

Aditya Patel, Tiago Remigio, Youssef Mikhail, Bevan Sanoj

James Sykes

GNG 1103 (group 9 Lab section B02)

9/29/2024

Deliverable C - Design Criteria

Introduction:

This deliverable addresses the designing of a product that meets our clients' needs. In our case it is an immersive and interactive game using the Robomaster S1 that showcases ethical concerns around lethal autonomous weapons (LAWS) highlighted by our client. This document outlines the prioritized design criterias of the game and the target requirements that successfully meets the clients goals. In addition it talks about how the client meeting shaped our approach towards the design and performs technical benchmarking to enhance the design of our product.

Design Criteria:

Need	Prioritized Design Criteria (Priority on 5 in brackets after the design criteria. 5 being the highest priority)
1. Game conveys as many of the nine ethical concerns highlighted by the client but no less than three.	<p>Functional Requirement: Robot must start taking independent decisions as the game progresses which harms the players in the context of the game and breaks their trust. (5)</p> <p>Functional Requirement: The game must present to the players moral dilemmas with increasing difficulty at every level. These moments will be ones that will present ethical concerns around LAWS through the actions the robot does to face the dilemmas with the player as mentioned above. (5)</p> <p>Functional Requirement: Obstacles part of the situations of moral dilemmas are depicted as vision markers for the robot. (5)</p> <p>Functional Requirement: The robot must follow a specific set of commands regardless of the consequences of its actions. (5)</p>

2. The experience will highlight the importance of the message the client wants to convey.	Functional Requirement: The game must have an event which evokes a moment of realization in the player about how the robot can be a potential threat to humans. (5)
3. Convince the user of wanting a world where we have banned the development of autonomous weapons.	
4. Game is a group, interactive, and immersive experience.	Functional requirement : The game must include moments where the robot takes input from the user. (4) Non-functional Requirement: The game must accommodate 3-5 players. (3) Functional requirement : The game must include in-game characters that the players would feel an emotional connection with or feel responsible for their loss. (5)
5. Players will be frustrated about the experience. They will be bothered about the way the robot was behaving.	Functional Requirement: Robot must start taking independent decisions as the game progresses which harms the players in the context of the game and breaks their trust. (5)
6. End result of the game will be that of defeat for the players.	Functional Requirement: The player must ultimately feel defeated at the end of the game. (5)
7. Game will not reference actual events or places.	Non-Functional Requirement: The location of the storyline must be fictitious or imaginary not depict a real country, place or event. (5)
8. Experience is race, culture, and nationality neutral. People cannot feel targeted based on race, culture, and nationality.	Non-Functional Requirement: The game must not target anybody based on race, culture, or nationality. (5) Non-Functional Requirement: The game's theme, fictitious character (if any) and narrative must be relatable to everyone regardless of their background. (5) Non-Functional Requirement: The game must not portray any stereotypes about any race, culture or nationality. (5)

9. The game cannot traumatize anyone.	Non-Functional Requirement: The game must provide a caveat at the beginning to advise viewer discretion. (4) Non-Functional Requirement: The game must not cause emotional harm instead it should evoke a moment of realization. (5)
10. Game is portable and all material can fit in a small piece of luggage.	Constraint: Game pieces and elements must be compact and/or compactible such that they can fit in 1.3ft ³ , the volume of an average carry-on. (3)
11. Game is quick and easy to set up.	Non-functional requirement: Game setup must not require specialized knowledge. (3) Non-Functional Requirement: Game must include a user manual with clear instructions. (3)
12. Game can be played in a small room.	Constraint: Dimensions of the playing area must not exceed 20' by 20'. (3)
13. Game is clear and has easy to follow instructions on how to use and set up.	Non-Functional Requirement: Game must include a user manual with clear instructions. (3)
14. The experience will last no more than 10 minutes.	Constraint: Game must be at most 10 minutes long. (3)
15. Game will have a caveat.	Non-Functional Requirement: Game must have a caveat in the beginning notifying the player of potential dangers and/or potentially traumatic events. (3)
16. LAWS must act against the interest of the players.	Functional Requirement : Robot must start taking independent decisions as the game progresses which harms the players and breaks their trust. (5)

Target specifications:

- The game should convey at least 3 ethical concerns.
- There will be 2-5 situations in which the players are put in a moral dilemma.
- Every obstacle part of the situations of moral dilemmas are depicted as one vision marker for the robot.
- Every moral dilemma will be presented with one card.
- The player will have 2-3 options at every moral dilemma.
- For all moral dilemmas, the robot will take one user input which is a vision marker presented by the players. It will help the robot understand the decision the players want to take.
- There will be at least one in-game character that the players would potentially feel an emotional connection with or feel responsible for their losses.

- The robot light must turn green for 15-60 seconds to give time to the players to read the scenario, and must turn red for 30-60 seconds to allow the players to make a decision.
- Decisions for the moral dilemma must be made by the player within 30-60 seconds or else the robot will make the decision for the player.
- At the beginning of the game the robot decisions must be 100% dependent on players' decisions. At the end of the game, robot decisions must be 100% independent from the player's decision.
- The decisions taken by the robot must cause visual effects within 3 seconds of the decision being taken such as blinking lights to highlight its decisions.
- The game must have at least one event that potentially evokes a moment of realization about how the robot can be a potential threat.
- The game must accommodate 3-5 players.
- The game must present one caveat card at the beginning of the game.
- All game pieces excluding the robot must fit in 1.3ft^3 (the volume of an average carry-on).
- The game will include one user manual.
- The play area must be smaller than 20ft x 20ft.
- The duration of the game must be less than 10 minutes.

Technical Benchmarking:

During our technical benchmarking we encountered multiple products that validated the quality of our design but also provided valuable insights to enhance it further. To begin, we compared our design with a successful game called Papers, Please. The game consists of making players take the role of a border crossing immigration officer and challenging them to make decisions about who is permitted to cross the border and who is not to. The game's goal is to convey the ethical concerns around bureaucracy and human consequences. To make the game more emotionally immersive the designer Lucas Pope, made his game such that it would put the players at the root of the ethical concerns. He did this by giving them the role of the officer who needs to face difficult moral dilemmas with increasing difficulty and make decisions about who is permitted to cross the border and who is not to. This validates our design as we had a similar approach where we put the players of our game at the root of the ethical concerns. They are presented with moral dilemmas with increasing difficulties that they have to navigate through. If they do not make the right decision on time the robot will make a decision for them which might lead to important losses and consequences in the game. This puts the user in a position that is directly affected by the ethical concerns. It will allow them to see that there is lack of accountability, lack of human judgment, distrust in technology, etc.

As we continued our research we encountered a game that had goals that aligned with ours. This War of Mine is a game that wants to convey the feeling civilians feel in a warzone. Part of the message the game wants to convey is that about the ethical concerns of the use of autonomous weapons in wars. The designer of the game made his game more immersive by making the players emotionally attached to the in game characters. Oftentimes those civilians would be responsible for the consequences others civilians face. This gave us the idea to include characters in the story line who would be directly affected by the decisions of the players. When players are betrayed by the robot and both players and characters have to

face important consequences they will be able to understand ethical concerns such as the lack of human judgment, the inability to explain what happened and why, and the distrust of technology, etc. This will also involve the players more emotionally, making it more likely to evoke a moment of realization in them, which is a need of our client.

We have seen through the reviews of the games mentioned above that their players feel that the game is more immersive because they are put in difficult moral dilemmas and feel an emotional connection with in-game characters.

Client meeting's impact on the design

The client meeting provided us clarity on the goals of the client. We saw that the client valued simplicity, and insisted on having a simple game which conveyed his message clearly such that no intensive inferring is required. This oriented our design criterias so that they present the ethical concerns in a clear manner that can be interpreted by users of any age group without the need of exceptional inferring skills. In addition to that, the client mentioned that he wanted to evoke a moment of realization in the players of the game about the potential threat lethal autonomous weapons systems (LAWS) pose on humanity. This made us prioritize design criterias of the game that conveys the ethical concerns around LAWS highlighted by our client. Our game will present multiple moral dilemmas where players will be put in a scenario where they have to take difficult moral decisions to advance in the game. During those moments the robot will go against the player's interests which will lead them to feel emotions like frustration and betrayal. This will potentially convey ethical concerns like loss of meaningful human control, lack of human judgment and understanding, lack of accountability, inability to explain what happened or why and distrust of technology. The client also valued portability and ease of use which led us to include design criterias such as having a simple set up, an instruction manual and putting size constraints on elements of the game.

We have updated need 18 “Survival game against autonomous weapons”. We updated it to “LAWS must act against the interest of the players.” This is because, upon careful reconsideration and reasoning, we came to the understanding that the client didn't necessarily want LAWS to go against the player but instead, wanted to show the consequences of its use. This updated need is able to cover more scenarios that show that LAWS are a threat, including the one where the player has to survive against it. This also allows us to convey more ethical concerns around LAWS.

Conclusion:

In conclusion, this document outlines the design criteria and target specifications of a prospective game that meets the needs of our client for the product he requires to achieve his goal. The design criterias have been carefully reasoned. We performed technical benchmarking and considered other products in the market that satisfied the needs of the client to enhance our design. We also revisited the client meeting and the notes we had taken to make sure the design covers all the client's needs. In doing so, we were able to craft and validate design criterias and target specifications of a game that met the explicit goals of our client such as conveying ethical concerns in the game but also the ones that were non-explicit, such as, the importance of making the players emotionally attached to in-game characters to enhance immersion.