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BRIDGING THE GAP BETWEEN REALITY AND SIMULATION THROUGH TECHNOLOGY

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Introduction

Ever since the introduction of the original *PlayStation, Nintendo 64*, and the *Xbox*, gaming started to integrate itself into the mainstream medium. You could now comfortably sit at your home while playing these pre-made gaming boxes, with the polygons that fill up the screen and the low framerate coupled by the 16-bit sounds and low quality rendering. However, classics like *Rayman*, *Crash Bandicoot*, and *Metal Slug* arose from these games and maintain a nostalgic memory for millennial childhood. Now, we can play these games on our mobile phones. *Crash Bandicoot* and *Rayman* have both gotten remakes and reboots that revitalize the nostalgic feeling youngsters used to feel through contemporary gaming technology. Moreover, RPGs (Role Playing Games) are more accessible than ever. Notorious for their technologically demanding graphics and space, are still playable on smartphones and tablets - for example: *Raid: Shadow Legends* and *Lords Mobile*.

We live in a world of game creation and enhancements. Through the digital age, new technologies such as ray tracing, virtual reality, and augmented reality begin to form methods and ways of escapism in our modern capitalistic society in which a simulated hyper reality is presented to us through our digital screens and in them, stories and laws of a wishful utopia. Gaming spaces as Jenkins paints can be open fantasy worlds like *The Witcher 3*, in which a character traverses the vast space given to them, unlocking quests, unearthing hidden secrets, and archiving lore and histories. The main quest of RPG would entail the grand overseen main story line, however, there are plenty of other side stories that the player can complete. This gives the game world a realistic view.

Ray Tracing Technology

The culture of PC gaming is one of development, optimization, evolution, and cutting edge technology. PC gamers pride themselves with the latest gaming technologies that are produced by companies like AMD and NVIDIA. One of the primary units of a PC is the graphics card with a whole culture sprouting behind the introduction and updates of these graphics cards. Initially starting with GTX, PC gaming jumped to new heights allowing games such as *Call of Duty: Modern Warfare* and *Witcher 2* to be played at its most optimal setting, giving way to higher frames per second (FPS) and sharper images. It did not just stop there. Through the years, NVIDIA ultimately introduced a new series of graphics cards that amplifies and introduced a new age for computer gaming; and that was the GeForce Series 20 which unveiled a new lineup of graphics cards that support ray tracing technologies.

Ray tracing, as defined by NVIDIA: "Conventional 3D rendering has used a process called rasterization since the 1990's. Rasterization uses objects created from a mesh of triangles or polygons to represent a 3D model of an object. The rendering pipeline then converts each triangle of the 3D models into pixels on a 2D screen. These pixels may then be further processed or "shaded" before final display on the screen." In

layman's terms, this technological advancement allowed game developers to create hyper realistic images that could have never been done before.

Figure 1 – Image completely composited and rendered with ray tracing technology.

With the introduction of ray tracing, standard games such as *Minecraft* started incorporating this technology to optimize its graphical features. Light is now reflected off surfaces, water has a better depth of field and viscosity, lights refracts through glass and water, and the textures are refined and hyper realistic; not to mention also the support of full HD gaming.

As we can see here, one of the main key points companies love to invest into and optimize is graphics and gaming experience. Why is that? A reason can include the escapism aspect that was brought up earlier. Games are a form of escapism from the real world into a fantasy where one's problems cease to exist. Creating a world that looks like your own but holds an entirely different narrative and pulls you out of your routine lifestyle. Another reason is to always show improvement and development to drive up sales and usher in investors and new players.

Even with ray tracing being considered a cutting edge technology, there are still newer gadgets that came out during 2020 called GeForce RTX Series 30. This series expands PC gaming to the next level introducing 3070, 3080, and 3090. This new series aims to sustain a ray tracing game with high frames per second at an incredible 4k display and with the 3090 reaching the realm of 8k gaming. We see the pattern of constantly improving and constantly expanding, introducing new technologies and new software to sustain this ever growing gaming environment. 8k gaming was not something that someone would have dreamt of beforehand, but now is an actual reality that can be built in our homes.

Virtual and Augmented Reality

What is virtual reality? As the name suggests, it is another world that is created through simulations, creativity, and computer programing. These processed images come together to form another world that a player can explore. The use of VR goggles aims to narrow that bridge between a simulated world and reality by placing you within that world as if you inhabit that reality.

The rhetoric of imaginary (Smith, 1997) basically indulges the fantasy aspect of gaming where one can throw him or herself into an imagined and fictitious world in

which they can lose themselves, whether it is in their own mind or portrayed on a film/TV. But what underlines all of this is imagination n. In the modern era of technological revolution, we have created methods to transport our consciousness figuratively into a simulated virtual world. The introduction of VR (virtual reality) and AR (augmented reality) technologies has revolutionized imagination. We now see sandbox games (games that give you free range over the world) such as *Minecraft* integrated with this new technology where we put on goggles and are transported into the expansive world of *Minecraft* (virtual reality). Castles and monuments created and built by creative artists can be seen from a humble first-person perspective for a truly unimaginable experience. We also see the integration of *Minecraft* through augmented reality known as *Minecraft Earth*, similar to *Pokémon Go*. You can build structures in your real space through the lens of your phone. "Tavinor argues that this is also precisely what is going on in many video games: The images and sounds of a video game are props for the imagination." (Nguyen, 2017).

We can even see references to virtual reality in futuristic type films; for example: The *Black Mirror* episodes "*Striking Vipers*" and "*Playtest*". In *Striking Vipers*, we see the conscience of two individuals being uploaded into a simulated reality which is an extreme form of virtual reality. Same with *Playtest*, we find the technology of completely shaping one's conscience to suit that of a gamified event.

What's interesting about virtual reality is that the use of avatars plays a strong role in representation of who you are in online forums. For example, the famous *VR Chat* is a virtual reality experience that has you embody any avatar/character you want and/or desire and communicate with other individuals.

Figure 2 – Inside VR Chat. People communicating.

In figure 2, we can see a vast representation of different personas embodying the player. Characters from games, anime, TV shows, inanimate objects, manga, and even real life personalities all come together to create an environment among themselves in a virtual

space while remaining anonymous. "We can also find icons as a prevalent aspect in online video gaming where individuals use them as a form of representation that facilitates access and action between online and offline spaces (Apparaley and Celmens, 2017)."

As Apparaley and Celmens mention, avatars or icons play a detrimental role in online experiences. One can portray or act in ways they would not in the real world thus adding to the escapism theme portrayed earlier. One needs to act his own outside in the real world but can retreat into a new unique character and embody their characteristics - like jumping out of your skin for a few hours and seeing how life works in another world. We can explore this more deeply with the use of role-play. In general, video games, especially *VR Chat*, have a strong record of creating role-playing environments; sometimes these role-plays expand and explode into internet memes. For example, the internet sensation of the *Eugandan Knuckles* meme in which *Knuckles*, a character from the *Sonic* franchise, would run around and vocalize for their "queen". This popular meme originated from *VR Chat* where a collective amount of individuals banded together to create this scenario. We find aspects of role-play in other games as well such as *Minecraft*, creating *Minecraft* digital and virtual worlds where one can explore from the coziness of their seat and interacting with other players while maintaining an avatar to conceal their anonymous identity.

All in all, virtual and augmented worlds are seeing a rise amongst gamers, especially since *Sony* created their own VR headset that couples with their *Playstation*, and soon enough it would be common place to game with VR.

Cinematography

"Since the mimicking of 'camera work' always 'frames' and mediates the game, which suggests a meaning-ful affective experience. If we revisit the kinds of mediated 'seeing' that are possible in The Phantom Pain, for example, this directly relates to how the virtual camera images a particular moment in the visual representation of the game, which in turn connects to the presumption of a pre- existing visual literacy of film and television in the player/ viewer." (Murray, 2018). As Murray mentioned, video games create a sense of cinematography and cinematic elements where the player treats the game as if it was a movie, relying on angles, shots, color, sound, music, lighting, props, location, characters, costumes, and a variety of other variables that shape the experience of the player.

What is interesting here is that it is able to be flipped on its side. For the most part, VR throws you in the world as if you are one of the characters. You see this world as if it is your own, establishing shots, no dutch angles, and cinematics is harder to execute when the audience is part of the cinematic. Thus a new form of cinematics can rise up, actually playing out the catastrophe of the scene. Rather than having a shaky camera with dust filling its screen, through virtual reality, the player creates his own shots by looking around side to side, up and down, squinting when the sun gets too bright, and

feeling as if they are actually playing as the protagonist. Thus, a new cinematic experience is seen and created unique to each player for each to play out the way they want the scene to play out and look the way they want these scenes to look as they pan out during the cinematic. What is more interesting is the handheld controllers you get while wearing VR goggles. These handheld controllers allow you to interact with the world's objects and move as you please. Extending your hand in the real world will make your avatar's hand extend out as well. This all plays to the reality that the user is experiencing.

Conclusion

In conclusion, technologies in video games are cutting edge and always pushing the boundaries of technology more so than other technological branches. Companies like the *Oculus Rift*, the *HTC Vive* and *Sony PlayStation VR* – and Mixed Reality Interfaces (MRITF) – like the *Microsoft Hololens* all struggle to release the most interesting and advanced pieces of technology they can. Some are even taking a step further beyond; for example, *MiHoYo* has started development on a piece of technology that can upload your mind and conscience into a virtual reality world (similar to *Striking Vipers* and *Playtest*) where you can actually feel like the player in full rather than wearing something on your head. All this advancement and development to make escapism, gaming, and a whole other world for an excited player to explore.

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