ANALYSIS OF EXTENDED REALITIES

*“All immersive technologies extend the reality we experience by either blending the virtual and “real” worlds or by creating a fully immersive experience.”*

**EXTENDED REALITIES**

Extended reality technologies are not always used just in games and for entertainment purposes. There are alternative industries that take advantage of this emerging technology.

**Simulation in Alternative Industries**

Most alternative industries turn to extended reality technologies to create simulation type scenarios that best fit what they are trying to teach. When it comes to simulations within these industries, they tend to use their own system / platform to best fit what they are trying to achieve, but some may also use the classic platforms of the Oculus, etc. The main purpose of simulations in these alternative industries are as follows:

* Training Purposes – this includes some of the following:
  + Flight simulators
  + Medical simulators
  + Military simulators
  + Etc,
* Educational Purposes
* Health and Safety Purposes
* Job Purposes – this includes some of the following:
  + Architecture
  + Fashion
  + Etc,
* Travelling Purposes

Using extended reality technologies for simulations has proven to be quite successful in the list fields. It has advanced industries majorly and will continue to achieve goals no matter the industry.

**Serious Games in Alternative Industries**

Serious games offer a game-type experience while also teaching the player a thing depending on the game is about. When combined with extended reality technologies, like simulations, they can teach a more realistic and detailed experience. Unlike simulations within alternative industries, serious games tend to be developed for more accessible platforms like the Oculus and VIVE as they want to be reached by a larger population of users. The main purpose of simulations in these alternative industries are as follows:

* Learning Purposes
  + Helping those with disabilities / learning difficulties
  + Education based games
  + Etc,
* Message-driven Purposes
  + Mental Health awareness
  + Social
  + History
* Marketing Purposes
* Health and Safety Purposes
* Job Purposes

Using extended reality technologies for serious games allows an easier learning experience and has proven to be quite successful when it comes to getting across a message like most serious games do.

**PHYSIOLOGICAL CONSTRAINTS**

Although extended reality technology is an exciting new piece of technology, there also comes to be quite a few physiological constraints with that.

**Oculus Rift S**

* Connected by cords
  + As the device is connected by cords to the PC, this has a high-risk factor of getting twisted up with the cords or possibly tripping over it as you cannot see your surroundings with the headset on.
* Limited to PC
  + This device can only be used on a PC and not accessible for any other platform.
* No Insight Tracking
  + Insight tracking allows for the headset to track your movement and provide room scale tracking. Without that, the device cannot identify your surroundings meaning there could be a chance you could trip or injury yourself on something that you cannot see.
* Eye strain
  + This is a given with most VR headsets, but when wearing the headset for too long it can possibly lead to sore / damaged eyes as the screen is up close to your face.

**HUD AND UI DESIGN**

**VR Games**

HUD and UI design in VR games can tend to work quite like a normal game as it remains an overlay of the game. This basically means it stays in the same spot no matter where the camera view is moving around the screen.

Although, to avoid breaking the players experience in VR, the HUD and UI design should thematically converse with the games conceptual world to make the link stronger. The player should still feel part of the game even if they were to pause the game for example. This means sometimes sticking to the traditional HUD and UI design like most games may not be the right choice as mentioned before. To keep the player immersed is the most important aspect of a VR game experience, so designing UI to be APART of the game in some way allows for that experience *(eg, timer on the wall, things the player can hold instead like a map or a phone, etc).’*

Overall, when it comes to VR games, the goal is to keep the player immersed with the game and its HUD / UI through careful thought of where would be most realistic and interactable.

**HAPTIC FEEDBACK**

*“Haptic technology refers to any technology that can create an experience of touch by applying*[*forces*](https://en.wikipedia.org/wiki/Force)*,*[*vibrations*](https://en.wikipedia.org/wiki/Vibration)*, or motions to the user.”*

Haptic Feedback is used quite a lot on a day-to-day basis, like your phone vibrating to let you know you have received a notification. But in VR, it does so much more by adding a physical dimension to the stimulated world you are trying to convey to your player. This basically means it creates a more realistic experience to immerse the player in the experience even more. When it comes to how haptic feedback is being utilised, it falls under these two purposes of VR:

* Entertainment Purposes
  + Video game experiences
* Educational Purposes
  + Training experiences

When it comes to these points, it is mainly implemented to immerse the player in a way more realistic experience. It has been quite effective for VR game experiences, although studies looking at the benefits of haptics in VR are inconsistent. Some have found that this sort of force feedback is worse for students, while others have found benefits with serious limitations.

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