Project Deliverable E - Group 5

Project Plan and Cost Estimate

GNG1103-C01

October 29th, 2023

Noor Trigui 300350022
Ava Butts 300350306
Luca Chayer 300375838
Dev de Haan-Sharma 300339994

Table of Contents

Introduction

After the previous three deliverables focussed on empathizing with the client, defining the problem, and ideating possible solutions, this report introduces an updated project concept that reflects the alterations made after a productive client meeting. Some of the key takeaways were a preference for a suburban setting, the elimination of the robot perspective, and an emphasis on simplicity. As a result, we opted for another one of our ideas from the previous deliverable; the project shifted to the interior of a suburban house, introducing adaptations within the house to showcase how the inhabitants have adjusted to a world with killer robots. Based on this new concept, the rest of the deliverable also highlights project risks and contingencies, includes a Bill of Materials and needed assets for the project, outlines a comprehensive prototype and test plan, and schedules key milestones leading up to Design Day. The planning outlined in this deliverable will prove to be valuable for giving us a direction to move forward with the project in the coming weeks and address any upcoming risks or challenges before the final presentation.

Updated Project Concept

Our concept has changed considerably since our last deliverable. During the second client meeting we received lots of good feedback on our first design. The major takeaways from our meeting is they liked our suburban environment, disliked our idea of playing from the robots perspective and they preached simplicity. After the meeting our group met to implement this feedback into our new design.

Major Design Changes

- Changed the setting to the inside of a suburban house rather than the street
- Completely ditched the idea of seeing the world through the perspective of the robot as it makes the robot a sympathetic figure which goes against our design criteria
- We changed our storyboard to fit in the house setting
- Implemented alterations to the suburban home to show how the people who live in the house have adapted to life in a world with killer robots

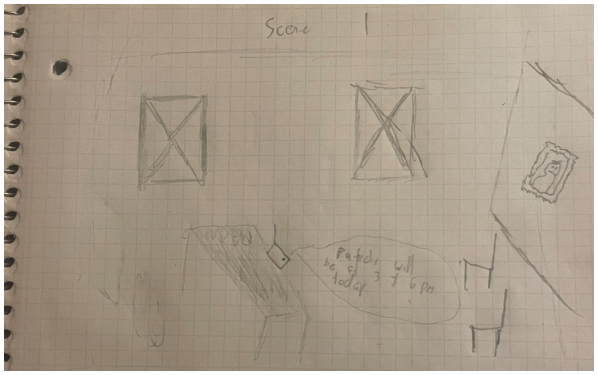
Things that stayed the same

- Sound subsystem (ambient noise)
- General idea for background (suburban neighborhood/house)

These elements are

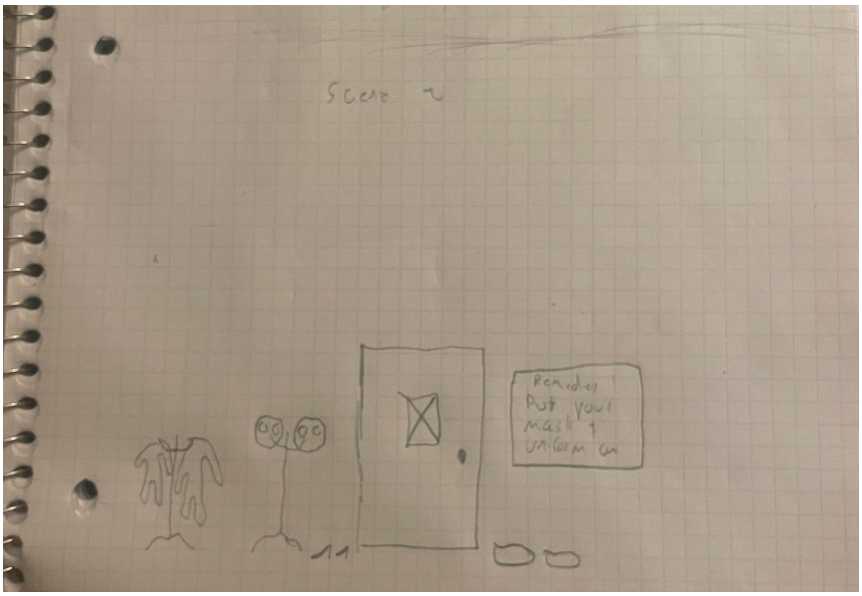
1. Boarding up of the windows to prevent the robots from seeing inside
2. Radio in the kitchen playing announcements as to when robot patrols will be
3. Masks and uniforms by the front door to make the members of the house look like a “safe” person who will not be targeted by robots.
4. Sign close to the front door that reminds the members of the house to put their mask on before leaving

Scene 1



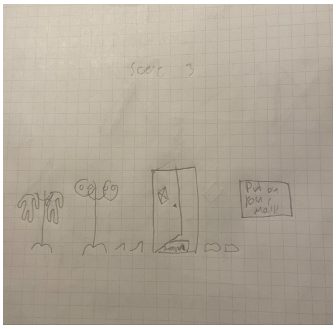
In the first scene the user will be in the living room of a suburban house. As they look around they will notice how the family who lives in the house has adapted to life with robots. They will hear the radio playing times of patrols and the windows are boarded.

Scene 2



The next room the user will enter is a mudroom. Here they will see even more signs as to how the family has adapted to life with robots. The window on the door is boarded, there are masks and uniforms of a “safe” person by the door for the family to use and there is a sign to remind the family to put on their masks.

Scene 3



In the final scene the user will leave the safety of the house for the outside world.

Budgeting & Assets

Bill Of Materials

Bill Of Materias

Equipment

Equipment	Type
Unity	Software
Oculus Headset	Hardware

Project Risks & Contingencies

Here is our list of significant project risks. Significant project risks are potential project related pitfalls that could derail our project to the point of it not meeting our project specifications on design day or not being ready altogether.

1. Falling behind schedule

With such a layered and complex project, there is always the risk of falling behind schedule. So far, our group has been able to meet all major deadlines rather comfortably, but it has been highlighted repeatedly to us that time will be the most major constraint. Luckily, we have tools such as wrike and the deliverables to help keep us on pace, and identify when we are falling behind.

Contingency

If our delay is caught early enough, our group could simply rectify this by committing more time to project work. Every member of the group has demonstrated their dedication to the project, and would be willing to put in the extra work to get back on track. In the case we fall too far behind too close to the deadline, our group may have to consider abandoning some of the less important

tasks on our plate. In this case, we would begin by consulting our TAs to get their opinion on the best course of action, and work from there.

2. Making a "Buggy" simulation

Though we aim to keep the programs used in the simulation rather simple, there is always the chance that they do not run perfectly, and that our simulation sometimes bugs. Hopefully, testing and prototyping stages would weed out these issues, but we must have a plan in case some go unattended to, and we realize too close to the deadline. Most likely, these would not render the simulation completely unusable, rather making it malfunction in certain specific scenarios.

Contingency

Depending on the severity of these bugs and the proximity to the deadline, this issue could be addressed in several different ways. For minor issues appearing to close to the deadline, we would simply try to film our submitted video without triggering these bugs. We would then mention the discrepancy in attached footnotes, but aim for our video to demonstrate the ideal usage of the simulation. For more major issues, we would turn to our TAs, but these would likely appear earlier in the process, giving more time to rectify the issue.

3. Going over budget

Given that the funds available are being allocated to specific assets at the current stage, there is the possibility of us not considering certain aspects that may be needed later on. With our budget capped, this would leave us lacking elements without having the ability to purchase new ones. Realistically, most of the needed assets have been considered, so any lacking elements would not heavily impact the final product.

Contingency

If assets are found to be missing, there are two courses of action we could take. The first would be to search for free assets on the unity store, and hope something useful can be found. If no appropriate assets are found, we could then try to design our own, but this would take a considerable amount of time.

4. Choosing unconvincing elements for our simulation

Our newest idea involves the user walking around a typical suburban house and seeing ways that the family who lives in the house has adapted the killer robots. This solution requires a few convincing elements in the house that can quickly and unmistakably show how the family has adapted to their new world. For these elements we chose masks and signs by the door to show that the members of the house need to hide their identity and boarded up windows to show that the robots cannot see in. If we stick with these elements and they prove to be unconvincing it will prevent us from achieving our number 1 design criteria of convincing policy makers.

Contingency

Similarly to how the first client interview changed our vision for the simulation, we expect future interactions with the client to have the same effect should this risk become a reality. Before the final product, we have 3 more opportunities to gather feedback from the clients. Hopefully, we

will be certain in our vision as early as possible as having to redesign the project later would cost a lot of time. In the case we feel we need to change the design, the contingencies from Risk 3 would come into play, as different assets would be necessary. Furthermore, Risk 1 would likely become a reality, as we would fall further behind, so the same contingencies would be used.

Prototyping and Testing

In the case of this project, prototyping and testing are mainly used to make sure that our concept or idea is feasible. Throughout the process, it is important to integrate user feedback into the prototypes to make sure that risks can be mitigated earlier in the design project. Due to the nature of a software development project and the time remaining to complete the project, most of our prototypes are high-fidelity and will be close to the function of the final product. However, the initial storyboard acts as a way to get more feedback from students, and hopefully the client, to allow us to update our project plan so that it matches more closely with the design criteria. Following prototypes and tests break up the project into more manageable pieces so that we complete the minimum viable product first (basic house design and movement functions) and then move on to more specific functions (sound effects and elements that will make our design stand out).

Overview of Prototypes and Tests

Test ID	Objective	Prototype & Test Description	Results to be Collected	Estimated Time
1	Ensure that the storyboard communicates our main message	Make a basic storyboard which has screenshots of the assets we are planning to use and communicates the intended game play and scene structure	Qualitative observations based on other students, and hopefully the client, of how well the story board communicates risks of autonomous killer robots	About one hour to make the storyboard and a week to gather sufficient feedback / perspectives
2	Ensure the player can move properly	Set a list of paths meant to correspond to certain inputs, and run these using a “movement” script in an undeveloped environment.	Mostly qualitative observations of how well the program produces the desired movements.	Given we already have an idea of such a program, I assume it would take one hour to develop the script and test it.
3	Ensure that the scenery is realistic based on the assets used	Import the assets into the scene and make sure that the movement still works. Update the scene to make it more realistic and fit our original	Qualitative observations to check that the scene is realistic and assets are successfully imported	It will take 20 mins to import the needed assets but we may take an hour or more to play around with it and adjust the

		storyboard		scene based on our research and user feedback
4	Ensure objects can be integrated with	Design a simple code that produces a response when the user interacts with an object. Run this code through an undeveloped environment with a designated object to be interacted with.	Qualitative observations on if the object responds to interaction as intended. Designate one clear change in behavior, such as change in color.	Given the simplicity of the test, this should only take an hour to develop and test.
5	Ensure that movement works in closed environments (the house where most of the VR will take place)	If the program from test 1 runs successfully, it can be tested in a closed environment, most likely whatever model for the house we end up using. The test would be similar using paths and inputs, not also causing collisions between the player and walls to see how they interact.	Same observations as the first movement test (Test ID = 2), with keen attention on how the player interacts with other objects.	Given the code would be written, this should take only 30 minutes.
6	Adjust the house asset to show the effects of autonomous killer robots (see project plan for these elements)	Examine the window and radio (scene 1) and the window, masks, and signs (scene 2) making sure that they are realistic and visible no matter how you move around the scene	Qualitative observations to check that the scenes are realistic	Could easily take a couple hours to make adjustments to the surroundings and possibly even to the code of the VR
7	Ensure that the transition from the indoor to the outdoor environment is seamless and doesn't cause any lagging or discomfort	There must be a virtual door that users can interact with to exit the house as well as an animation of the door opening to reveal the outside environment (similar elements in every	Qualitative observations to check that the scenes are realistic and that the transition does not introduce any performance issues, such as lagging	May take about one hour to code and test the transition but some adjustments may need to be made to the outside world which would take

		house - curtains over windows, locked doors, etc.). Some lighting changes would make the outdoor setting more realistic		a longer period of time (about an hour or two more)
8	Integrate sound effects into the VR based on certain interactions (ex. creaking noise when the door to outside opens and radio which would play throughout the VR)	Ensure that sound effects are in synch with VR interactions and that the sounds don't produce any lagging or affect user experience	Qualitative observations to check that the scenes are realistic and that the sound effects do not introduce any performance issues, such as lagging	Given the majority of the code would be written and most of the VR should be designed, this should take only 30 minutes to an hour.

Comprehensive Plan

Test ID	Start Date	End Date
1	Tuesday, October 31st	Sunday, November 5th
2	Wednesday, November 1st	Saturday, November 4th
DELIVERABLE F - Sunday, November 5th **Stopping Criteria**: Camera Movement is refined based on a free asset (not the final house asset that we will be using); We have enough feedback on the storyboard to understand what details we should be including in the final prototype / design		
3	Monday, November 6th	Wednesday, November 8th
4	Thursday, November 9th	Sunday, November 12th
DELIVERABLE G - Sunday, November 12th **Stopping Criteria**: The user can walk around a more refined environment with minimal bugs/lagging and interact with some elements; Prioritize elements that will be used in the final design		
5	Monday, November 13th	Tuesday, November 14th
6	Wednesday, November 15th	Sunday, November 19th
7	Monday, November 20th	Wednesday, November 22nd
8	Thursday, November 23rd	Sunday, November 26th

DELIVERABLE H - Sunday, November 26th **Stopping Criteria**: The user can walk around the house, notice the boarded windows, masks, costumes, and signs / posters; The sound effects for the radio and creaking door are seamless and add to the overall design; The outside environment has similar safety / adjustment elements as inside the house
DESIGN DAY - Wednesday, November 29th

Wrike Link

https://www.wrike.com/frontend/ganttchart/index.html?snapshotId=QXc7Zf2KA2NQ8uB1g97SB4pLFO6d2b51%7CIE2DSNZVHA2DELSTGIYA

Conclusion

In this report we outlined how our VR simulation has changed since our most recent client meeting and the feedback they provided. We also decided on our bill of materials and overview of prototypes and tests. These will be foundational elements for us and will keep us organized on track and honest. The final element of this deliverable is the project risks and contingencies section. This section proved to be a valuable reflection and prompted good discussion on how we can move forward without falling into these potential pitfalls.