

Project Deliverable C: Design Criteria and Target Specifications

GNG 1103 – Engineering Design

Faculty of Engineering – University of Ottawa

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List of Prioritized Design Criteria:

Non-functional requirements :

1. Realism: The VR experience must be designed in such a way that it would give the most immersive experience to the users.

2. Durability (Product life): Durability refers to the life length of a product. The VR experience must be designed in a way that it can perform flawlessly for a very long time period, no error should occur within the period of use (lagging, system crashing, etc).

3. Safety: The VR experience should be designed in a careful way that would avoid causing any possible mental illnesses or sensory-induced medical conditions.

4. Aesthetics: The VR experience should present an aesthetic virtual world that would look like an absolute artistic art piece with detailed graphics.

Functional requirements:

1. Interaction: The VR experience should be interactive (with simplicity) where appropriate.

2. Sensory feedback: System should give the proper sensory feedback under different occasions. Users should feel reasonable and proper sensory feedbacks (For example: User should feel the forces of impact from different collisions; camera shaking and or sound cutoffs)

3. Immersion: Compatibility with both 360 video format and VR video format. (aka YouTube 360 versus Oculus film)

4. Emotional Response: The design should outline and convince those of the ethical concerns regarding autonomous weapons.

Constraints:

- The design is not too gory. (no blood)
- The design does not name any real countries or companies.
- The VR experience is not too long. (the amount of time it takes for a washroom break, 5 mins maximum)
- The VR experience should be made for a single person.
- The VR strays from any controversial topics.
- The VR experience follows a single pathway.
- The user will not die in the experience.
- The design should not require lots of setup or movement.
- The design will be good to use for those with certain health concerns (obesity, epilepsy, heart problems, or any sort of impairment).
- Design must be able to be made within the \$50 budget.

Technical Benchmarking:

Film Title → Specifications ↓	My Brother's Keeper	Home After War	The Fight for Falluja
Time Framing	During the war	After the war	During the war
Camera Perspective	360° & 180°	360°	360°
Time Perception	120 FPS Slow Motion	-	-
Footage Used	Reenactment Footage	Real-life Footage	Real-life Footage
Camera Movement	Dynamic Moving Camera	Camera moves with Player Character	Standstill Camera
Camera Perspective	Close-up Shots	-	-
Interactable	-	Character is able to Control Movement	-

- Yellow** - Unmeasurable for desired effect
Orange - Unsure for desired effect (Situational)
Green - Ideal product features
Red - Not ideal features

Target Specifications (note that the priority order of these goals is arbitrary for now and subject to change, with the main exception being Functional Requirement 1):

#	Specification	Relation	Value	Units	Verification Method
	Functional Reqs.				
1	Convince users of the ethical concerns surrounding autonomous weapons	=	Yes	N/A	Testing, reviews
2	Interactivity	=	Yes	N/A	Testing
3	Sensory Feedback	=	Yes	N/A	Testing
4	Compatibility with both 360 and VR Video Formats	=	Yes	N/A	Testing
	Constraints				

1	Duration	<	5.00	Mins	Checking time length during production
2	Avoid naming real entities	=	Yes	N/A	Reviewing script and experience for any references to extant entities
3	Avoid controversial topics	=	Yes	N/A	Reviewing script and experience for any references to extant entities
4	Not too gory	<	PG-13	VMRS, blood	Referencing VMRS rating criteria; limiting blood in experience
5	Single-Person	=	1	User	Designing experience for only one user
6	Cost	<	50	\$	Recording project expenditures
7	Do not require much movement or setup	=	Yes	N/A	Testing
8	Single path	=	Yes	N/A	Not designing any more paths
9	User character must not die	=	Yes	N/A	Not allowing for deaths, testing final product
	Non-Func. Reqs.				
1	Realism	=	Yes	N/A	Testing
2	Durability (Product Life)	=	As long as issue persists	Weeks, months, years	Testing and feedback post-release
3	Safety Measures	=	Yes	N/A	Testing
4	Good Aesthetic	=	Yes	N/A	Testing

Reflection: Prior to the client meeting a general summary was known regarding the topic of the project. The client meeting allowed the groups to ask questions to clarify what the exact parameters and constraints were so that a clearer picture of the project could be seen.

3 films were able to be benchmarked as the criteria to compare VR films to this project became apparent. After meeting with the client, the task shifted from a demonstration video of how AI robots would negatively affect all aspects of war, to an interactive film showcasing the effects of war and how robots without empathy or morals would amplify the tragedy exponentially.

Home After War is the best comparison to the VR experience the group wishes to create, as the narrative and interactive aspects of the film work well with the constraints and requirements we

are given. 360° is the best format to use, as VR allows the user to feel like they are actually in the area. Time Perception and Camera Perspectives are film tricks to have the user feel more engaged and present in the films, but they can only be used in specific situations to create the desired effect of dramatization. The camera movement and interactable aspects of Home After War will most likely be the closest reference to our final product which we will be presenting to the client.

The client meeting clarified our many points of confusion about the exact nature of the situation and also gave us a better idea of what type of experience they hoped for us to create. It allowed us to understand primarily what not to include in the final product and certain things that must be involved. For now, we are still unclear on the relative priority of some of the needs and constraints, but the most important needs were identified, and from those, the most important specifications were set. For the time being, our ongoing work on the specifications list is mostly a matter of determining the relative importance of several incredibly important specifications, each necessary and thus making ordering difficult, and several lesser ones, which are not as important and therefore can have a more fluid priority order; apart from this, we are unlikely to derive many new specifications until the next client meeting or remove many new specifications from the list of needs we previously generated. It is, however, astounding to see how much one can infer just by holding a conversation with the clients, even information such as hints to the mood that are never spoken aloud. While it is possible we will revise, expand, reorder, ignore (lower priority), or delete entries from the specifications table, we believe that this list of specifications is a good starting point.

It is slightly concerning how many of our specifications cannot be measured as metrics, and resolve to a boolean value; many of our specifications also can only be tested via... “testing” (of the product” for the time being. It is our hope that as we become more proficient in relevant fields we will be able to be more specific with some of these specifications and be able to identify more relevant metrics and ways to quantitatively measure performance where possible.