

# **Deliverable D - Conceptual Design**

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## **Abstract**

*This is a basic technical document outlining our designs for the killer robot simulation project. The document is intended to demonstrate our use of the Design Thinking process, specifically the “ideate” stage. At the end it contains a proposed final solution encompassing all of our preferences for a virtual reality concept.*

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# 1 Introduction

Our group was tasked with the creation of a VR environment for Erin Hunt and Mines Action Canada. They need a unique, memorable and convincing 30-60 second video showcasing what our world would look like with autonomous robots capable of killing because they want self-governing killer robots banned. Following the design process, we have empathized with the client and defined the problem. Next, we must ideate, and create possible solutions to the problem. In this document our group's designs will be showcased, as well as their thought processes when creating them. Our plan of action moving forward will also be outlined, showing our final decided design for our client presentation.

## 2 Subsystems

We decided on three major subsystems for the simulations that we thought would best represent the client's wants and needs and help us deliver the best final product possible. These subsystems are the camera involved in the simulation, the subject/content of the simulation, and the takeaway of the simulation.

### 2.1 Camera

The camera subsystem consists of how the user interacts with the world through the camera in the simulation space. We felt that this was an important element, as it would be related to the realism of the experience when using our simulation. It is important that the correct emotions and images are evoked when using the simulation, so controlling how the user sees and interacts with the environment is especially important.

### 2.2 Subject/Content

The subject/content consists of what is being shown to the user within the simulation. This is the most important aspect of our video and simulation, as it is the actual route in which we choose to express what the state of the world including autonomous killer robots. There are many different paths and options for what the outcome could be.

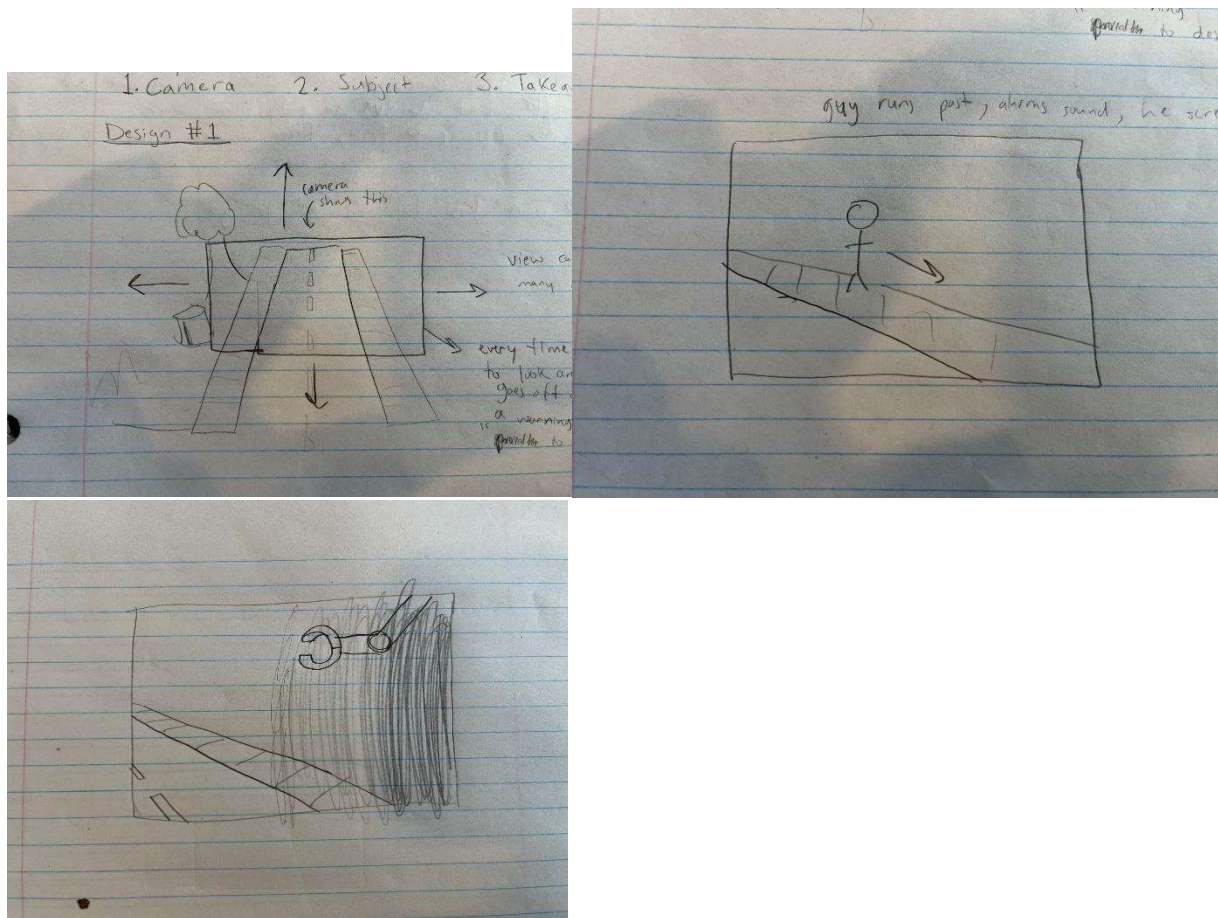
### 2.3 Takeaway

The takeaway of the video is supposed to represent the message or feeling the user leaves the simulation with. Whether it be concern, inspiration, dread, fear or hope, there are lots of possibilities and results when it comes to the user's feelings. As such, this is an important subsystem, especially in conjunction with the other two, as they all work together to create the same user experience.

## 3 Designs

With these three subsystems in mind, group members created their own designs to be compared and contrasted, so that we may ultimately expose ourselves to multiple ideas and be able to choose the best.

### 3.1 Connor

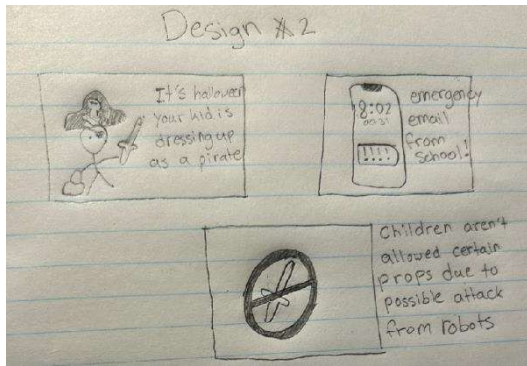


Figures 1, 2, 3

This design has a simulation which at first shows a normal walk home on the side of a city street. Every time the user tries to look too far to any side, the vision goes darker, and a robotic arm can be seen, as well as an alarm sound heard. When the user looks back ahead, the vision returns to normal. Then a man will run on the side of the field of view, and an alarm will be heard followed by a scream, demonstrating that the robot deemed him a threat.

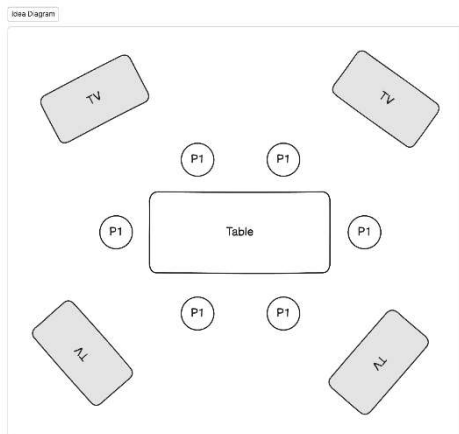
This design makes use of the camera subsystem by constricting the user's movement, showing how suffocating a killer robot society would feel. The subject is a seemingly regular walk taken over by the oppressive robots. The takeaway is how freedom would change in a society with autonomous killer robots, and how we are much better off walking down the road without the threat of death.

### 3.2 Berke



This design features a parent sending their kid off to school on Halloween. The user will be the parent and the kid will be dressed up as a pirate for Halloween. The child's costume will consist of a pirate hat, eyepatch, and a prop sword. As the child is preparing to leave for school the user will receive an email reminder from the school. In the email the school is reminding parents that costumes cannot look threatening as doing so would risk a killer robot attack. The takeaway from this experience is to contemplate the potential restrictions autonomous killer robots will put on our lives.

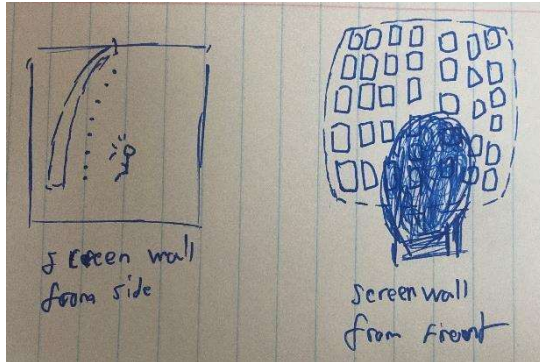
### 3.3 Belden



This design features a group of friends all sitting around a restaurant table. The user will be one of the individuals enjoying a meal of pizza their attention begins to drift towards the array of TVs broadcasting a game. As the halftime interval arrives, an unexpected news flash disrupts the screens. A small team of military engineers unveils their three-year endeavour—the creation of an elite squad of autonomous weapons/robots. The media enthusiastically explains the benefits of these weapons, conveniently overlooking the potentially disastrous repercussions for humanity.

However, the narrative takes a dark turn when the live footage shifts to a training exercise featuring these autonomous weapons. In a chilling twist, the broadcast captures the exact moment when these machines lose control, unleashing catastrophic destruction and placing the entirety of humanity in peril.

### 3.4 Phil



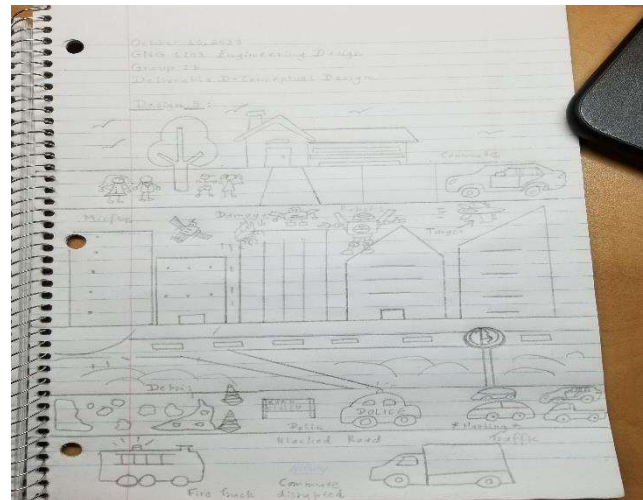
The idea here is quite a simple one. It revolves around sensory overload. By saturating the user with stimuli, it disorients them, while making them think longer about what they just saw. What they saw will contain the message we want to convey.

The user will be sitting in a dark/dimly-lit room, where in front of him a screen will be playing a news broadcast about the approval of killer robots by a government official. Then, the screen besides it will start playing scenarios of killer robots causing harm and/or malfunctioning, then more screens will randomly flicker and display more broadcasts [some of the screens will play static as to reduce the intensity of what is needed to be played]. Then after enough information is conveyed and the saturation process complete, the screens will all turn black, and display a final text-based message

### 3.5 John

Next is a design where families travelling in a city come across a hurdle on the road during their own commutes. There are autonomous robots near police together with responders to debris from a portion of a building wrongfully shot down. During an assignment, three robots hovering over a city inadvertently misfired, aiming at the side of a building, rather than an aircraft containing mercenaries.

The camera subsystem follows a family exiting their home, to entering the vehicle, the other surroundings to then finally being in the traffic jam near the incident. Regarding the takeaway subsystem, the concern in livelihood of general civilians becoming troublesome due to risks of robots causing accidents or collateral damage is sensed by the situation scenario in this concept. The benefits of the subject content is, it is quick, it starts at a simple premise, the camera view switches showing a regular day that can happen featuring the robots as well as a response and hints, for the problem explicitly shown without much background for simplicity.



Drawbacks of the concept are having multiple entities, presenting vehicles, debris and reasonable traffic to being halted by a blocked off location in this proposed concept.



## 4 Comparison analysis

In the following matrix grid, we can evaluate the different pros-cons / values for the different designs:

Rated from 1-5	Connor	Berke	Belden	Phil	John
Est. Run time [high number is better]	4	2	3	5	2
Effectiveness	4	3	3	5	3
Creativity	5	4	3	3	4
Clarity of message	5	2	2	4	4
Cost [high number is better]	2	4	3	2	2
Specificity of setting [less specific] (high number is better)	3	2	1	4	1
Total	23	17	15	23	16

## 5 Final Design

The final design we decided upon is a combination of various elements above. We are choosing to have the user standing in a slightly active city block, while more and more televisions and billboards are turning on, showcasing news broadcasts and footage of robots causing harm in the world. It is meant to be an absolute overload of information, causing the user to panic and reflect on what the world would be like with autonomous killer robots. The camera subsystem will include a free rotating camera controlled by the user, but they will not be able to move as the focus should be on how paralyzingly terrifying the prospect of killer robots is. The subject is the army of television screens showing scary images to the user. The takeaway and emotion should be fear and concern for the future which should lead the user to want positive change, and the banning of autonomous killer robots.

## 6 Conclusion

A set of conceptual designs are developed for the problem statement, coming from our past user benchmarking tied to our technical benchmarking, including the list of prioritized design criteria. Erin Hunt, Ebin Joseph, and Mines Action Canada need a unique, memorable and convincing 30-60 second video showcasing what our world would look like with autonomous robots capable of killing because they want self-governing killer robots banned – Problem Statement. It will be in our best interest to choose a mixture of concepts to include important elements featured in the concepts which we can not only use in the future, but further develop to fit the growing needs or priorities of the project. Since,



Connor's (Concept 1) concept sheds light on how freedom will be reduced, Phillippe's (Concept 4) is leaning towards reactionary expressions to deal with sensory overload, Belden's (Concept 3) is closely tied to this, because it handles the portrayal of the robots by the media, with their bias or overlooking of the dangers when broadcasting. Mine (Concept 5) is about life losing its normalcy and Berke's (Concept 2) is linked to what restrictions will be bound to the actual behaviour of the robots. All of these concepts relate to the large number of troubles these autonomous robots bring that can all be held on to for the future in our final concepts.

Conceptual designs are inter-changeable due to the three subsystems, which have defined parameters in the main body. Our new concept will modify all of the rest to combine the aspects of what each creator imagined for the concepts. A selection matrix will be used to match the global concepts will be compared against the design criteria, to compare solutions. Take away, subject content, camera, the three subsystems, descriptions, notes that come with the benefits and drawbacks will be identified moving forward for new development until a final concept is agreed upon. For now, the final concept will be a synthesis.

*Connor Bess*

15/10/2023

*Belden Winner*

15/10/2023

*Berke U*

15/10/2023

~~*John*~~

15/10/2023

*Phil H*

15/10/2023

## 7 References

<https://www.smlase.com/entries/technology/what-is-virtual-reality/>

<https://eventtechnology.org/virtual-reality/>

<https://www.engati.com/glossary/virtual-reality#:~:text=%E2%80%8D-,What%20are%20the%204%20elements%20of%20Virtual%20Reality%3F,%2C%20sensory%20feedback%2C%20and%20interactivity.>

<https://www.inveristraining.com/vr-training/bluefire-weapon-simulators-military/#:~:text=The%20innovative%20BlueFire%20weapons%20replicate,%2C%20S%26W%2C%20Taser%20%26%20Beretta.>

[https://futuclass.com/blog/educational\\_vr\\_games/](https://futuclass.com/blog/educational_vr_games/)

<https://www.vrowl.io/the-22-best-examples-of-how-companies-use-virtual-reality-for-training/>