

Taking Animation Project Learning into the Virtual Environment

Gray Hodgkinson
Massey University
Wellington, New Zealand
g.f.hodgkinson@massey.ac.nz
ACM Member no. 8867243

Abstract

This paper demonstrates how a team of honours-level students explored a new area of game interaction, supported by an academic structure that provided flexibility, opportunity and encouraged independent exploration. This project combines the cinematic aesthetic of film, the interactivity of video gaming and the immersion of virtual reality (VR) to create a compelling and unique visual experience, at a production quality level equal to an industry prototype. The academic structure similarly was required to show great flexibility and respond to the students needs with agility. Along this journey the students gained skills with advanced 3D modelling techniques, motion-capture, the 3D goggles Oculus Rift, the game engine Unreal Engine 4, as well as other supporting skills such as script writing and concept art.



Figure 1: *Player follows eagle in the VR environment*

1. The academic environment

Prior to their 4th year honours level of study at Massey University School of Design, the group of three students were well prepared for independent team-based study. One paper in particular focused research methodologies. In this paper the feasibility of the project was examined, taking into account capabilities of the technology and abilities of staff and students to make it work. The context of this project was established, leading on to the development of the game world, story and scenario. Finally, the research paper also gave space for the students to investigate the various theories associated with game play and virtual reality. They researched theories of presence and immersion, several theories associated with game play, and also analysed existing game/cinema examples. The third student at this time also researched the Oculus Rift and its operation with various games engines, settling on Unreal Engine 4 as the best option.

The three students also brought in four other colleagues to assist – a project director, a writer, a sound designer and a composer. Communication took place using a Facebook Project page, which included the academic supervisors. Facebook allowed for

communication to the team members who were in industry, outside of the school system. The school has its own Moodle based system, but this is only available to enrolled students.

2. Why Virtual Reality?

The contribution of VR to movie engagement is a heightened sensation of presence. The linear trajectory of the movie format is also not necessarily a limitation. In games, and game VR, there are multiple routes, sometimes to multiple outcomes. However, game interactivity is often faked – there can be an appearance of choice, but in fact the player is usually along a single pathway with a pre-determined outcome. Interestingly, the actual entertainment experience of a fake interactive story does not differ from the experience of real interaction. When users feel that they have some kind of agency, they enjoy this agency, whether the agency is real or not (Vosmeer 2014). This implies that illusion of interactivity within a VR movie may be sufficient.

3. Presence and Immersion

The term “presence” is discussed by a wide field of research, but generally refers to the sensation of “being there”. For the purpose of this project, we will focus on the physical and emotional experience created through VR immersion. Lombard and Dittion (Schuemie p184) describe immersion as “the extent to which the senses are engaged by the mediated environment”. Witmer and Singer (Witmer 1998) include the concept of involvement, “a psychological state experienced as a consequence of focusing one’s attention on a coherent set of stimuli or related activities and events.” In this way, involvement and immersion are closely related, and both are necessary to create the higher sense of presence. With VR, this greater involvement is generated by removing distraction and forcing focus into a single experience. Therefore, by creating an immersive and involved experience, the sense of presence is heightened.

With VR comes a certain level of technology, and the success of immersion comes when “... environments are perceived as if the technology was not involved in the experience.” (Schuemie p185). This is similar to the “suspension of disbelief” experienced by movie viewers. The viewer knows that the experience is not real, but willingly engages, letting many senses and emotions be guided by the experience. The more that the “Exclusive presence” (Slater et al) can be increased by reducing sensory input of the real world, the more immersive the VR experience will be.

From the background research around presence, the project team developed key principles that would need to be managed in order to maintain optimal experience for the user.

1. Control factors: the amount of control the user had on events in the VE:
2. Sensory factors: the quality and consistency of displays:
3. Distraction factors: the degree of distraction by objects and events in the real world.
4. Realism factors: the degree of realism of the environment.

The students also analysed camera mechanics, and how this affected the viewer. Of particular importance was the understanding of long duration one-shot sequences of up to five minutes long. Based on their research and play-test results, shot cuts can easily disorientate the user, as there is no way to anticipate exactly when the cut is about to take place.

5. The project

The aim of the project is for the viewer to follow the action as a spectator, an invisible camera following an eagle. The viewer path will be predetermined, although they can look in any direction they wish. This combines the narrative pathway of the story with the freedom of the VR interaction. Upon testing it was revealed that the viewers were quite comfortable being “taken for a ride”.

The pre-determined viewer path also determined the environment. Effort could now be concentrated on giving maximum quality to the aspects that the viewer could see. An entire environment was not required, just that perceived along the viewer’s pathway. The landscape needed to completely surround the viewer at all times, in convincing detail.

6. The Narrative

The narrative itself takes place in a fantastical mountainous icy world, and explores themes of solitude, danger, fear, beauty and survival. The eagle companion serves as a visual anchor giving the viewer a focus in order to reduce motion sickness. As the focal point it occasionally falls behind the viewer encouraging movement of the head and reminding the viewer to look around for themselves. Movement is at first gentle, to allow the viewer to become accustomed to the experience, but soon speeds up, as the both the eagle and viewer swoop up and down over the complex mountainous landscape.

7. Changing Perspectives

After the landscape fly-through, the eagle descends to the forest and the viewer’s viewpoint changes to a static observer on the ground near a deer. An arrow appears from the woods and kills the deer. As the viewer watches, a shadowy figure of a hunter appears, walks over the deer, and removes the arrow. At this time wolves howl, the hunter takes fright, and runs off. The viewer is witness to an event of some drama. What the VR context brings to this scene is a heightened sense of “being there” – there is a strong sensation of standing just by the deer. This is quite different from watching a movie screen from a distance – it is more like being a floating “ghost”, standing close by, invisibly observing. It is concluded that moments of drama have a different emotive affect when experienced with VR.



Figure 4. The hunter character is introduced

8. Testing and presentation

Play testing took place every week in the final 6 weeks of the project, with 4 – 6 play testers every time. This provided essential technical and behaviour feedback for the designers. The final

project was submitted to an assessment panel of 2 academics and 1 industry guest, who all experienced the project in a 40 minute session. In the following week the project was exhibited and played by over 50 people. Feedback from this last group was less formal and was largely by casual observation. Finally, the project was presented to two industry groups in small intensive meetings.

9. Viewer reaction and comments

From the time of the assessment panel onwards, all users reported a positive experience. All users became suitably immersed in the environment, to the point that they readily discussed various elements. E.g. “What is behind that tree?” From the beginning, all users would explore the experience: “Can I look behind?”. “How far can I see?” “What’s that over there?”. Once the action sped up, the conversation turned more into vocal reaction. The use of particle effects such as snow and cloud was also recognised by viewers as providing visual cues of movement through the landscape. Some viewers commented that the immersion made them feel cold, whereas others commented that it was odd that they did not feel cold.

In regards to the narrative, viewers had many questions about the huntress. While answers would be provided in a second chapter, it nonetheless highlighted some limitations of a silent observer paradigm. Equally interesting, once key characters were introduced, such as the eagle and the huntress, the supporting details such as rocks, snow and ice became readily accepted. These environmental details tended to be accepted, and move into the background consciousness. Focus was instead shifted onto the key characters.

10. Summary

All three students were quickly employed by high level industry in their respective fields. As a prototype to test this film/game/VR crossover, this project has been very successful. Viewer participation was consistently positive. The “silent observer” status of the viewer was readily accepted. The realism offered by the technology and the skills of the creators was convincing and very engaging. Overall this project suggests an exciting development to how viewers can explore, discover and engage with VR worlds, presenting an innovative approach to cinematic experience.

11. References

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Credits

Jacob Barrow – Project Director, Reuben Smith – Project Manager / 3D Artist, Alex Baur – Concept Artist / 3D Artist, Jack Nesbit – Concept Artist / Publication, Andrew Cunningham – Writer, Chris Swan – Sound Designer, Sam Logan – Composer.