

Project Deliverable C: Design Criteria and Target Specifications

Deliverable B - Due 4 February 2019

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Design criteria

The design criteria for this project is derived from the interpreted need from our client.

5 - Highest Priority 4 - Medium-High Priority 3 - Medium Priority 2 - Medium-Low Priority 1 - Lowest Priority

Client Statement	Interpreted Need	Design Criteria	Importance (1-5)
Cancer patients are prone to nausea, which can be caused by flashing lights, fast paced motion, etc.	The VR app does not induce nausea.	Presence of artificial motion.	4
Cancer patients are predominantly older, but there are cancer patients of virtually all ages.	The VR app has content suitable for all ages.	Appropriate content.	2
	The VR app is simple to use across age groups.	Simple setup.	3
		Setup can be fulfilled by the attending nurse.	4
According to information gathered during focus groups, patients favour calming experiences.	The VR app is tranquil.	Calming, soothing, peaceful content.	4
Patients must remain completely still during radiation therapy, and in the case of chemotherapy, patient have only one arm to use a controller.	The VR app is usable with limited motion.	Meets dexterity requirements.	5
	The VR app has simple controls.	Simple controls.	5
Radiation therapy and chemotherapy have	The VR app experience lasts the duration of the	Variable length of experience.	1

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varying session lengths (15-30 minutes, to a few hours or even an entire day).	treatment.	Appropriate duration depending on treatment.	4
		Save/load function.	1
Consider creating a virtual assistant to be there with the patient (a companion to join the user on their healing journey).	The VR application contains artificial and interactive companions as moral support.	Presence of companions in the virtual experience.	3
Audio stimulation contributes to a positive experience.	The VR application contains calming audio.	Calming audio.	4

Design requirements

The requirement is a “functional” requirement if it either allows the app to run, AND/OR it enhances the comfort of the patient during chemotherapy/radiotherapy treatments.

- Function requirements
 - Calming, soothing, peaceful content.
 - Presence of NPCs in the virtual environment.
 - Calming audio.
- Non-functional requirements
 - Simple setup (time it takes to set up the game).
 - Setup can be fulfilled by the attending nurse.
 - Variable duration of experience (duration in minutes).
 - Save/load function.
- Constraints
 - Presence of artificial motion.
 - Appropriate content (ESRB rating).
 - Limited dexterity and range of motion.
 - Appropriate duration (duration in minutes).

Benchmarking

	Game			
Design Criteria	KIMO by Oncomfort	Snow World by University of Washington	Bravemind by USC University of Southern California	Farmooo by Simon Fraser University

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Presence of artificial motion	None	Slow panning of the camera through each level.	Vehicle (car and helicopter) and walking speeds	Walking around a farm at a leisurely pace. Cows are walking around slowly as well.
Appropriate content (ESRB Rating)	No rating, educational gaming.	No ESRB rating; seems like it would have an E rating.	No ESRB rating. Simulates a war environment.	No ESRB rating; Very peaceful farming simulator.
Simple setup (time it takes to set up the game)	Accessible. Plug and play.	Game is played on a laptop; very simple setup.	VR head-mounted display, with controller or prop rifle	VR headset, controller and a computer/laptop.
Setup can be fulfilled by an attending nurse.	No training required for usage.	No training required for usage.	No training required for setup.	No training required for usage.
Calming, soothing, peaceful content.	Positive, distracting, stress-reducing, hypnotizing, amusing and relaxing. 65% reduction in anxiety in 18 minutes (pilot data).	Game is based on shooting snowballs at penguins. Content itself is not intrinsically calming or soothing, but some nurses noted that they could do work on patients and the patients would not even notice while they are playing the game.	Stressful, realistic environments. Vibrations, Loud audio and artificial smells occur. Pace of game is regulated to the users comfortability.	Farmoooo is a simple farming simulator where you plant crops and feed cows. Very calming and distracting environment with peaceful gameplay. Designed for teens with cancer.
Meets dexterity requirements.	Yes, wireless.	Yes, so long as a patient can at	Movement of user varies	Requires patients to use

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		least click a button.	depending on the simulation, no hands to 2 hand could be required, wired headset.	controllers.
Simple controls.	None, immersive 360 degree view experience.	Patients aim with their eyes, and shoot with a button. Alternatively, patients can use a mouse. Very simple controls.	Controls vary for the simulation they are in, simple controls. Free hand, 2-handed controller or 1-handed controllers are options.	Basic controls to plant crops, call cows and move around.
Variable length of experience./Appropriate duration depending on treatment.	13-16 minutes	Duration seems to depend on the level. Exact duration is not noted. Could be adjusted to any length.	Duration is dependant on the specific simulation and attitude/comfort of user.	The duration of the game is infinite.
Save/load function	N/A	None.	none.	None.
Presence of NPCs in the virtual experience.	Narrator but no physical virtual presence.	No companions.	Multiple artificial companions.	No characters but the scene has cows.
Calming audio.	3D audio.	Music plays in the background by Paul Simon.	3D audio. Gunfire, explosives, radio communication, sirens and background cries/screams.	Sounds of nature and pleasant guitar.

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Benchmark ranking (1-4) (Worst-Best)

Design Criteria	Weight	KIMO by Oncomfort	Snow World by University of Washington	Bravemind by USC University of Southern California	Farmooo by Simon Fraser University
Presence of artificial motion	4	4	3	1	2
Appropriate content (ESRB Rating)	2	4	4	1	4
Simple setup (time it takes to set up the game)	3	3	3	3	3
Setup can be fulfilled by an attending nurse.	4	4	4	4	4
Calming, soothing, peaceful content.	4	3	4	1	3
Meets dexterity requirements.	5	4	4	2	2
Simple controls.	5	4	4	2	3
Variable length of experience.	1	3	4	4	4
Appropriate duration depending on treatment.	4	2	3	3	4
Presence of NPCs in the virtual experience.	3	3	1	4	2
Calming audio.	4	3	3	1	3
Total:		133	132	87	116

