tech solutions citizens would come up with in order to protect themselves against killer robots flying or patrolling streets. It should also take the type of sensor data that the robots would use into consideration.

This portion of the design should remain simple, meaning it shouldn't include elaborate storylines or need to show the actual robots. It should also not include any gore or violence, and it should be as realistic as possible.

Interactivity is one of the most important aspects of our design because it will determine how the user will experience the VR environment. When concerning the user interactivity, we should consider the audio, how the user interacts with the system, language options and subtitles.

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3. Team member concepts for each subsystem

3.1 - Sami

3.1.1 - Environment

For our environment, it should be immersive and also grounded in reality. The location won't be based on a real-world location but should still feel familiar to the user. This means designing a space that resonates with elements and atmospheres that are similar to our everyday life here in Ottawa.

3.1.2 - Adaptations

The Robots use AI to navigate their surroundings and recognize who their targets are. The humane solution to this involves altering the environment or their attire designed to confound the AI recognition software employed by these robots. This implies that in their day-to-day lives, individuals may start wearing clothing and change the environment with the primary intent of confusing the robots.

3.1.3 - Interactivity

The user interactivity should be very minimal. The client wanted a simple and short experience, which means there shouldn't be too much interaction with the environment. The user should at least be able to change the language from English to French and be able to control audio. When interacting with the environment, the controls should be very simple and have a clear and comprehensive UI built for first-time VR users.

3.2 - Fatima

3.2.1 - Environment

The main build would be of a realistic near-future city and environment (North America or Europe); the environment will be familiar enough so that the user feels that it is, in fact, something that can become a reality rather than a far-fetched theorist fear.The colors involved in the killer robot-plagued city would be monotonous and/or induce a sense of discomfort.

3.2.2 - Adaptations

The most emphasized attributes of the project are that they need it to be simple, clear, and effective at delivering the message; thus, I chose to combine an equal amount of visual and audio aspects. The audio will mostly imply that someone is speaking rather

than showing the actual people to avoid any unnecessary complexity (except for maybe one character).

The simulation should show how people have adapted and changed themselves and their environment to exist/ survive in a land that incorporates these robots. For this, I have chosen to display a scene with a drone going through a city in search of something that would be able to give the user a clear visual idea of how things would evolve into a fearful and bleak existence. People won't be shown
almost at all
as opposed to the buildings.

So the first scene would begin within a home through the POV of a granddad at his desk calling a kid over. The kid would then say, "Just a second!" and we would now be transferred to be in the pov of what the kid sees, which is a view through the drone's camera. The drone would mostly be looking at the city, which is mostly empty because the people are hiding. The ones that do appear would be wearing masks to avoid being identified as a target by the robots. The drone is then sensed by one of the robots (this one will be a very simple one attached to one of the buildings), announcing the violation sensed. The people around the area would scream in panic and fear (thinking they were identified as the violator), and the drone would be shot down.

That is when we are transferred back to the pov of the granddad, who is now in distress over the announcement alarm going off in his home. He would get up furiously, saying, "Not again," and head towards the kid in the other room, kind of shouting, "What did you do!" the kid would just stand there scared and say, "I only wanted to find Mom." The house then stops the alarm and gives them the announcement that their privileges will be removed (which were basic human needs).
the power will then be cut off, and the granddad would just cover his face in his hands in defeat and despair saying "If only I…" and a flash or something to indicate a change would happen again now we are still seeing the environment through his pov but in his earlier years (we would know this by the specific jewelry or birthmark on his hands) he would mumble to himself still blurry visioned "what…" a distant calling now becomes clear that it was calling him "Mr A mr A are you ok?" His vision then clears up, and he quickly removes his hand from hovering over the "yes" button in the conference room displayed under the question "Are you in favour of developing (project name)?" to the option "No" the user then just confirms the choice and the screen turns white displaying a message to the user to inspire action.

3.2.3 - Interactivity

For the interactivity of the simulation, it must be as simple and easy as possible, so during the experience, there won't be things to interact with except for a few glowing objects that click on it or look at it directly (as in it being in the center so that when the next scene happens, they won't miss anything). This will lead to the next scene to happen. I will also include some occasional directional arrows to help the user find the next object that must be clicked on for the story to continue. The controls (the audio, brightness, how to interact with the objects, how to use the VR controllers) should be

easy with a hideable instruction box that opens at first to let the user know of the controls as well as where to find them later on, this way they know how to use the gear even without prior experience. As for the language option, it will pop up at the beginning so that the users know there is an option for either language before having to ask or look for it themselves. After language choice, another shorter warning will display (for example, "warning!: this simulation has epileptic inducing flashes!").

3.3 - Amanda

3.3.1 - Environment

The client wanted the simulation to be as realistic as possible, and since this VR environment will be shown to decision-makers, specifically those in government positions, I think we should make our environment a city with a government building in the center of it. For example, we can pick the location to be Ottawa since the layout of the city is recognizable throughout all of North America and most other cities around the world. Also, since Ottawa is the capital of Canada, it might have more of an impact when decision-makers see how this city could be altered due to killer robots. The client also wanted the simulation to take place in the present, so the general buildings and roads of the environment should look like they do now.

3.3.2 - Adaptations

In the VR environment, I think it's best to include as many changes as possible to show how heavily killer robots can change our day-to-day lives. For example, we can show discarded masks littered on the floor as people would use these to cover their identities from facial recognition. We can also include handmade or painted signs around the city or hung up on houses and buildings, which would warn the citizens of areas with killer robots around. We can also include tarps on the sides of streets, which citizens would have put up to protect themselves from robots targeting them. There may also be reflective material that people wear that is placed around the environment to disrupt sensors. Smoke or fog may also be used to disrupt the robot's visual sensors, and noise devices may be used to disrupt any audio sensors.

3.3.3 - Interactivity

In order to keep the VR simulation simple, I think we can have minimal interactivity in order to allow the users to observe the space around them. Including audio may be too complicated for us to implement, so instead, in order to include some descriptions of the environment, text bubbles can appear over certain elements once the user approaches them. This text should be in English and in French in order to reach a wider audience, especially since these are Canada's official languages, so government officials viewing the simulation would want to have both. In terms of interaction, I think it is best if the user is just able to walk around the space. If there are too many components of the space and the user won't be able to see everything within 60 seconds, then we can make them teleport to different regions to save time.

3.4 - Jordon

3.4.1 - Environment

In my personal opinion, the environment of the virtual experience should take place in an urban environment with no specific ties to any one nation. This portrays AI weapons as a global concern rather than a problem specific to one nation. An urban setting is of great importance as it is where most of the world's population resides, which hopefully makes the VR experience resonate with a larger audience.

An alternate location could be a location of great international importance, such as the Hague, Geneva, or the United Nations Assembly in New York. Historically, these are places where global issues are addressed. This emphasizes the idea that AI weapons should be addressed in the same way as the Geneva Convention was in the past, as they both have/had a great impact on the rules of warfare.

3.4.2 - Adaptations

I believe it is essential to include points that portray the detrimental impacts of AI weapons on the nations that use them by addressing moral and ethical concerns. For example, we could show that due to AI targeting and threat detection, civilians and soldiers start dressing similarly, making it harder to discern them as threats by AI. A realistic concern would be that civilians would eventually become casualties. The regular soldier would then also have a harder time discerning between combatants and civilians. A way to portray this would be putting the view in the POV of a civilian in a combat zone. They cannot decipher between fellow civilians, friendly soldiers and enemy soldiers as they all dress the same to limit the effectiveness of the AI weaponry and surveillance in the area. As a result, we could try to instill a feeling of paranoia by somehow portraying indiscriminate targeting or capture.

3.4.3 - Interactivity

In my opinion, keeping minimal user interaction enhances the overall simplicity of the experience. I believe that non-verbal storytelling should be the primary narrative driver. The user's control over perspective should be limited to just observation within the VR environment. Rather than embracing interactive gaming mechanics, I advocate for a virtual presentation approach, where events unfold around the user, immersing them in the narrative. This allows us to keep the experience within the allotted time of 60 seconds but compresses as much storytelling and narrative by not having to deal with different scenarios and waiting for user action.

3.5 - Mahmoud

3.5.1 - Environment

The environment that the VR will take place in should be in Canada, preferably Ottawa, as it is the capital, and that is where the company Mines Action Canada will appeal to the most, rendering it an attractive choice for the location of the immersive virtual reality venture. Moreover, it is imperative to select an infrastructure or environment that encourages interactions among a wide array of age groups, such as the parliament.

This ensures the broadest possible audience reach, which highlights the dangers across all age groups. This will resonate with the audience, evoking a sense of realism in the potential viewers.

3.5.2 - Adaptations

The beginning of the story should be at Parliament Hill, where killer robots are seen intimidating the people with their presence because everyone knows that at any moment, they could die in the presence of such robots, so the family feels uneasy whenever walking through the parliament. However, The simulation needs to show how people are coping with it and having to avoid doing certain things due to these killer robots. In addition, The outset of our narrative unfolds against the backdrop of Parliament Hill, where an ominous killer robot dominates the landscape. Its mere presence sends shivers down the spines of the residents as the knowledge of imminent danger hangs heavily in the air. A simple walk through the Parliament area becomes an unsettling experience, with families gripped by unease and anxiety. The core objective of our simulation is to portray how people adapt and navigate this environment, revealing the intricate strategies they employ to avoid falling victim to these killer robots. As the story progresses, the narrative focuses on a particular family, capturing the tension and unease that takes over their daily lives.

Mother: Kids, stay close. We can't be too careful with that thing around.

Father: I know it's nerve-wracking. We used to love coming here.

Child: Why is it always here, Mom?

Mother: Shh, don't talk too loud. We don't want it to hear us.

Grandfather: It's not just us. This whole city has changed.

[All characters are nodding with despair.]

We witness how they carefully plan their movements and routines, steering clear of certain activities that might draw the attention of the lethal machines. In one scene, we observe the family negotiating a path through the Parliament area; every step increases the feeling of uncertainty of survival as they might become targets of the robots. The father clutches his children close, the worry drilled deep into his face, while the mother maintains a vigilant watch over her parents, having her instincts on high alert. The scene changes to an illustration of the family eating dinner in distress.

Grandfather: This is a nightmare. We can't live like this.

[All characters are nodding with despair.]

Then, the window moves to show a question with two options, yes or no; a statement is shown: Do you wish this upon your children, parents, relatives, friends, and country?

Then it shows: Stand with us, Mines Action Canada (MAC), to ban autonomous killer robots.

3.5.3 - Interactivity

There will be little to no interaction as the viewer cannot interact with the environment; it is as if the view is third person pov. This allows the simulation to be as simple as possible, which was the primary constraint to the project.

4. Subsystem Categorization

1	2	3
Bad	Average	Good

4.1 - Environment

Specifications	Importance	Sami	Fatima	Amanda	Jordon	Mahmoud
Recognizable	3	3	2	1	3	2
Realistic	4	3	3	3	2	3
Simple	5	3	1	3	2	1
Aesthetic	1	2	3	1	2	2
References to real world	3	3	2	1	2	1
Total		47	31	34	35	26

4.2 - Adaptations

Specifications	Importance	Sami	Fatima	Amanda	Jordon	Mahmoud
Emotional	4	1	3	2	3	3
Realistic	4	3	3	3	3	2
Graphic	2	3	2	3	3	3
Simple	5	2	2	3	1	1
Total		32	38	41	35	31

4.3 - Interactivity

Specifications	Importance	Sami	Fatima	Amanda	Jordon	Mahmoud
Easy to use	5	3	2	1	3	3
Language	3	3	3	3	3	2
Health and Safety (flashing, motion)	4	1	3	2	2	3
Number of items on screen	2	3	3	2	2	2
Total		34	37	26	32	37

5. Functional Solutions

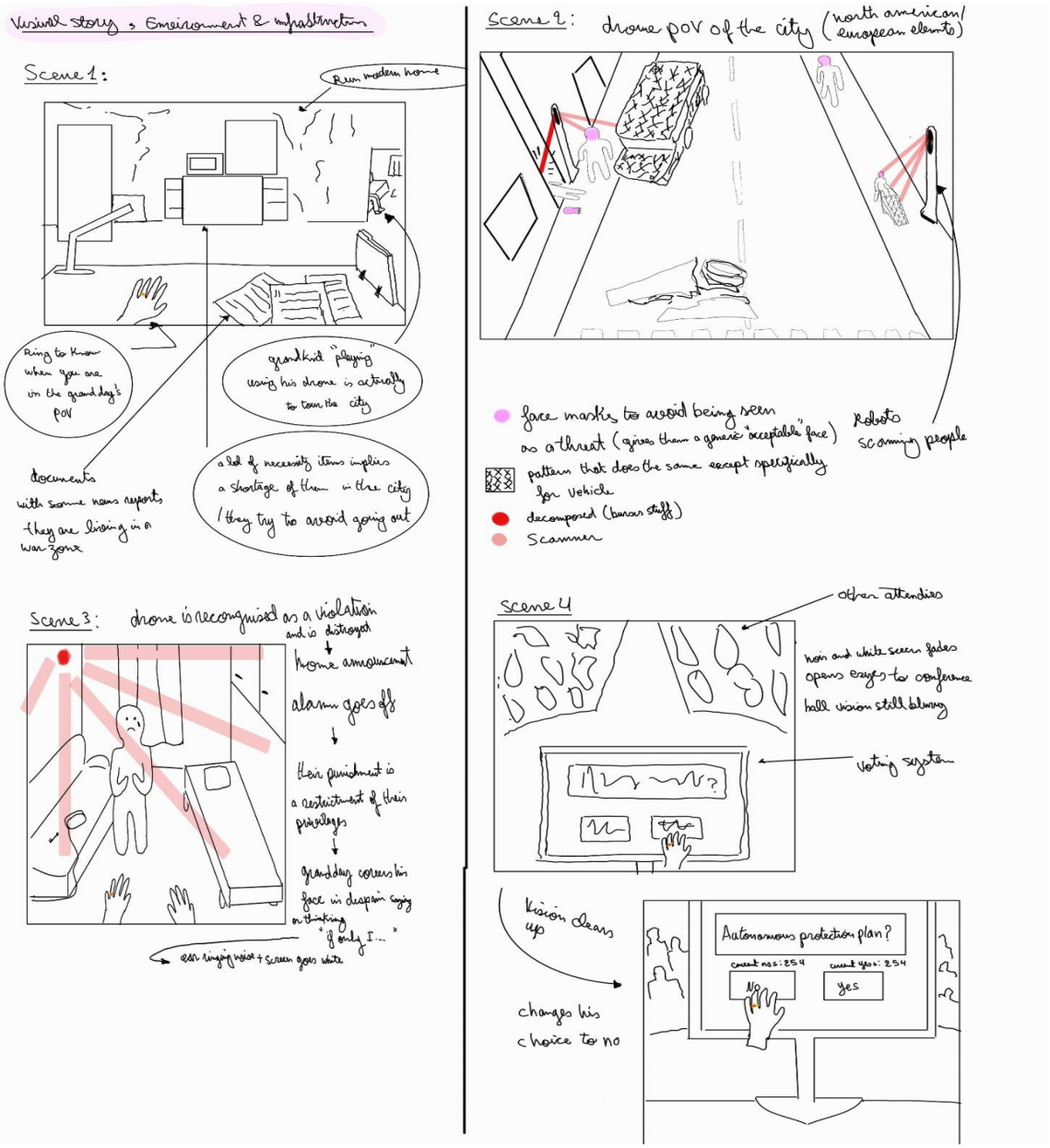
Out of the three subsystems, we chose to integrate all of our ideas to create a final functional solution. For the environment, we decided to stick to a city as this is most recognizable. We also decided to simplify the storylines so that the only description of how killer robots ended up taking over the city is shown through banners, signs, or newspapers laid out throughout the street. We are also trying to make the scene look like the beginning of a movie where no storyline is being shown. However, you can tell what is going on based on the scenery. Additionally, the user will be able to walk through the space and find different ways that life has changed in every corner they turn. The VR experience will also be easy to use with instructions at the start and will have a warning in case there is too much flash or motion.

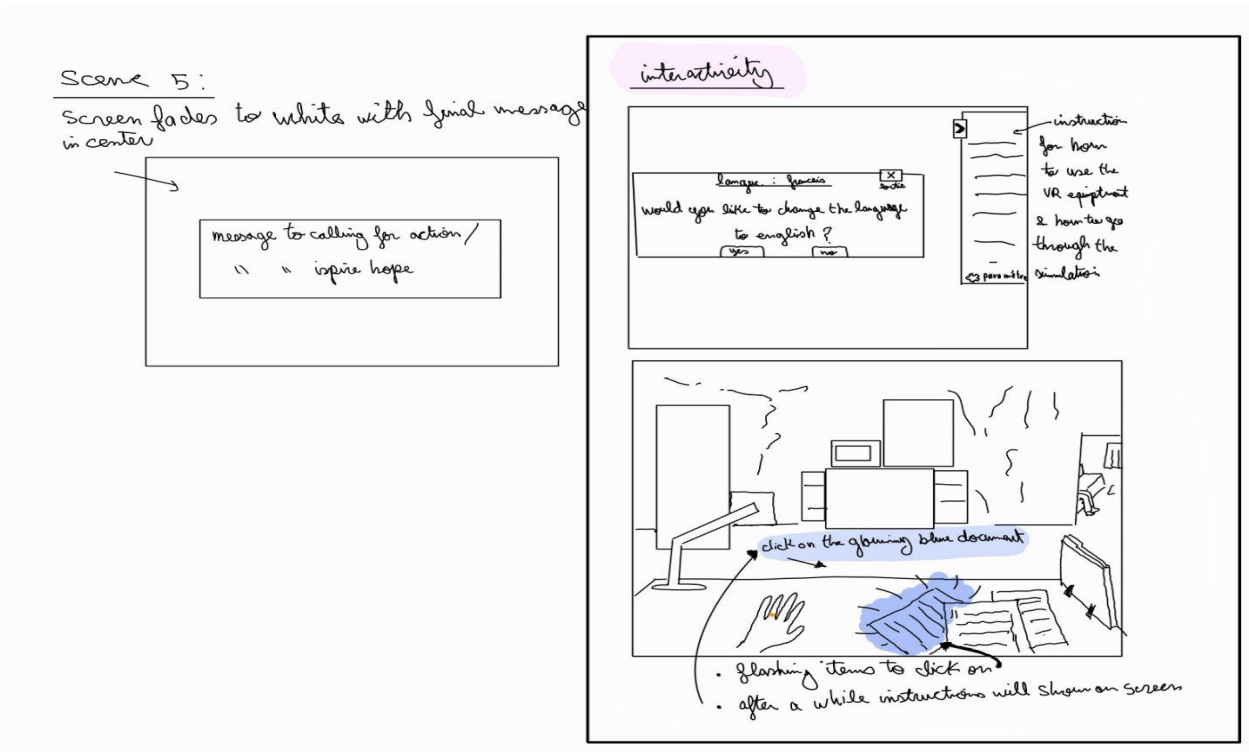
6. Conclusion

In conclusion, We had all accumulated and discussed our ideas, which allowed for an overview of what we are trying to go for in this project. In conclusion, We had all accumulated and discussed our ideas, which allowed for an overview of what we are trying to go for in this project. Our designs aimed to be both efficient and immersive, addressing the specific requirements we defined. While our design is not flawless, further discussions will lead to a more refined design.

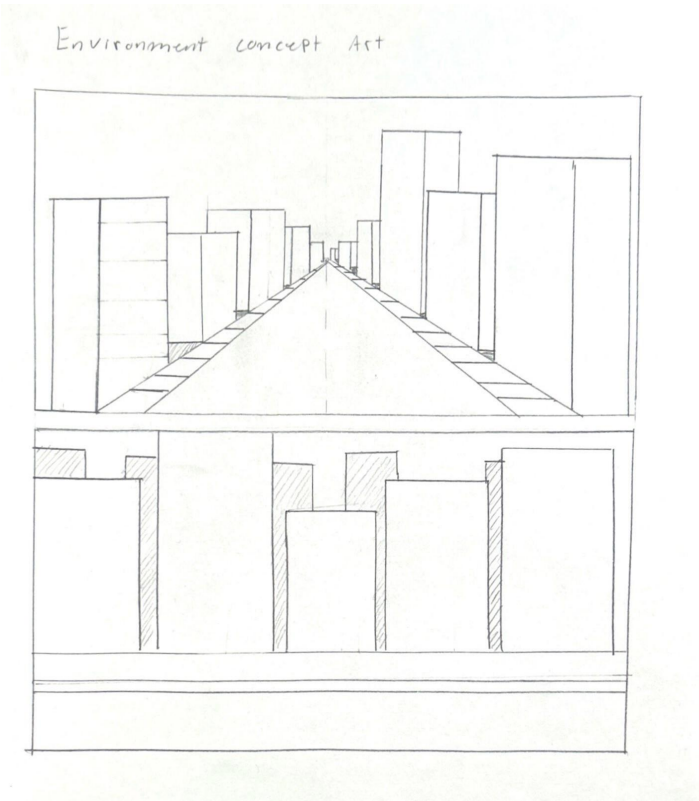
7. Sketches

7.1 - Fatima

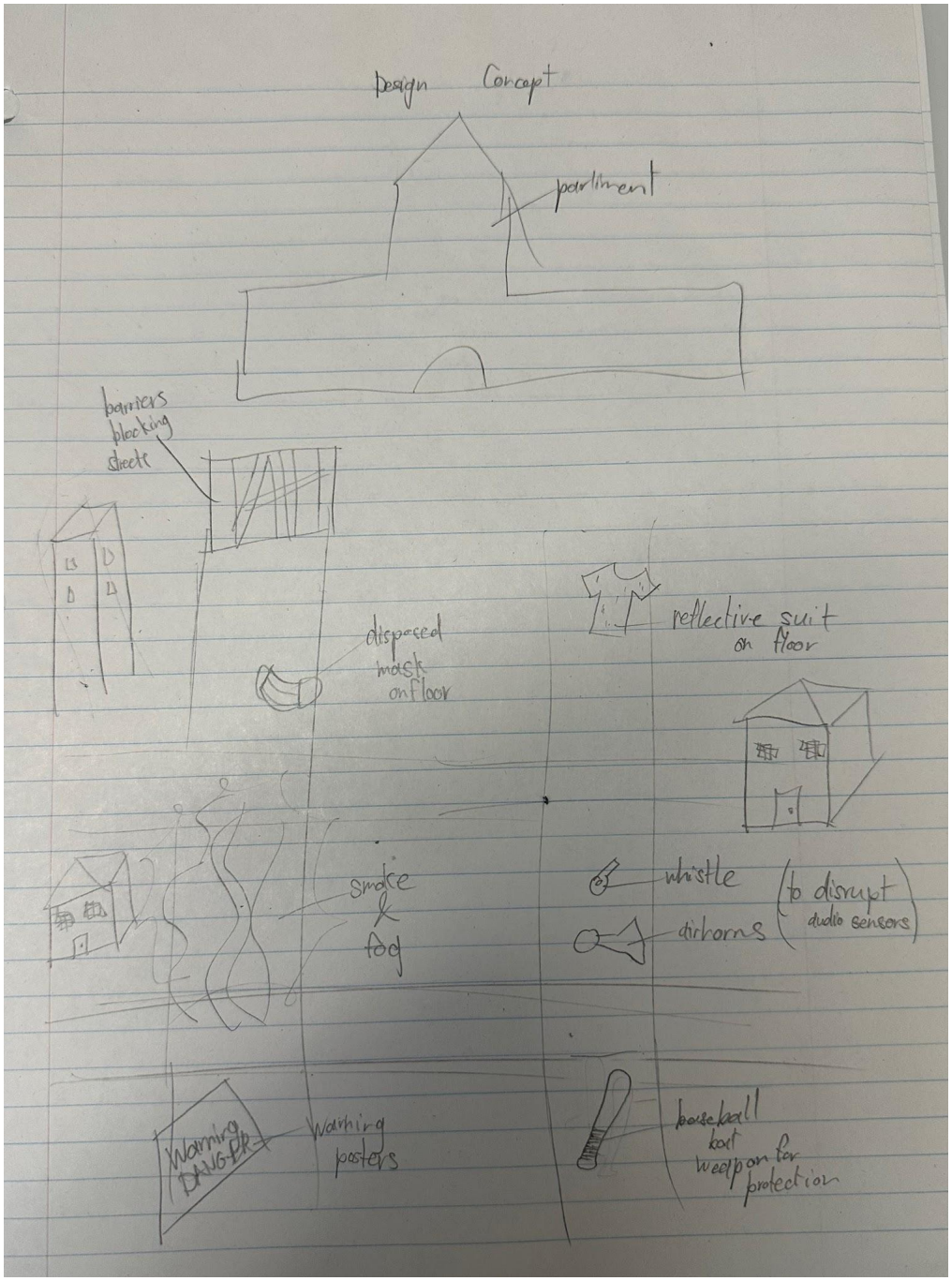



Scene 5:
Screen fades to white with final message in center
message to calling for action/
" " ispire hope
interactivity
langue : francais
would you like to change the language to english ?
yes
no
instruction for how to use the VR equipment & how to go through the simulation
click on the glowing blue document
• flashing items to click on
• after a while instructions will shown on screen

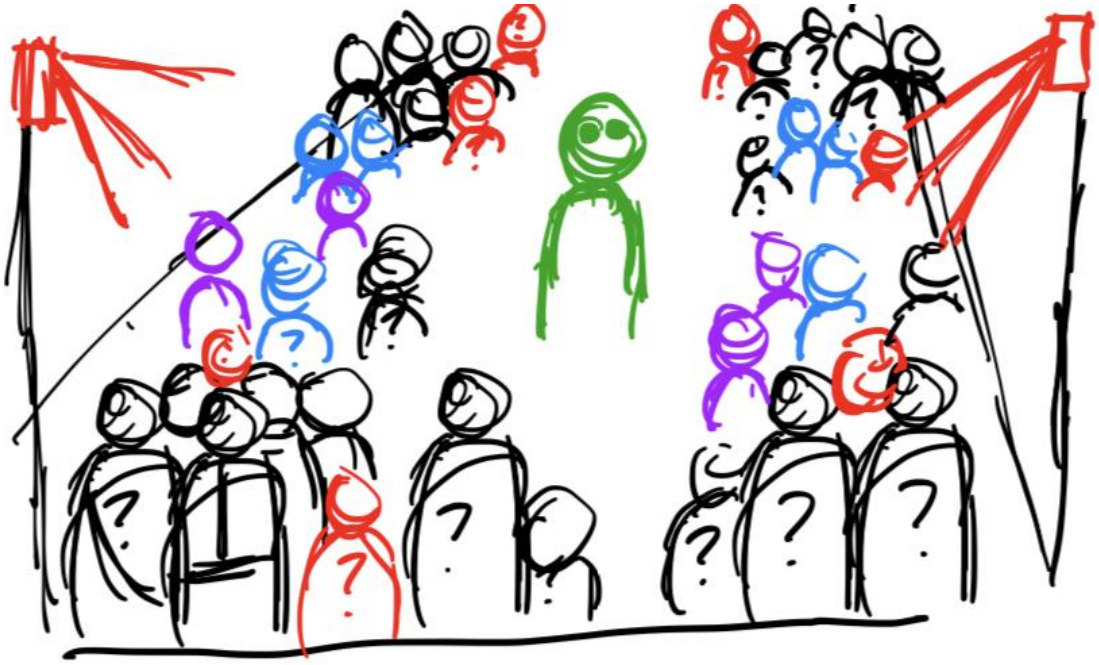
7.2 - Sami


Environment concept Art

7.3 - Amanda


design Concept
parliament
barriers blocking streets
displaced mask on floor
reflective suit on floor
smoke & fog
whistle
airhorns
(to disrupt audio sensors)
Warning DANGER
warning posters
baseball bat weapon for protection

7.4 - Jordon



7.5 - Mahmoud