

Deliverable G - Prototype II and Customer Feedback

GNG 1103 - Engineering Design

Group 15

November 12, 2023

1. Feedback Outline:

Following the presentation of our first prototype, the primary feedback received from our client was centered around the need to properly manage the project's timeline due to its potential intricacy. The clients highlighted the effectiveness of the medium used to convey our message and the overall environment constructed surrounding it. Concerns were raised on the potential delays we might experience due to the limited time frame for the project and the level of both perceived level of detail and difficulty involved in our design. The feedback given by our clients has prompted us to reanalyze our timeline and ensure clear and reasonable deadlines are in place to ensure the components of our final design are constructed both punctually and to the utmost quality. **Before, we did get feedback on our shortage of movement mentioned in the last deliverable. To create more realism in the simulation for more persuasion, this latest prototype allows for users to pinpoint spots to move to in the simulation, in a small space, in all directions.**

2. Prototype Questions:

What: We've developed a visual prototype illustrating the Unity environment created for user immersion. This prototype grants insight into the user's surroundings and perspective. In prototype three, an inclusion of vr interface is tested to be available giving users a view into the environment, freedom of movement by the use of two arm joints. Movement vertically, horizontally, backwards, looking up or down are all the extent of the new sense of freedom.

When: Prototype 2 was done on the eleventh of November. Our latest prototype will move us closer to the comprehensive analytical model, after the third. Testing will be consistently conducted throughout the design process to gather an ongoing and diverse stream of feedback from voices we consider important, whether it is potential users, supervisors or volunteers.

Why: Our objective is to build the optimal environment that inspires users to actively choose a ban of this prospect. This involves evoking concern, hope, and motivation, through what users see and feel. Testing is imperative to determine whether our concepts achieve the desired outcomes. By the means of the user's senses, they

3. Analytical/ Numerical/ Experimental Model

Test ID	Test Objective (Why)	Description of Prototype used and of Basic Test Method (What)	Description of Results to be Recorded and how these results will be used (How)	Estimated Test duration and planned start date (When)
T1	Easy Navigation	<p>Prototype 1</p> <p>Test Method: Construct scenarios that require users to navigate through different parts of the VR environment. Observe how easily users find and reach their destinations. Ask users to verbalize their thoughts as they navigate.</p>	<p>Comprehensive + Physical</p> <p>Observe how easily users find and reach their destinations and the thought process used to do so. Recorded the data quantitatively in order to iterate further on the simplicity of the experience's navigation.</p>	<p>Duration: 10 minutes</p> <p>Start Date: 11/16/23</p>
T2	Simulate Threat	<p>Prototype 1</p> <p>Test Method: Use an app to record biometric measures like heart rate to gauge responses to simulated threats. Post simulation gets subjective feedback on the perceived realism of threats through surveys.</p>	<p>Focused + Analytical & Physical</p> <p>Analyze heart rate levels (speed, rhythm and strength). Record the quantitative data and compare metrics prior to T2 and post T2. In order to determine to what degree the</p>	<p>Duration: 20 minutes</p> <p>Start Date: 11/16/23</p>

			level of a threat is needed to be imposed on users for perceived realism.	
T3	Safety Adaptations	<p>Prototype 1</p> <p>Test Method: Conduct post VR interviews to inquire on the users opinion of how the participants adapted during the events.</p>	<p>Comprehensive + Physical</p> <p>Interviews will be recorded (mp3) and the qualitative data will be taken into account when analyzing the ways for the participants in the environment to better adapt.</p>	<p>Duration: 20 minutes</p> <p>Start Date: 11/16/23</p>
T4	Educational Elements	<p>Prototype 1</p> <p>Test Method: Conduct post VR surveys to inquire on the users opinion of how educational the overall experience was.</p>	<p>Comprehensive + Physical</p> <p>Surveys will provide qualitative data that will be referred back to when ideating improvements in the level of education in our scenario.</p>	<p>Duration: 20 minutes</p> <p>Start Date: 11/16/23</p>
T5	Immersive Experience - Interactions with intractable object function	<p>Prototype 1</p> <p>Test Method: Construct scenarios that</p>	<p>Focused + Physical</p> <p>Recorded the data</p>	<p>Duration: 10 minutes</p> <p>Start Date: 11/16/23</p>

	as defined	require users to interact with specified objects and observe how this is done. As well as ask users to verbalize their thoughts as they navigate.	quantitatively through the observer's notes and through recording the users verbalizations in order to assess improvements needed on the functionality/im mersion of the design.	
T6	One-Minute Duration	<p>Prototype 1</p> <p>Test Method: Construct scenarios that require users to navigate through different parts of the VR environment to achieve a specified objective and track completion time of the scenario.</p>	<p>Focused + Analytical</p> <p>Durations will be tracked using a timer. This quantitative data will be used to improve the number of tasks/events between the start of the VR experience to the intended end of the VR experience.</p> <p><i>Model¹</i></p>	<p>Duration: 5 minutes</p> <p>Start Date: 11/16/23</p>
T7	Compatibility - Video integration	<p>Prototype 1</p> <p>Test Method: Walkthrough the video integration used in the VR environment and observe how users interact with the</p>	<p>Focused + Physical</p> <p>Recorded the data quantitatively through the observer's notes assess</p>	<p>Duration: 10 minutes</p> <p>Start Date: 11/16/23</p>

		integrated videos.	improvements needed on the video compatibility of the video integration.	
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The camera, subject/content, and takeaway subsystems are all working seamlessly to fulfill our goal of communicating the potential threats posed by autonomous weapons to our world.

Numerical Model:

T6 - Model¹

Objective:

Quantify the completion and assess the relationship between the time to complete and the number of tasks/activities present.

Variables:

1. $T_c = \text{time to complete in seconds}$
2. $N = \text{Number of tasks/events}$

Assumptions:

- The time to complete is influenced by the number and complexity of tasks/events.
- There is a linear relationship between the number of tasks/events and completion time

Model:

$$T_c = a \cdot N + b$$

Parameter:

$a = \text{coefficient representing the time taken to complete each task/event}$

$b = \text{Intercept representing the baseline}$

Data Collection:

- Record the time to complete for each participant
- Record the number of tasks/events in each scenario

Analysis:

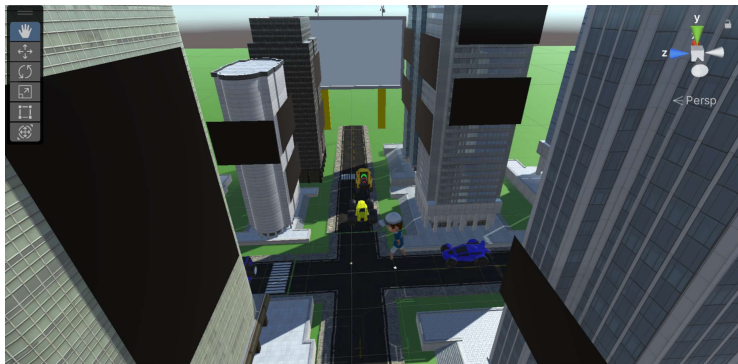
- Perform linear regression analysis to determine the coefficients a and b .
- Calculate the relationship between the time to complete and the number of tasks/events.

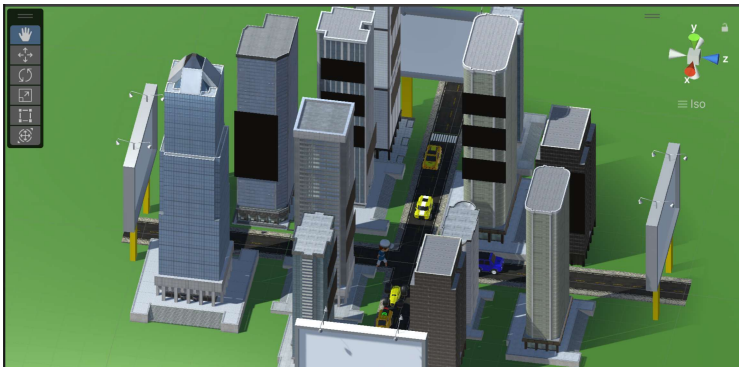
Results:

- Determine the impact each task/event has on the time to complete
- Use the model to predict the time to complete based on the particular tasks/events and assess which tasks/events ensure the time to complete is less than or equal to 1 minute while also having the most impact on solving the problem statement.

4. Documentation of Results (Video to be included in submission)

Prototype Images (Video to be included)





5. Gathered Feedback

TA Ebin Joseph & TA Lab Section CO1 - Amongst one another during use 11/11/23 in Makerspace Lab

- Test the new video editor for all of our inclusion of video
- Brainstorm on what means will be used for the audio in our reporting for the screens
- Gauge the expansion our city will have, what that means for characters and movement
- Gather feedback before the vr application in our simulation is demonstrated officially
- Troubleshoot the sequence of our reporting in tandem to the audio when time
- Be mindful of the time of the broadcasting
- Have a timely message at the end of simulation

6. Target Specifications, BOM, detailed design

There are no updates to our Bill of Materials from the last table, except the addition of a research style poster for use during Design day of an estimated \$40.

- Tests are completed without further updates
- Tests are analyzed without further updates
- BOM is not updated
- Target specifications remain
- Detailed design is not updated
- N/A

7. Prototype Test Plan:

The following is our prototype test plan for the upcoming deliverables : - Prototype 2 - Objectives - Test interaction and other software based integrations - Analyzing usability and functionality of critical subsystems - Stopping criterion - Video integration works well - Interactions with intractable object function as defined - Prototype 3 - Objectives - Graphical fidelity work - Test Performance - Optimize optimize optimize - Test the package on actual users to get feedback - Stopping criterion - The whole team is satisfied with the work done. - The original vision is achieved to the extent of our original expectations

-Task Plan Updated -

<https://trello.com/b/R5QTrMG9/project-timeline>

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12/11/2023

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