FATED:

An Interactive Film with Controllable Point-of-View Camera

By

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Abstract

The crossover between videogames and film inspires this thesis. It is an attempt to integrate narrative and engagement in digital filmmaking thereby enabling active audience participation in the storytelling process. By analyzing early point-of-view camera experiments and contemporary implementation of these techniques in first-person shooter games this thesis presents the different values of point-of-view perspective in both games and films. In addition, the thesis explores the impact of film on games via the use of cut scenes, narrative structure and cinematic language in order to uncover some fundamental principles of gameplay experience. Integration of an interactive point-of-view camera technique with traditional cinematography in a linear narrative underpins the filmmaking experimentation of this thesis. By producing a participatory film, the thesis tests this mix of filmmaking techniques and audience engagement, with a result suggesting that the viewing experience was improved.

Keywords: storytelling, future cinema, videogames, gameplay experience, interactive camera, point-of-view camera, narrative structure, virtual presence, first-person shooter game, 3D animation, 360-degree filmmaking.

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To my family and Jetty.

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1. Introduction

Film, one of the most popular forms of entertainment, simulates experience and expresses beauty and other moods through a succession of still images and a mix of sensory modalities such as light, sound, and kinesthetic simulation. Filmmakers invite an audience into the illusion they create by conveying ideas, triggering emotions, telling stories and shifting perceptions. A screen is one part of the apparatus used to deliver messages to the audience. Audiences receive pre-directed information that reveals to them the filmmaker's ideas. The experience is delivered to audience members without their active participation.

In most videogames today, players engage game content directly, reacting to scenarios physically and emotionally, their actions affecting what happens on the screen. The communication between players and content is interactive and responsive.

Even though videogames and film are clearly distinguishable, there are experiments that indicate that these two mediums often share approaches to create particular experiences. One example is *L.A. Noir* (2011), a detective videogame that draws heavily on the aesthetic elements and plot patterns of the cinematic genre of film noir. Point-of-view (POV) camera, a camera technique invented for the film industry, shows what a character (or the subject) is looking at and has been successfully adopted by First-Person Shooter (FPS) games. POV is little used in the film industry, as Galloway claims, "They are marginalized in that they happen relatively infrequently within the

apparatus of filmmaking, and they only represent specific moods and situations." (Galloway 2006). After POV was adopted by the videogame industry with the first FPS game *Wolfenstein 3D (1992),* the FPS genre proceeded to successfully resuscitate POV. FPS games involve a player directly by serving up the gameplay experience through a character's perspective via the use of POV, thereby contributing to the player's active participation in an immersive and engaging experience. The role of narrative is weighted differently in films and videogames; narrative tends to disappear into the background during the game and plays as a role of weaving different chapters of gameplay contents, whereas it maintains its central role in film.

In this project, I explore an approach that merges film and videogame delivery features into an experience offering active participation within a compelling narrative.

Research Question

Given the usual passivity of viewing films, is it possible to stimulate active audience engagement and an immersive experience by merging videogames' interactive POV camerawork with the linear narrative of conventional filmmaking? Active engagement, as used here, refers to a series of self-directed, navigable POV shots offered to the audience whilst they watch the film, allowing them to explore the film's spatial environment and, potentially, have a closer interaction with the characters.

This thesis project is an attempt to innovate a technique for joining interactive POV camera shots with a linear narrative, in order to foster a more deeply immersive film viewing experience.

2. Immersion and Directedness

Terminology of Immersion

Videogames allow viewers to engage actively in the scenarios presented. As stated by Provenzo (1991): "…[Adolescents] are temporarily transported from life's problems by their playing, they experience a sense of personal involvement in the action when they work the controls, and they perceive the videogames as not only a source of companionship, but possibly as a substitute for it." Provenzo claims that players connect to characters in videogames with such deep engagement that their social needs feel sated via gameplay. Taylor further suggests that immersion can be understood as when a player is caught up in the world of the game (the diegetic level). In addition, immersion can also be seen in a player's appreciation of a game and the strategy that goes into playing it (the non-diegetic level) (Taylor 2002). Presence is another word that is often used to describe this experience, or "the feeling of being there" (McMahan 2003). Immersion itself is a much-contested term in videogame discourse. One definition of immersion from Janet Murray suggests that:

> Immersion is a metaphorical term derived from the physical experience of being submerged in water. We seek the same feeling from a psychologically immersive experience that we do from a plunge in the ocean or swimming pool: the sensation of being surrounded by a completely other reality, as different as water is from air, which takes over all of our attention, our whole perceptual apparatus…. In a participatory medium, immersion implies learning to swim, to do the things that the new environment makes possible…the enjoyment of immersion as a participatory activity. (Murray 1998)

Murray claims that the feeling of being entirely surrounded by another medium and the illusion of being in another reality makes an experience immersive. In addition, Bolter and Grusin (2000) state that "…virtual reality is immersive, which means it is a medium whose purpose is to disappear." As FPS games flourish one historical trend in their design is away from 2-D perspective and toward 3-D. "This shift in design is indicative of an overall trend to make desktop videogames feel more like virtual reality" (McMahan 2003). Bolter and Grusin also state that, traditional paintings, photographs and films, where viewers are often assumed to be located outside the medium and to access its content through an interface such as canvas or a screen. FPS games otherwise, place players a virtually created world and offer them the freedom to interact with objects in it as well as the spatial environment itself.

Following Murray's line of thought, Taylor's sense of "diegetic immersion," or what is commonly referred to as getting lost in the story, is the ongoing focus of this paper regarding the film viewing experience. "Diegetic immersion," according to Taylor (2002) means that the player, or viewer, temporarily forgets about the physical world, and has the perception of virtual presence in a digitally created world. Taylor further suggests that the level of immersion is facilitated by feelings of empathy and atmosphere, which can be evoked by graphics, plot, and sound as well as by the engagement of gameplay.

A qualitative study conducted by Brown and Cairns (2004) analyzes videogame players' feelings toward their favourite games, as well as the drivers that led them to

continue playing. Brown and Cairns propose three gradual and successive levels of player immersion: engagement, engrossment, and total immersion. In order to get to the end stage of total immersion, players must cross certain barriers between phases. For instance, investing more time to proceed from engagement to engrossment, creating a distraction-free environment for progressing into total immersion.

Brown and Cairns' work was further developed by Taylor to suggest that videogames also allow intra-diegetic immersion, meaning a player's central, active involvement in the game experience space. Taylor claims that "Diegetic immersion and intra-diegetic immersion are both subsets of the possibilities for which a player may experience a game space" (Taylor 2002). They are not exclusive forms, in some cases they are employed with different priorities. Furthermore, intra-diegetic immersion usually occurs after the player has been diegetically immersed in the game. In order to have players experience diegetic immersion, a consistent game world is needed so that they are not forced from immersion by inconsistencies in the game space. Taylor suggests that the game world needs to be consistent in narrative space, game characters, visual/aesthetic choices, and the game world boundaries (Taylor 2002).

Taylor further discusses that for players to inhabit the game space, two conditions are required: narrative context and a sense of presence in that space. Players create and construct the narrative context as they play. A plotline is often used to provide a basic narrative context, which connects the audience to social or cultural elements within the narrative (Taylor 2002). Narrative is emphasised differently in distinct videogame genres. Games like chess and checkers often do not have a narrative;

neither do they have a character to work with for creating a narrative context. *Call of Duty*, in contrast, is a fully story-driven FPS game in which the players unfold the story by playing as a character or by taking on multiple roles. In FPS games, the player is always assumed to be the protagonist; the player is often not given the choice of seeing the protagonist's face during the gameplay.

Videogames and films offer distinctly different ways to connect with an audience. Games require a player to physically control aspects of the game, while films demand only that the viewer gives attention to the film. As this project develops an interactive film that borrows videogame design approaches it is crucial to analyze the narrative context and its correlation with audiences' and players' immersion. Videogames and films generate different viewing experiences. Lukas and Marmysz (2010) write: "Films can be classified as a passive experience in terms of the viewing." Videogames, conversely, require players' active participation during gameplay. However, film is not a purely passive medium; to deliver a successful experience, a film requires viewers' cognition, comprehension, and emotional responses. Unlike videogames—where narrative may play a less crucial role—film relies heavily on narrative, plot, and characters to deliver the information and evoke its audiences' emotional responses. While narrative is not necessarily prioritized in videogames, it is getting increasing attention from game designers.

Story and Telling

Since the beginning of humanity, storytellers have provided rapt audiences with immersive experiences. The classic notion of a traditional village depicts a group of people sitting around a fire at night listening to the storytellers tell the tales of the day (Keen 2006). Regardless of the delivery technology employed, storytelling should be engaging. A cave-dwelling elder vocally captivates his listeners from the centre of a circle, a writer transports her readers to a foreign land through words arranged on paper, a director creates the illusion of time travel through filmed sounds and images, and a game designer puts the player in the driver's seat: in each case the successful storyteller imaginatively brings the audience outside of itself and into the story. Stories are often filtered through a storyteller's personal experience and used to convey ideas, opinions and perceptions. The story may originate in the tellers' own experiences or in those they learned from others. Successful storytellers enrich the narrative with expressions of their own understandings and emotions, thus drawing their audiences further in.

Audiences' experiences differ according to their understanding and interpretation of the content. One individual's emotional response to a 7-foot tall hero with a muscular body is likely to be different from someone else's. Thus, the audience and the storyteller together create a completely individual immersive experience. That leads us to a series of questions: How has the audience allowed themselves to fall into and be led by a narrative? How does the audience come to identify with characters?

And, how does the audience members feel themselves responding emotionally to those characters within the story?

Audience Empathy

Empathy is an important concept in experiencing immersive storytelling. Keen states that "*Empathy,* a vicarious, spontaneous sharing of affect, can be provoked by witnessing another's emotional state, by hearing about another's condition, or even by reading" (Keen 2006). Storytelling can inspire empathy, through a character, a narrative or both. By mirroring what a person might feel in a situation and connecting audience members with the contexts in which the story takes place, storytellers help audiences travel through a narrative, mimicking the emotional states of the characters.

Character identification is often discussed as the most common generator of empathy in narrative fiction. According to Keen, "Characterization such as naming, description, indirect implication of traits, roles in plot trajectories, and modes of representation of consciousness may potentially contribute to the character identification as well as influencing empathy" (Keen 2006). From another perspective, Vorderer, Steen and Chan (2006) define entertainment as a process that "involves the exploration of relationships through simulations that permit individuals to identify with substitute agents that thus create the subjective experience of relationships." From this perspective, identifying with a character is often the audience's entry point to a story or other form of entertainment.

Taylor argues that a sense of presence in a narrative space is crucial for an immersive experience. In many videogames, players have a visual representation in the game, revealing their presence within the game space - either via a third-person avatar figure or a first-person POV camera view with a hand or hand-held object in the center of the screen. Many FPS games also include kinaesthetic representation of one's character's movement. For instance, the camera movement reveals the body movement of the character. The visual representation helps players to identify themselves in the game. It signifies the player's embodiment in the game space, and causes them to empathize with their chosen character. Taylor further emphasizes that the visual representation should be consistent; multiple body representations are not suggested unless the narrative is addressed in that way. Thus, in many videogames, the player follows one protagonist in the story throughout the overall game. The choice of perspective in this project is consistent with Taylor's (2002) view, in that the story is narrated only from the perspective of the leading actress.

Along with character identification, narrative situation supports character identification and viewer empathy. Keen (2006) describes narrative situation as "internal perspective" that is achieved by "first person self-narration, third person narration, or through authorial narration that moves inside characters' minds." Keen explains the narrative situation from the following perspectives, "The nature of the mediation between author and reader, including the person of the narration, the implicit location of the narrator, the relation of the narrator to the characters, and the internal or external perspective on characters" (Keen 2006). In novels, narrative

elements such as length, genre, setting, and pace are used to contribute to audience empathy. In addition, the person who narrates the experience seems to have a strong impact on the reader's emotional response. For example, first person fiction, in which the narrator describes his or her own experience and perception by using "I" or "we", is thought to trigger a closer relationship between the audience and the voice of the narrator. Novelist and literary theorist David Lodge explains first person fiction and its appeal to the audience:

> In a world where nothing is certain, in which transcendental belief has been undermined by scientific materialism, and even the objectivity of science is qualified by relativity and uncertainty, the single human voice, telling its own story, can seem the only authentic way of rendering consciousness. (Lodge 2004)

First person narration can supplement character identification by evoking emotional coherence, creating an illusion of reality where the character and audience are merged. This absorption does not only happen in books. In film, there are examples in which first-person narrative is translated into POV camera work that allows the audience to view the narrative context through the eyes of a particular character. In videogames, First-Person Shooter (FPS) games in particular give audiences control of the character. Players control their avatars and drive the story through multiple combats and action scenes. In videogames, the player is considered the audience as well, experiencing the whole story by playing a part in the narrative. Usually the player is centered in the narrative, which progresses through the player's actions. The first-person narrative is thus rendered by the player's experience as central characters in the gameplay.

The previously cited example is the First-Person Shooter (FPS) game, a genre of videogames that visualizes first person narration and furthers the experience by allowing players to control the character completely. The story is driven by the player's participation. Furthermore, such videogames enable the possibility of narrative branches by creating an interaction that allows players to choose their own path. Players' actions and decisions potentially lead the narrative into another branch, like in *Mass Effect 3 (2012),* where player actions result in alternate endings. Videogames such as the *Uncharted* series (2007-2012), the *Metal Gear Solid* series (1998-2014), and the *Halo* series (2001-2014) are iconic, story-driven FPS games that offer a story world wherein players are motivated to unfold and progress the story with their actions.

This discussion of audience empathy has inspired the development of this thesis project. The narration in the first person voice and interactive POV camera were employed to evoke deeper audience empathy. The intention of using the first person narration will be elaborated later in this paper. The narrating character of the story shows the player the world through her point-of-view; the player, then, can control which aspects of the world the narrator inspects using the similar camera control as is used in FPS games, which only makes the rotation of the camera controlled by audiences. These efforts are intended to bring the audience and the character closer to each other by merging their viewpoints and physically and emotionally connecting the audience to the character. The brief discussion here about immersion and audience empathy establishes the foundation of this research project, which is concerned with how audiences relate to characters and narrative in an immersive experience. The

project strives to improve the film viewing experience by making it active, through videogame-like player involvement. The following discussion about the intersection of films and videogames is aimed to illustrate that these two media may be merged to produce a hybrid entertainment format.

3. Cinematic Crossover

Cinematic Storytelling in Videogames

Up until the mid-90s, game console hardware limitations meant that effective storytelling tools for videogames were constrained to a core set of styles, dialogue boxes and sound design. These played significant roles in defining the atmosphere of the gameplay. Eventually, devices with 3D rendering capability, such as Sony PlayStation and the Sega Saturn, offered developers a chance to tell videogame stories using cinematic techniques. Employing cinematic tools such as editing and camera movements, game developers were able to deliver gaming experiences with relatively high quality, dramatic graphics and sophisticated gameplay.

The immersive interactivity of today's videogames gives them the potential to be among the most powerful storytelling tools available, especially if the focus on narrative can be strengthened. The following sections explore the tools designers use to create narrative contexts for their games.

The Cut Scene

> The montage—a technique in filmmaking that edits a series of shots into a sequence to condense time, space, and information—was perfected by cinema, has diminished greatly in the aesthetic shift into the medium of gaming. (Galloway 2006)

Games are often designed to require continuous player engagement with the content. Players drive most gameplay except during cut scenes, where the director offers contextual information. However, in some special cases, montage still flourishes. Galloway (2006) states that: "…montage exists between different modes of gameplay, such as switching the display mode from POV to night vision goggles, a telegram, or a sniper rifle." Within gameplay, the absence of montage is necessary to keep the experience fluid. Film, on the other hand, is often a fragmented and narratively driven experience, wherein time and space are compressed for the viewer.

"A cinematic is the walkway between a film and the game." claims Franck Lambertz, Visual Effects Supervisor at Moving Picture Company (MPC). "It should be a moment to get the player into the right mood for the game." (Henderson 2014). In story-driven videogames, cinematic cut scenes play an essential role in the entire gaming experience. Cut scenes connect the player controlled and the pre-directed portions of the game. When a player's attention is detached from the storyline by focusing on overcoming obstacles, the cut scene pulls the player's attention back to the story and furthers the plot. In games such as *The Last of Us (2013),* and *Uncharted series* (2007-2012) (figures 1 and 2), the production studio employed cinematic techniques in developing the cut scenes.

Figure 1 *The Last Of Us*, Naughty Dog, 2013

Figure 2 *Uncharted 4*, Naughty Dog, 2014

The camera techniques, editing, actor performance and sound design are professionally produced at Hollywood film levels. Techniques of film cinematography are used to make cinematic cut scenes in videogames, such as the close-up (figure 3 and

4) and the two-shot (figure 5). Technologies such as motion capture, which captures the real actor's performance for use in animating a game character, help the game characters to deliver an authentic acting performance. Similarly, as Henderson states, in the cinematic cut scenes for *Assassin's Creed IV: Black Flag (2013)*, the cinematic language was translated into the gaming world in a natural progression (Henderson 2014). Game designers are using different types of camera shots, editing techniques, sound design, and characters' performances in videogames such as *The Last of Us* as they embrace the cinematic style of storytelling. Even though videogames and cinema operate as different forms of media, as Henderson explains, "The emotional aspects of both disciplines are what make them such a dynamic pairing, it is great when the two mediums meet and morph their unique attributes into a new entity" (Henderson 2014).

Figure 3 *Uncharted 4* cinematic cut scenes, Naughty Dog, 2014

Figure 4 *Assassin's Creed: Black Flag* cut scenes, Ubisoft, 2013

Figure 5 *The Last of Us* cut scenes, Naughty Dog, 2013

Evan Skarin states in his paper, *Cutscenes, Gameplay, and Perceived Player Immersion,* that there is a give and take relationship between the player and the game,

in which the player is in charge of moving forward towards the next checkpoint, subconsciously in the hope that control will be temporarily taken (Skarin 2010). The loss of control can be treated as a release or reward as it feeds the player with more story information and advances the plot. As Skarin states, "…the player creates the narrative through a give and take relationship between control and lack of control over the scene, but does so without taking the player out of the experience of playing the game" (Skarin 2010).

All of these attributes—in-game cut scenes, photo-realistically rendered graphics, compelling storyline, and game mechanics—work together to form an immersive gaming experience. *Naughty Dog*, the company behind both *The Last of Us* (2013) and the *Uncharted series (2007-2012)* is famous for its unique approaches to cinematic storytelling in videogames. The integration of cut scenes and actual gameplay work together organically, allowing the player to be a part of the narrative while the storyline stays on course. Josh Scherr, veteran lead cinematic animator at *Naughty Dog* discusses their strategy with cut scenes: "If you created compelling characters and a fun world for them to be in, players are not going to mind having control taken away from them briefly while the rest of the story plays out". (Henderson 2014). Moreover, he added, "That's what we want to do at Naughty Dog – make cinematic cut scenes that people don't want to skip." (Henderson 2014).

The implementation of cut scenes has a long tradition and different types of in-game cinematic have been developed to serve gameplay in various scenarios. Live-action cut scenes, animated cut scenes, and interactive cut scenes are three typical

types employed within many videogames. Among them, the live-action cut scene is the one that shares the greatest similarity to film, which uses fully constructed sets and real human actors for the portrayal of characters. This directly reflects the crossover between videogames and films, as well as the attributes these two media borrow from each other. Cut scenes may also be used as a way to create conflict between gameplay and narrative, or to interrupt the gameplay. The aesthetic incoherence between active participation and a pre-produced sequence is disruptive for some players and pulls them out from the enjoyment of gameplay itself. On establishing that cut scenes drive the story as well as provide essential plot evidence, the question is where and how to make the transition from gameplay to cut scene fluidly and without sacrificing the player's immersion? How can we design a videogame narrative structure that blends gameplay and cut scenes naturally?

Quick Time Event (QTE) is a form of cut scene that allows players to react with in game actions to the appearance of an on-screen prompt in a short given time. During the QTEs, players are given limited control of the game character by pressing buttons or manipulating joysticks. Players are required to perform the instructed prompts properly otherwise the game results in an immediate game over. Critiques about QTEs are varied: IGN reviewed the game *Shenmue* (2000), for which the QTE technique was initially invented, stating "QTEs seamlessly flow from cinema to the QTE sequence without any loading pauses at all. This fusion of cinema to gameplay truly makes the game feel very movie-like, especially since these QTEs are shown from various cinematic positions" (IGN 2000). The QTE also received critiques stating that the QTE turned game

interactivity into a job (Hoggins 2009). Although players react differently to the use of the QTE in videogames, it nonetheless demonstrates one method of making a seamless transition from cut scenes to gameplay.

Videogame Narrative Structure

In early days of the medium, videogame designers had to get creative with their approaches to establishing the gaming mood and introducing the background information, due to low processor power and storage capacity. Those limitations presented problems in the animated cut scenes: the pre-rendered footage generally had a higher quality than in-game graphics. That could be disruptive for players. For instance, because the cut scenes and in-game play used different quality of characters' models, players may have had difficulty recognizing the characters such as the main character in *Final Fantasy VII* (1997) Cloud Strife (figure 6). In addition, pre-rendered footage was not adaptable to the state of the game; in this case, for instance, the character in cut scenes wore different cloths than during gameplay and the character customization was not reflected in the cut scene footage.

Figure 6 Cloud Strife in Final Fantasy VII, gameplay graphic (Left), cut scene (Right)

In the first release of the videogame *Half Life,* the first five minutes of gameplay offered a background introduction presented with an in-game cut scene format: the player was constrained in a train heading to a research institution, with a radio broadcasting story information. The player could walk inside the train but could do little else until the train reached its destination (figure 7). After this opening sequence, no other cut scenes were included until the ending. The player was actively engaged in the content the entire time. On one hand, the gameplay felt fluid; on the other hand, the plot was not clearly explained. The player's attention is shifted to overcoming problems, completing objectives, and combating with enemies. Without cut scenes, the motivating storyline got lost. This example demonstrates the importance of cut scenes and their placement in videogame storytelling. Skarin states that cut scenes drive the plot forward and add to the player's immersion (Skarin 2010).

Figure 7 *Half-Life* opening sequence, Valve, 1998

Game production studios like Naughty Dog have brought storytelling into the heart of their creative ethos (Henderson 2014). Some game designers want to deliver stories with the same impact on their audience as a film. As a result, their games adopt film narrative structures and tell stories in cinematic sequences. This thesis examines the impact of cut scenes to gameplay and their relationship to the narrative structure. A cut scene is an entry point; it functions at the border between games and films. The placement of the gameplay and the cut scene is crucial, since it determines how the player approaches the story or the content. The discussion about using cut scenes to build a narrative structure in videogames suggested to me some of the means for developing narrative structure in this project prototype.

The narrative structure discussed in this paper is linear narrative; interactive narrative structure is beyond the scope of this project. Robert McKee (2006) mentions in his book, *Story: Style, Structure, Substance, and the Principles of Screenwriting,* three basic narrative structures in linear story: the classical structure, the minimalist structure, and the anti-structure. Most videogames employ the classical structure that dominates Hollywood cinema and many storytelling traditions. The classical structure, which is also referred to as the 'The Hero's Journey', was initially articulated by Vladimir Propp (1928) and Joseph Campbell (1949). As Majewski states, the classical structure best reflects most videogame playing experiences. Most story-based, linear narrative videogames restrict the player's options to influence the narrative in order to maintain the storyline linearity (Majewski 2003). Writing about this structure, Dunniway writes that the "hero's journey offers the most conflict, action and suspense. In the most basic sense, a hero's journey is a trip that a central character goes on in order to resolve a problem" (Dunniway 2000). He also writes that the hero's journey is often utilized because of its simplicity, "As a game designer it allows us to utilize a known mechanism or formula within our games that people will understand and associate with easily." (Dunniway 2000). However, some game developers are also being experimental about the story structure of their games, such as *Mass Effect 3* (2012), offer players the option to select outcomes under varied conditions or to experience alternate endings depending on the player's choice of action. In total, *Mass Effect 3* includes eight endings that may result from thousands of choices players make throughout gameplay. In such games, the story

structure shifts away from classically structured narrative, towards minimalist structure or anti-structure.

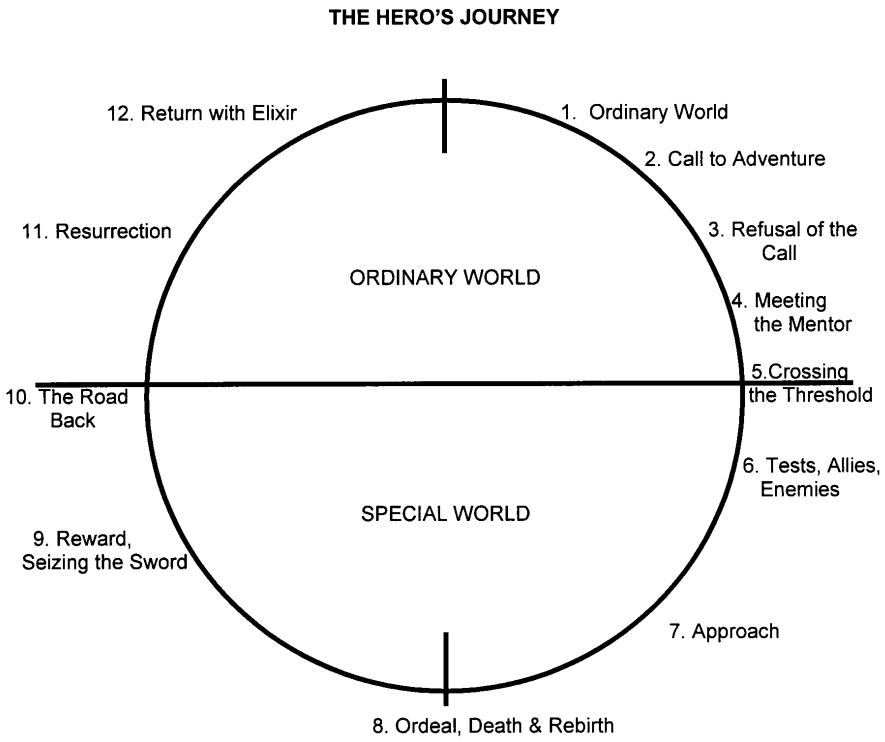

Figure 8 Hero's Journey diagram, from website *Hero's Journey*, http://www.thewritersjourney.com/hero%27s_journey.htm

The classical structure is a storyline sequence that divides the overall plot into three acts, describing the different stages of the so-called Hero's Journey (Campbell 1949): the first act, wherein the conflict is established; the second act, wherein the implications of the conflict is revealed; the third act, which includes the resolution and completion of the conflict. This model is widely used for designing a high level framing narrative for computer games. The three-act model can be applied to the overall gameplay experience, as well as to each individual level.

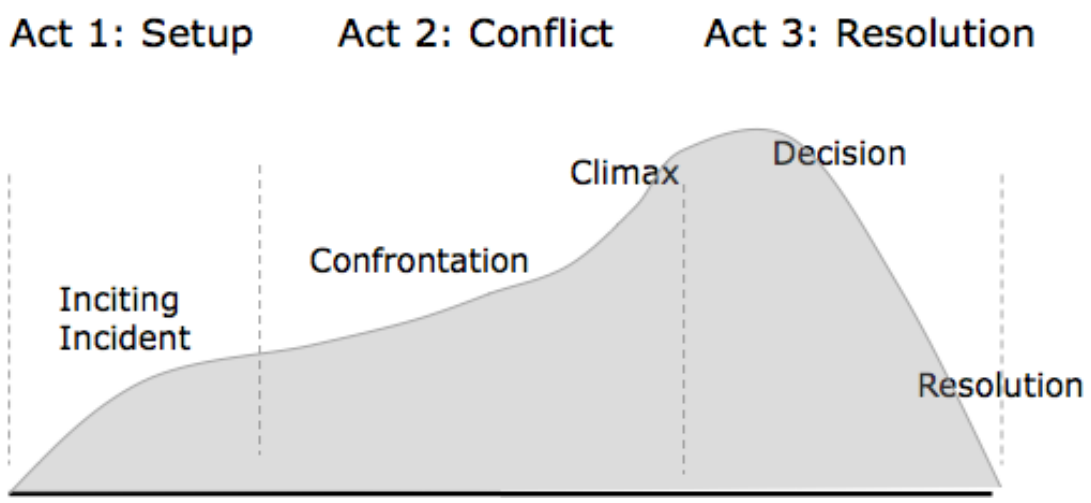

Figure 9 Three-act narrative structure diagram, source:

http://research.northumbria.ac.uk/support/2012/10/23/telling-a-good-story-impact-case-studies-as-narrative-arc/

As discussed earlier, cut scenes are often used to further plot and connect the levels in videogames. In the three-act narrative structure, the first act will often be a cut scene to introduce the central conflict and to present background information on the narrative world. For instance, the opening of the videogame *Uncharted 2: Among Thieves (2009)* starts with a cut scene animation that players see from the first person perspective of Nathan Drake, the protagonist sitting inside a train; then the camera cuts to a close-up of the Nathan's face showing that he is completely lost and disoriented. As the camera moves further from his face, players then realize that the train is hanging vertically from a cliff and is about to fall (figure 10). This example demonstrates how a cut scene can establish the mood and get the player into the story world quickly and effectively. Typically, the first act and the end of the third act are offered via cut scenes,

the second act serves up interactive gameplay before landing on the final resolution in the third act as the end of the gameplay is reached.

Figure 10 *Uncharted 2: Among Thieves* opening, Naughty Dog, 2009

Besides the videogame's adaptation of narrative structure from film, game production also takes camera languages and techniques from conventional filmmaking particularly in cut scenes, as we have discussed. When the footage is pre-rendered, game designers are able to use camera techniques such as close-up shots, long shots, and point-of-view shot to present sequences in a cinematic style.

The *Medal of Honour* series (1999-2012) and the *Call of Duty* series (2003-2014) both employ filmmaking techniques and classical narrative structure in delivering an intensive gameplay experience. This type of videogame has also had an impact on cinema, influencing filmmaking approaches for the action, thriller, and science fiction

genres, as can be seen in action movies such as *Act of Valor (2012), The Matrix (1998), Tron (1986)* and *Tron: Legacy (2010). The Edge of Tomorrow (2014),* directed by Doug Liman, featuring Tom Cruise, is another movie that influenced by the videogame's narrative structure and the level concept. *The Edge of Tomorrow* is set in a near future, where the protagonist Cage (Tom Cruise) accidently obtains the power to reset time after he is killed. This film borrows the "save and load" function from videogames, with which players can re-start from a previous checkpoint whenever they get killed. Every time Cruise's character dies, he is able to return to a point of safety, allowing the narrative to progress further with each new awakening. *Inception (2010),* by director Christopher Nolan, borrows the level concept from game design; each level in the dream sequence operates in an individual narrative space. The four distinctive levels of dreams are penetrated by a linear storyline. According to Keen, it is crucial to maintain the storyline within the same narrative situation in order to invoke audience empathy (Keen 2006). But *Inception* breaks the rules and successfully integrates game design techniques into a conventional film storytelling structure.

Slater points to the blurry line between videogames and films: "It's almost a symbiotic relationship, with games taking the best that Hollywood has to offer and re-purposing it for an interactive medium, and movies adding videogame style flourishes to their output" (Slater 2012). Film techniques add to videogames' visual aesthetic and enrich their output. Although the desire for full convergence between these two mediums remains unfulfilled, the boundaries between the two forms of entertainment are blurring (Slater 2012). This thesis has discussed some of the ways in which

videogames have learned from movies to improve storytelling methods. Cut scenes are used to convey information and provide a break in gameplay. Moreover, the discussion about the videogame's narrative structure reveals how gameplay and cut scenes can be woven together organically within a narrative context. This thesis project focuses on interactivity within pre-directed content. The analysis of cut scenes and narrative structures informed the project's design of the interactive POV with the filmed content.

Camera Languages in Films and Videogames

As an emerging medium, videogames have grown in popularity to become one of most successful sources of mainstream entertainment. Active participation by players offers new territory to explore and engage. Having developed strategies and principles over several decades, videogame design increasingly influences filmmaking in certain key ways. *The Matrix (1998)* features Neo's training scene, when he connected to the Matrix for the first time, which resembles the opening tutorial level design in a videogame, often used to introduce the control frameworks to a player. There are many ways that a game incorporates a training level: It can be part of the narrative, such as in *Metroid Prime (2002)*, or disconnected from the story, such as in the *Half-Life* series. In *The Matrix*, Neo has to complete the training before he can be plugged into the real Matrix. As Galloway states:

> …beyond the transfection of gamic conventions into film narrative, there also exist several instances, in this movie and others, where specific formal innovations from games have migrated into the formal grammar of filmmaking. This could be called a gamic cinema. (Galloway 2006)

Perspective and Point-of-View

"In film, the camera is the 'eye' of the audience, and the spectator sees only as much of the action as the camera sees" (Lightman 1946). The way the camera observes the scene is central to how an audience will perceive the film. "Camera movement has a profound influence on the way films *look* and the way films are experienced and engaged with by spectators" (Nielsen 2007). The director is responsible for stitching these camera shots together in sequence, in order to make an authorial comment on the role and importance of the camera in that film. In addition, the director chooses camera angles that best represent and convey their ideas fluidly through the story. A camera helps the audience to identify their senses of time, space, and speed in the narrative, reveals to them the information that was previously off-screen, and leads audiences' attention during the film (Nielsen 2007).

Film and videogames make their mark on each other in other significant ways. Just as videogames adopt camera techniques from cinema, films adopt videogames techniques such as camera use, machine interface, and HUD display. For example, the camera placement in racing scenes in the movie *The Fast and Furious (2001)* evoke racing games like the *Need for Speed* series *(1994-2013)*. Another example is the film *Gamer (2009),* which depicts a world where participants of an online game can control real human as characters in the game (figure 11). More interestingly, after the first person shooter (FPS) games successfully adapted the POV camera and popularized an intensive style of gameplay experience, film directors realized the unique feature of FPS games and brought POV camera work back to film, modified via videogame approaches.

Act of Valor (2012) is an action movie featuring cinematography using point-of-view shots to capture the battle from a SEAL's perspectives (figure 12). The aesthetic element in *Act of Valor* resembles to the FPS game *Call of Duty* (figure 13).

Figure 11 *Gamer,* Lionsgate, 2009

Figure 12 Film *Act of Valor*, Relativity Media, 2012

Figure 13 ***Call of Duty 4: Modern Warfare*****, Activision, 2007**

Whilst the POV camera was only occasionally used in traditional filmmaking with and only very few films using the POV camera as a single subject position for the entire film, videogames, especially FPS games took it up and expanded the use of POV shots in the game industry. In addition, POV no longer functions just as an apparatus but grown into the principle behind particular gaming experiences. FPS games modified the POV perspective and popularized it in the game industry. This in turn brought the customized POV back to filmmaking where it had been originally invented.

In *Projecting a Camera: Language-Games in Film Theory,* Branigan suggests that: "A camera may appear more or less subjective, more or less objective" (Branigan 2006). Camera theory can be applied to videogame design as well; carefully coordinating camera movement, point-of-view, frame, lens and distance deliver the best gaming experience. For instance, in FPS, the POV camera increases intensity. Viewing

destruction through a narrow field of vision allows players to feel closer to the characters than viewing it through a sweeping camera. POV shows the audience exactly what the character sees. In games such as *Call of Duty*, *Medal of Honour*, and *Battlefield*, the camera actively moves through the scene under the player's control, following the rhythms of the fictional character's body. This merging of the player's and character's vision and action creates an illusion that the player is present inside the virtual environment.

This thesis argues that players feel closer to protagonists in videogames than audiences do viewing films because in games, the player acts on and with the character in real time. Videogames offer a responsive system within a navigable, computer-generated environment; players get to control the character and explore the spatial environment at will. The player's input is reflected into the character's actions: looking to the left or right, for instance, when the player indicates direction with the controls. In cinema, though there might be the desire to engender a subjective narration by the viewer, the power of the POV camera to connect viewer and character is limited by the constructed, non-interactive nature of film.

This thesis project addresses the interactive POV camera in a linear narrative, in particular exploring the possibility that adding interactivity to POV in film will deepen viewers' immersive experience. In the next section, I evaluate POV's value to and uses in films and games.

4. The Importance of Point-of-View Perspective (POV)

As Nielsen states, as the camera plays an observer or a spectator in films; it is a participant in the action (Nielsen 2007). Indeed, cameras help audiences to obtain access to the world of the film through the lens of a character. The POV camera helps audiences identify themselves in the narrative through a character's line of sight, presenting that space to viewers. The camera's and character's fields of vision merge. A single character's movement leads the camera, both visually and physically. In doing so, the camera acts like a bridge that connects the audience and the character. Furthermore, when the camera attaches to the vision of a single character, momentum and rhythm of body movement are transferred along with sight (Galloway 2006).

The discussion of POV camera supports the structure of the prototype of my thesis project. In the development of storytelling in videogames and films, the next step is to achieve convergence of the two entertainment forms' immersive and narrative appeal. The project seeks specifically to create that convergence and explore its value. The following review of the history and importance of POV, and its crossover from film into videogame narrative structures, provides background that undergirds the thesis project design.

Narrative Function of POV Camera

Narrative theorists, literary, film, and games critics, and reading specialists have all discussed important narrative techniques, such as first person narration, third person

narration and the interior representation of character's consciousness and emotional states (Keen 2006). These techniques have been used to engender empathy by supporting the audience in identifying with the character's perspective. Authors use words to share characters' feelings, observations, thoughts, and motivations with readers, filmmakers employ the camera. In both of these media, first person narrative gives the reader or the viewer access to the story through the lens of one character's perspective, as imagined by the author or director, inviting readers or viewers to experience the plot as that character does and thus, as if it is their own story. First person narration, demonstrated by the possessive pronouns "I" and "we,' may present the protagonist's perspective or that of a secondary character relaying the story as they observed it, such as with Dr. Watson's narrations of Sherlock Holmes's cases. The information from first person perspective is filtered through only one character's understandings; since is not entirely objective, it imbues the narrative with the character's emotional states at that time, offering the experience the writer or director wants the reader or viewer to have. Suzanne Keen wrote about the first person narrative function and empathy in her work *A Theory of Narrative Empathy*: "…within the category of first person narratives, empathy may be enhanced or impeded by narrative consonance or dissonance, unreliability, discordance, an excess of narrative levels with multiple narrators, extremes of disorder, and or especially convoluted plot" (Keen 2006). She also discussed how first person narrative functioned to support character identification and empathy. First person POV fiction invites an especially close relationship between readers and narrators (Keen 2006).

A human voice, telling its own story, can be seen as an authentic way of rendering the narrator's consciousness (Lodge 2004). In essence, The POV perspective in film works similarly to the first person book narrative, where experiences are shared through the protagonist's (or another character's) perspective. The POV camera adds a sense of authenticity to stories, giving verisimilitude to the narration through a person's subjective perspective. The first person narrative tells a story in the narrator's voice; the POV camera shows it unfold through that character's eyes. The POV both invites and echoes the viewers' empathy, thereby forming a bond between audience and character. As discussed in previous sections, identification with a character is crucial to conjuring audience's empathy, narrative immersion, and revelation of the character's cognition. The use in film narrative of POV shots that include active engagement may heighten the viewing experience. Because it provides audiences an identical perspective to the protagonist's, first person POV visually contributes to empathy and character identification. While some in the film industry have experimented with POV camera integration in traditional filmmaking, POV is only used briefly and partially in some mainstream films; for some viewers, the cinematic environment's use of POV does not engender the same level of closeness and connection that it might in videogames. This thesis further discusses the benefits of POV in audience immersion, below.

POV in Cinema

Although videogames popularized the point-of-view shot, the shot itself was firstly introduced in cinema. *Grandma's Reading Glass (1900)* by director G.A Smith was

the first film to introduce the use of POV close-up shots (figure 14). *Grandma's Reading Glass* was also the first film to feature the cut between medium shot and point-of-view close-up (Brooke 2003).

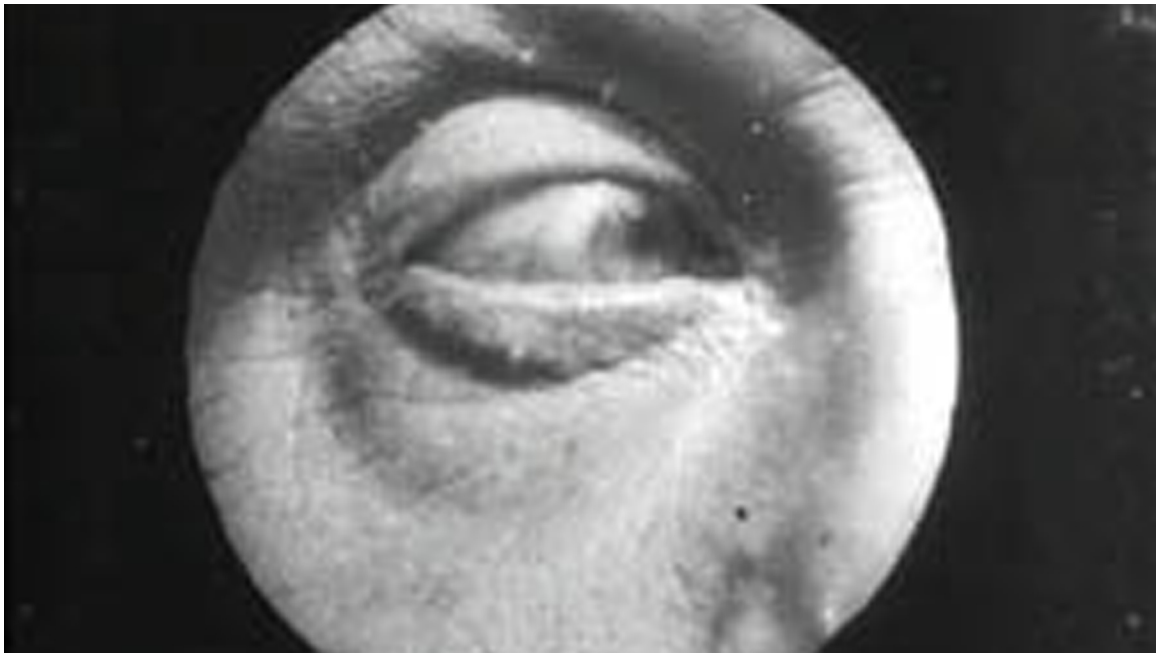

Figure 14 *Grandma's Reading Glass*, 1900

"The Lady in the Lake" (1947)

While most FPS games successfully deliver players a sense of presence in virtual worlds by using POV cameras, the experimentation of applying POV camera techniques in films has not been as successful, as can be witnessed in a 1947 movie *The Lady in the Lake* by director Robert Montgomery, which experimented with using POV shots throughout the entire movie (figures 15). *The Lady in the Lake* based its cinematography exclusively on the use of POV camera. In the film, the camera became one with the main character, merging with the protagonist. Audiences were only able to see what the character sees. Metro-Goldwyn-Mayer promoted this film and claimed it a revolutionary

kind of filmmaking. The overload of POV shots made audiences have problems identifying the character. Critics at the time called the movie "…more tiring than fascinating" (Galloway 2006).

Figure 15 *The Lady in the Lake*, 1947

"Dark Passage" (1947)

Following the experiment with POV camera in *The Lady in the Lake,* director Delmer Daves also explored making a film using the first-person camera in the noir film, *Dark Passage* (1947). Resembling *The Lady in the Lake, Dark Passage* was also noted for its cinematography: concealing the face of the character behind the camera for the first half of the movie. At first, the audience saw the space and narrative only through Humphrey Bogart's perspective. Audiences had no context for Bogart's character in the movie, and had to follow along through point of view, even as he was conducting a crime. Vicky Vengeance wrote about *Dark Passage*: "There is a mingled horror and

pleasure in taking on the perspective of someone beating another person and you feel the terror of being captured by the police in an extremely visceral way" (Vengeance 2008). After Bogart's character got plastic surgery and changed his appearance, the camera work moved outside the character's perspective. "Suddenly, we are outside and can look to the character's expression and mannerisms and read the subtler cues underneath the lines he delivers" (Vengeance 2008). Comparing to *The Lady in the Lake*, which had issues such as static camera movement and inconsistent performances of actors trained to avoid looking into the camera, "Daves overcame these problems by creating movement in as many of the first-person scenes as possible, and by interpolating third-person scenes whenever he can hide Parry (Bogart's character) from view" (Malcolm 2006).

Figure 16 Dark Passage, Warner Bros., 1947

“Cloverfield” (2008)

The Lady in the Lake is not the only film that experimented with producing the whole film in POV shots. *Cloverfield (2008)*, an American science fiction monster film directed by Matt Reeves, featured stylized cinematography including fictional footage from a personal video camera recovered by The United States Department of Defense (figure 17). Public reactions to *Cloverfield* were also varied. Marc Savlov of The Austin Chronicle said, “Telling the story through the lens of one character’s camera worked fantastically well” (Savlor 2008). After the screening, some audiences reported that they had motion sickness while they were watching the film, including nausea and a temporary loss of balance. Whether or not this film was a deemed a success, its camera work clearly triggering physiological reactions in its audiences.

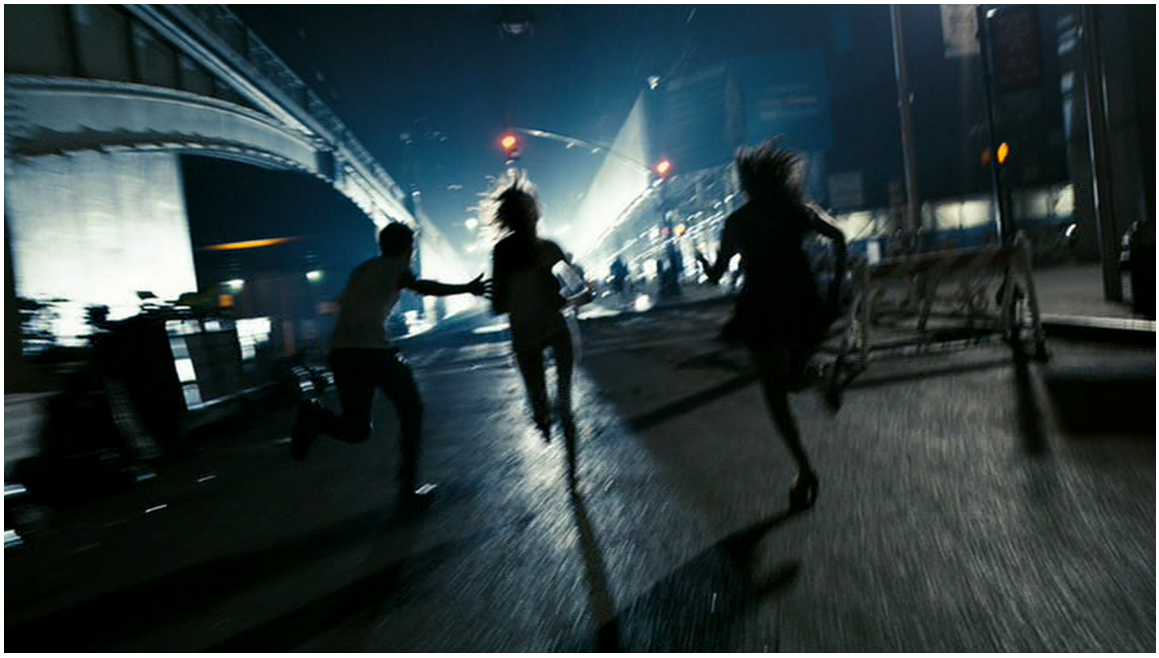

Figure 17 *Cloverfield*, Paramount Pictures, 2008

POV Camera in Hitchcock's Films

Alfred Hitchcock was pioneering in the use of POV camera in cinema and almost all of his uses of POV produced strong stylistic effects in his movies. Hitchcock's work reflected his commitment to the subjective exploration of psychology. The viewpoint from a single character's perspective reinforced his wish to express the mental state or the subjectivity of them. For example, in *Vertigo* (1958) Hitchcock presented audiences the shots from Scottie's point-of-view to convey his fear of height and disorientation (figure 18). Besides displaying the visual disorientation of the character, Hitchcock also used the POV to emulate the condition of the character for audiences. In the car-sinking scene from *Psycho (1960),* Hitchcock moved audiences' empathies from the victim to the killer by cutting between the cars slowly sinking in a swamp (the killer's viewpoint) and the close-up of the murder's face. When the shiny car roof remained visible above the mud and the alarm bell from a police car was approaching, the killer panicked and so did the audience (figure 19).

Figure 18 *Vertigo*, Paramount Pictures, 1958

Figure 19 *Psycho,* Paramount Pictures, 1960

POV shots can be found in most of Hitchcock's movies such as *Rear Window* (1954), *Notorious* (1946), and *Foreign Correspondent* (1940). But in those examples the POV camera was only partially used and each shot only lasted for few seconds. It was not used as a single device to carry the entire movie unlike the POV in *The Lady in the Lake.*

Passive and Directed Participation

Despite use of first person POV camera work, there remains a detachment of identification of the audience for the main character in both *The Lady in the Lake* and *Cloverfield*. The nature of film is problematic in merging the character and the audience because the camera lens only offers pre-directed movements. The actors did not necessarily behave in the way that audiences wanted them to, and though visually merged with the characters, the viewers had no visual information about the characters' inner cognition and no say over their choices.

> There is therefore a misinterpretation here that fails to understand that it is not the site of the subject that the camera operates, but at the place of the Other… We cannot identify with someone whose face is always hidden from us. And if we cannot identify ourselves, we cannot share the anxieties of the character. In a thriller this can become rather annoying. (Bonitzer 1981)

In *Cloverfield*, the person who holds the camera is out of the frame for most of the shots. The camera operator aligns his point-of-view with the audience, trying to show audiences what he sees and feels. According to Galloway (2006), the lack of control on the part of the spectator creates in the viewer a sense of being distanced from the character. Aligning the point-of-view with the viewer does bring viewers a sense of immediacy, but the lack of agency over the character frustrates empathy and immersion.

A recent notable example of first person POV in film is the animated movie *Doom (2005)*, which contains a 10 minute POV shot that shows the audience what the main character sees while venturing through hallways shooting and killing aliens (figure 20). *Doom* was originally conceived and produced as a first-person shooter game back in 1993 (figure 21). It is considered to be one of the most significant, influential titles in the game industry, second to none in popularity (Chaplin 2007). The *Doom* movie franchise sought to mimic the popular video game's powerful use of POV shots by translating them to film.

Figure 20 *Doom*, Universal Pictures, 2005

Figure 21 Videogame *Doom*, id Software, 1993

POV Methodology

POV has been successfully adopted by videogames from film, and has returned to the cinema with lessons learned from videogames. The question comes as why POV is still favoured by videogames but marginalized by cinema? And how does POV function to enhance the gaming experience?

Constructing Virtual Presence

> Perspective shapes the player's perception of the game space because its tactility encodes the vantage point from which the player acts on and engages with objects and actors in the game world. (Taylor 2002)

Players in videogames acquire spatial perception from the perspective from which they move within and navigate the game world. Depending on the genre of game, the perspective that is chosen can be varied. For example in strategy games, such as chess, checkers and tower defense, for example *Plants vs. Zombies* (2009), the point-of-view gives the player an birds-eye view of all the action, intentionally distancing the player from the objects and providing a sense of complete control over the game. In this scenario, the player acts as one who is omnipotent: above the action and able to control the entire assemblage of characters or objects. According to Taylor "…perspective—defines the way in which we become the force—the input we can contribute—and also the power given to us in games" (Taylor 2002). When we are given the birds-eye view, we are aware of the power that is given to us. The player may be described as "God" within the game, far more powerful that a mere a character.

Taylor reviews the roles third- and first-person points-of-view play in constructing the game context. In the third person point-of-view, a player is given a graphically represented embodiment within the game space. Similarly, first person point-of-view is often enhanced by the character's holding an object on screen, indicating the player's/character's presence in the virtual world. "First person point-of-view seems to promise the best sense of and engagement with the space because optical perspective is closer to that of normal optical subjectivity than other perspectives" (Taylor 2002). First-person perspective represents what the character sees through his or her own eyes, and may be the most "natural" and intuitive vehicle for players to perceive their character's spatial presence (Taylor 2002). In this thesis project, the first-person camera is used to simulate natural experience by inviting the audience to see through the character's eyes and from her perspective.

Building a Sense of Immersion

How does POV help to enhance the sense of immersion? The player's attention is one factor that needs to be considered. As Taylor suggests, when the player's attention is turned game-ward, it can compel the player to disregard real world existence and fade into the virtual world creation (Taylor 2002). Using first-person perspective, less effort is needed by the player to understand the interface than when the designer uses the third-person, birds-eye view, perspective (Kennedy 2012). The player sees what the character does; the visual image is transferred directly to the player and the player gives an immediate response to the virtual character. Without

seeing the character's body, which is not usually consistent with the player's aesthetic appearance, POV avoids the detachment that occurs in the third-person point-of-view scenario, where the character's figures are displayed to the player constantly (Taylor 2002). In most cases, game designers try to avoid showing a character's figure within POV perspective games, such as mirror reflections, the voice of the character, and views of the character's body. Game designers do not want players to be pulled out of the immersive gameplay by revealing physical evidence that indicates an inconsistency in appearance between themselves and their characters (Galloway 2006).

In the prototype for this thesis project, first-person POV camera avoids the display of the character's body for aesthetic and strategic purposes. As we worked to attach the audience to the character's vision, we were careful not to distance players from the character by reminding them of differences between them and their character.

Creating Engagement

In *A Grounded Investigation of Game Immersion*, Brown and Cairns (2004) analyze player's feelings toward their favourite games. As cited above, they posit three gradual and successive levels of player immersion: engagement, engrossment and immersion. While many games immerse players in the world, FPS games so effectively do so that it is worth delved further into their definitions. Engagement is the prerequisite level: "This is the lowest level of involvement with a game and must occur before any other level" (Brown and Cairns 2004). During the initial level of forming the immersive experience, the engagement phase must offer an immediate response to

players' action in games; the feedback of players' input must correspond in an appropriate and instant manner. The POV directly affects players' engagement with videogame form, starting them down the path to full immersion.

Engrossment is evidenced and fed by the increasing amount of time and effort a player invests. Brown and Cairns state, "The investment of time and effort makes people want to keep playing" (2004). At this stage, some gamers construct a distraction-free environment to get themselves involved more deeply into the gameplay, such as turning off lights in the room and wearing sound-blocking headphones. When players become engrossed, they focus very strongly on the gameplay and become decreasingly aware of their surroundings. "The game can affect the players' emotions as they can feel connected to the scenario and game characters" (Brown and Cairns 2004). Engrossed players suspend their disbelief in the game world. Being engrossed is a sign that a player is well on the way to experiencing total immersion, wherein outside reality fades away during gameplay in favor of the virtual world.

Visual Evidence

POV shots are often used in cinema to provide the audience with evidence necessary to support the films' narrative. For instance, the POV shot conveys visual facts to viewers such as showing them letters, notes, and telegrams. In *The Terminator* (1984), a POV shot of T-800 looking for a motorcycle allows the audience to obtain the knowledge that he is a highly advanced robot. *Robocop* (1987) employed this kind of

HUD display (figure 22) to present the robot's perspective. The robot's POV shot is often displayed with a crosshair and a highly sophisticated interface.

Figure 22 POV in *Robocop*, 20th Century Fox, 1987

Interestingly, in *The Terminator* (1984), James Cameron also showed the robotic eyes: red eyeballs with apertures, lens, and recording system. The presentation of the robotic eyes reveals evidence that the POV will be different from that of a real human. When the T-800 finally gets killed, his red eyes fade and die, mimicking the POV shot from the robotic perceptive, and echoing the red eyes' disappearance and fading to black.

One other variation that uses the POV camera to carry vital visual evidence is the HUD display helmet in *Iron man* (2008) (figure 23).

Figure 23 HUD display in *Iron Man*, Paramount Pictures, 2008

The POV shot in *Iron Man* is framed from the angle that points at the actor's face within the helmet. This version of the POV creates an intimate relationship between the audience and the character by settling them into a private space. This camera technique make a similar impact as the traditional HUD display while also conveying the character's expressions and reactions.

POV in Videogames

First Person Shooter games

As we have seen, the POV camera was initially invented by the film industry about 70 years prior to the release of the first first-person shooter (FPS) game. Today this camera technique flourishes in the game industry. FPS games deliver an intensive gaming experience via the first person POV. Within a realistic 3D-rendered game

environment, players are able to explore the game world through the eyes of their player-characters and experience the story by playing an active part in it. Harry Slater writes about the blurring line between videogames and movies, referring to games, such as the *Call of Duty* series, *Battlefield* series (figure 24), and *Medal of Honour* series, that have perfected FPS game experience by using cinematic storytelling. "Games like *Medal of Honour* began to break down boundaries between consoles and Hollywood." (Slater 2012). With powerful game console processing capacity, current FPS games are able to render photorealistic graphic and cinematic cut scenes. FPS gameplay now resembles action movies, with players acting as one or multiple roles in the "film." The core principle of FPS games, however, remains unaltered: creating immediacy through an emphasis on POV perspective, player decision-making and control over the character.

Figure 24 Video game *Battlefield 4,* EA, 2013

Myst (1993)

Comparing iconic POV shot films like *The Lady of the Lake* with an interactive game such as *Myst,* Bolter and Grusin write in *Remediation*:

> *Myst* is an interactive detective film in which the player is cast in the role of detective. It is also a film "shot" entirely in the first person, in itself a remediation of the Hollywood style, where first-person point-of-view is used only sparingly, except in special cases, such as *Strange Days* recently and some film noir in the 1940s…. Like many of the other role-playing games, *Myst* is in effect claiming that it can succeed where film noir failed: that it can constitute the player as an active participant in the visual scene. (Bolter and Grusin 2000)

Fifty years after *The Lady in The Lake* was made, the transmigration from one medium to another brings back the potential for the POV shots once seen in films. Alternatively, *Myst,* in essence, is a combination of serial pre-rendered images that allows players to interact with the fictional game world. Players are able to navigate through game scenes constructed by images (figure 25). Although all of the shots are pre-determined, the order of their display in the game is set by the player. This genre of computer games is sometimes called "interactive film" (Bolter Grusin 2000), where the player acts as character and director. In *Myst*, players advance the narrative by solving puzzles that give them access to further clues in the story and entrance to the next scene.

Figure 25 *Myst*, Cyan, 1993

Having discussed previous examples of including POV camera in films and videogames, it is possible to see that the POV camera became insignificant in the film industry because the film viewing experience is not controllable. Another reason is that cinema is often, if not primarily, viewed in a shared environment; audiences are unable to have individual input into the content. By contrast, videogames are designed to be interactive and the gaming experience is usually individual, allowing the player to engage actively in the gameplay. As Galloway said, "… if photographs are images, and films are moving images, then videogames are actions" (Galloway 2006). The goal of this thesis project is to transform the passive film viewing experience into an active engagement via integration of the interactive POV camera into the filming. The next problem to address is customization of the POV camera with interaction and how to make it beneficial to the audience.

5. Undertaking Active-Passive Embodiment

Innovation in Film Technologies for Immersion

There is no doubt that innovators in filmmaking have shifted their attention to capturing the overall spatial environment in a motion picture format and displaying them in such a way that enhances the immersive experience for audiences. Spatial filming usually tackles the formation of an immersive physical surrounding or environment that brings audiences into a virtually created world. Technologies such as Oculus Rift and 360-degree filming techniques have already made progress in this area.

360-Filming and *Bublcam*

The *Bublcam* is a technological invention that brings filming to another level. It is capable of capturing a spherical environment through panoramic photos and videos. A *Bublcam* has four wide lens cameras that are attached to a spherical body, providing a real-time video streaming from 360 degrees and giving audiences a captured world in which the user can explore (figure 26).

Figure 26 *Bublcam*, developed by Bubl Technology Inc.

The *Bublcam,* by Bubl Technology Inc., was invented in 2011 by Sean Ramsay, an immersive technology enthusiast and digital strategist. *Bublcam* software, which is the essential part of this innovation, allows video footage to be captured by four cameras on a sphere simultaneously. Users are able to switch camera angles within the sphere and look wherever they want. The footage captured by the *Bublcam* can be accessed and live streamed into the *Oculus Rift*. *Oculus Rift* is a virtual reality head-mounted display that offers a virtual reality experience. Aside from *Bublcam*, a Kickstarter funding campaign is underway for the project *The Giroptic*, which also offers multiple cameras filming by use of several *GoPro* cameras within a rigged system. These innovative technologies are now leading innovations in creating immersive spaces in both films and videogames.

Hardcore (An Action POV Feature Film)

While the game industry is a fertile environment for FPS games, film production companies remain conservative about making FPS films. Recently a team from Los Angeles decided to release their crowd-funding project described as “experiencing a Sci-Fi adventure film from the first person perspective” (Naishuller 2014). Their team is using a customized goggle rig, which has two *GoPro* cameras attached to a helmet for the actors, who actually shot the film. The filmmakers explain that they are “deviating from the standard shooting process” (from the *Hardcore* Kickstarter page). This experimentation in filming first person perspective offers a dynamic viewing experience, focusing the content on violence and adventure (figure 27). *Hardcore* demonstrates that the FPS aesthetic can survive and evolve in cinema. The first release of it has attracted over three million views on YouTube. The director Ilya Naishuller successfully raised $250,000 from Indiegogo for the production of full-length film as extension of the *Hardcore.* In my own viewing experience, I found *Hardcore* to be fairly engaging and intense.

Figure 27 *Hardcore*, Ilya Naishuller, 2014

IDNA

IDNA is a spatial interactive storytelling experiment presented by Apelab, a creative studio that, according to their website, focuses "on the future of interactive entertainment adapted to today's digital media and devices." Apelab released the first prototype of its interactive storytelling project, *IDNA*, in 2013. With *IDNA*, a spatial storytelling prototype for virtual reality and mobile devices, each scene in the story is designed for a 360 degrees viewing experience, enabling viewers to explore the space and storyline by directing the camera. Audiences can turn the device to navigate the virtual camera in the film (figure 28). In addition, the story presentation is fully interactive, giving the audience the ability to choose how it progresses.

Figure 28 *IDNA*, Apelab, 2013

In *IDNA*, the immersive experience is heightened as well by the background sound and film narration, which are 3D-positioned so that the volume and reverb of the sound is responsive to the camera's movement. The first prototype of this project was featured in the *New York Times* and *Wired US* as an innovative storytelling medium. *IDNA* sparked my interest in the potential of creating spatially interactive storytelling within conventional filmmaking with such innovative storytelling approaches. This was the inspiration for my thesis project.

6. Thesis Project FATED

My project is inspired by the potential in interactive spatial storytelling offered by using an interactive POV camera, within a traditional linear film narrative. With

augmented interactivity, viewers are able to control the POV camera during film viewing at certain periods of time. The active, controllable camera merges the POV camera technique and aspects of FPS videogame camera controls while maintaining a linear narrative. This offers the audience control of the rotation of the virtual POV camera, thereby allowing otherwise passive viewers to become part of the film through direct engagement. As I argue above, the inclusion of interactivity allows viewers to experience a closer relationship with the main character.

Overview

Project FATED offers both passive and active participation by using controllable POV camera shots in a directed narrative structure. The POV camera in the film builds up an intimate connection between the audience and the character. This method takes advantages of FPS's characteristics—as regards the immersive experience and character attachment—and integrates it into the storyline in order to enhance the sense of authenticity and to involve the audience actively in the narrative context.

My thesis project draws inspiration from the theories of immersion, POV camera, cut scenes, and narrative structure presented above. It attempts to bring these approaches together in the production of the FATED prototype: an interactive short film. FATED demonstrates the potential of integrating the interactive POV camera, as used in videogames, into conventional filmmaking. In essence, the blend of live-action and animation act as cut scenes in this 'gamified' film, stitching together the camera-

controllable and pre-directed parts. The study of videogame narrative structure also impacts the construction of the story, as well as the overall narrative progression.

FATED contains three components in one storyline: live-action, animation, and interaction. The live-action section, which is presented in the form of a scripted interview of a girl talking about her own story with a boy. The live-action part penetrates through the overall movie, connecting the animated memories and the interactive POV segments together. The live-action segment also introduces the story background and cues the animated pieces. The animation illustrates the memory and events that the actress talks about in the live-action. The interactive segment, a controllable POV camera, offers the audience the ability to navigate through constructed scenes and to witness what happens between the girl and the boy through whatever perspectives they choose.

The linear narrative structure offers viewers one story. Together, the audience experiences one plot and one structure; the only difference among viewers' experiences is the perspectives they take in the interactive parts of the movie. "Linear story structure is beneficial in narration because it ensures like experiences among players, streamlining themes, morals, and expected emotions experienced in game, as one might pick up from a story via text or cinema" (Shepard 2014). The FATED project emphasizes storytelling; it is more movie than videogame. Using linear narrative reinforces the shared nature of the audience's experience.

These three components—live action, animation and interaction—work collectively to advance the story. FATED is neither clearly identifiable as a film nor a

videogame; it is an attempt to carve out a screen-based entertainment niche between the two. Its varied aesthetic styles reflect those common to films and games: animation presents aesthetically like a videogame; the live-action feels familiar as a traditional cinema experience; and the active POV camera invites the viewer-turned-player into the virtual world, as do FPS games.

Design and Development Process

After completion of research into POV camera techniques, I began development of the prototype and experimentation with my project, in an effort to create a proof of concept, and conduct user testing of my hybrid filmmaking approach.

First and Second Prototype using the POV camera

In order to have a prototype to serve as a proof of concept on active POV camera shots, I started experimenting with a scene set in 3D software, with two virtual characters sitting in front of each other chatting about their lives. This was a rehearsal of an important scene in the final script. At the beginning of this experiment I set up two versions to evaluate the different uses of the POV camera. One version involved the attaching the camera to the protagonist's head without taking into account body momentum (figure 29). The camera excluded the rotation of the character's head; instead, the viewer controlled the camera's orientation. In the second prototype, the POV camera followed the rotation and position of the character's head.

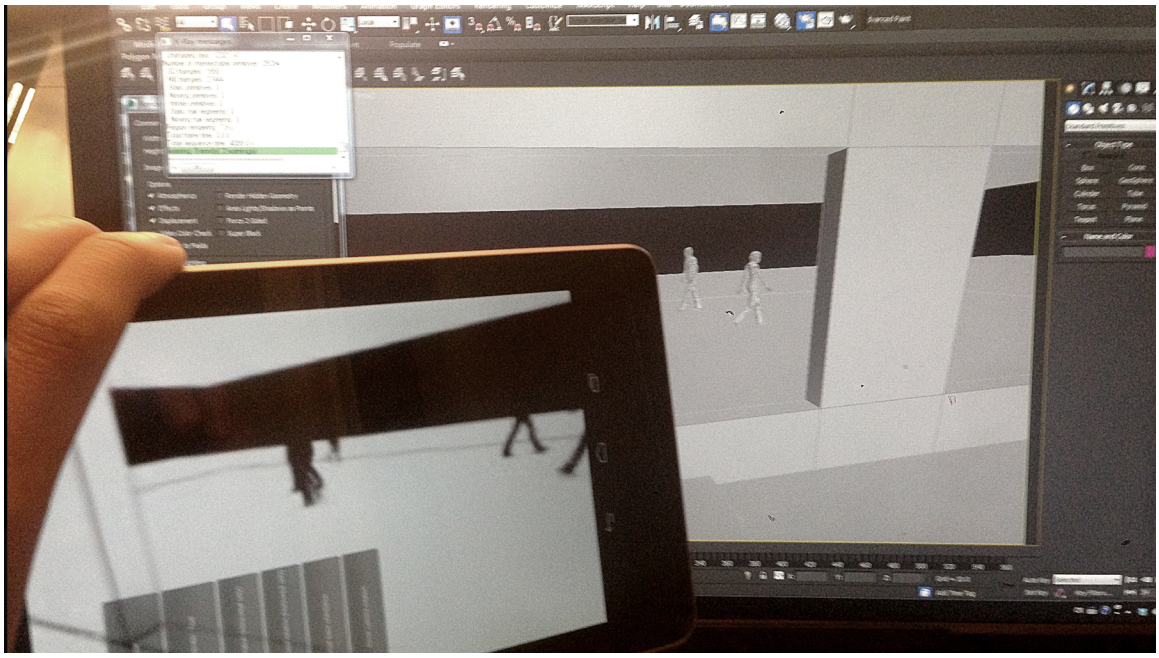

Figure 29 First Prototype

The test displayed a fifteen second, 3D-rendered, panoramic video sequence. It was rendered in 360 degrees (figure 30), which allowed the user to orbit the camera in the scene.

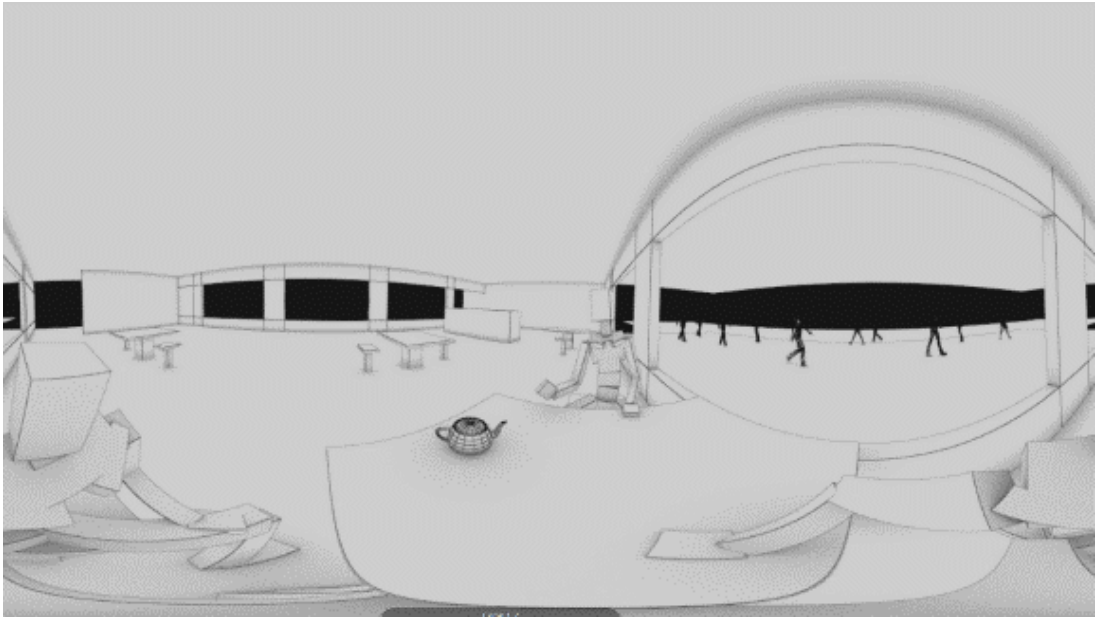

Figure 30 Raw rendering of video asset for first prototype

Unity videogame development software was used to construct the audience's interaction with the camera. *Unity* is effective and convenient for productions that need to be distributed to various platforms. The first prototype was performed on an Android Tablet *Nexus 7*. *Unity* took the data from the tablet's accelerometers and gyroscope and mapped them to the orientation of the virtual camera. Thus, when the viewer moved and rotated the tablet, the virtual camera reflected the change of direction accordingly. In doing so, the tablet screen acted as a window into the constructed world.

Initially, I conducted informal user testing with the first prototype and received informative feedback. I displayed this prototype to five participants individually; each viewed both versions of the POV camera footage. Three out of five participants stated that the camera in the second version was shaky, distracting and disorienting. Participants found they couldn't focus on the character because of the random and unsteady camera movements. They also reported that they had a hard time following the plot and didn't know where to look. In contrast, participants noted that the steady and still camera—the first version—delivered the information effectively and was much more compelling and attractive. They each stating that the viewing experience from the first camera was much more pleasant than the second: unsteady version.

First Prototype with the Addition of Narrative (Third Prototype)

The first and second prototype trials guided me in creating the POV camera shot styles and the footage arrangement. Following the initial user tests, I built a third prototype with further developments on the preferred, first prototype. The first

participants' unanimous preference for the steady POV camera was addressed in the third iteration.

In addition to the interactive camera portion, I included a live-action segment in the third prototype. The live-action section was a scripted interview of a girl who is talking about her daily life and personal background (figure 31).

Figure 31 Live-action from the second prototype

Figure 32 Animation from the third prototype

Figure 33 POV for the third prototype

The new prototype presented a two-minute video with the inclusion of interviews, animated memories and POV shots. My intention was to present a preview of the first part of the story. Although the graphics and rendering were not fine-tuned (as shown in figures 32 and 33), they played as a proof of concept for this prototype. The third prototype was distributed to two platforms: an android tablet and a laptop. The consideration for developing a laptop version was due to the dramatic video quality drop on the tablet platform.

The third prototype was shown at the Thesis Exposé, which was a presentation that included all thesis projects from the Digital Futures student cohort in the Master's program (figure 34). The larger pool of test participants resulted in much more diverse commentary. One criticism pointed out that there was a lack of instruction for the transition between the controllable and pre-directed sections within the prototype. Because the POV shots were seamlessly integrated with other components, without instructions, participants became confused by which part was interactive and which was not. The absence of instructions was due to a faulty assumption that the audience would have sufficient prior knowledge about using the camera control mechanism.

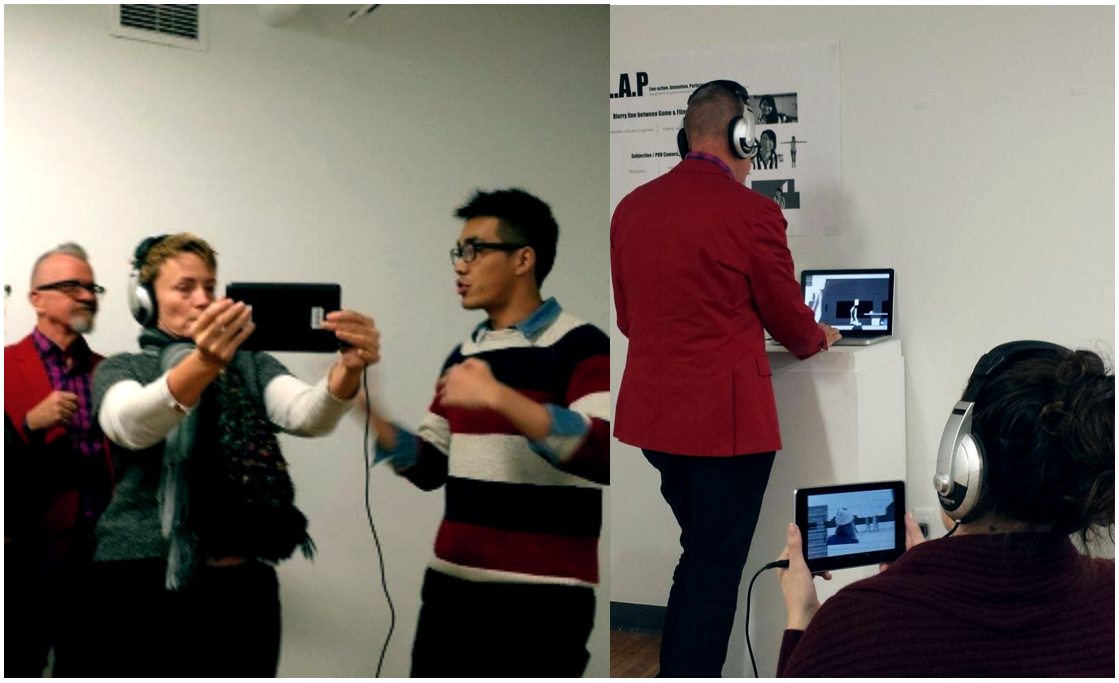

Figure 34 Prototype presentation at Thesis Expose

In addition, most members of the audience found the background music distracting. They reported that it took their attention away from the dialogue and did not advance or deepen the narrative well enough. The prototype used a vocal track rather than an instrumental one, and participants' experienced the singer's voice as overlapping with character conversations and causing them to become distracted and confused: for them, the narrative thread was lost.

My arrangement types of footage and between interactive or non-interactive elements were evaluated by the participants. The third prototype served as a template for further design of the narrative structure, aesthetic direction, music integration, and user experience. Synthesis of the participants' comments and critiques offered me guidance for the next stage of production: the fourth prototype iteration.

Fourth Prototype (Final Production)

The previous three rounds of prototyping and user testing made clear to me the direction and approaches that I would apply in the final production. The second prototype suggested that viewers did not prefer the POV camera that moved with the actress's body momentum due to the disorientation it caused them. As mentioned by Kennedy, the audience's immersion can be blocked by disagreement with the situation they are placed in (Kennedy 2012). The movement from the character's body in the second prototype was not responsive to the audience's actions and was disruptive of their full attachment to the character. Thus, the POV camera used in the fourth iteration was a steady and still camera through which viewers would be positioned at the center of the virtual world, visually, a perspective recommended by Bolter and Grusin for the successful creation of virtual presence (Bolter and Grusin 2000).

The animation previews during the third prototype introduced the primary set-up for camera framing and editorial pace. This informed production during the fourth prototype, influencing time management, the rendering only of clips crucial to the narrative, the instruction of essential assets, and the visual art direction of the animation. The script writing was finished by the end of the third prototype, so the user testing also helped me to hone the narrative structure before entering final production.

Story Development and Narrative Structure Process

With the insertion of an interactive camera in the structure of a conventional storyline, the narrative flow and construction needed to be customized to invite a

deeply immersive experience. Because FATED is more film than game, camera interactivity was limited to control of the camera angle. Viewers can look around freely within the created scenes but not affect the story or its structure. As spectators to the story, they are given their choice of perspectives, but not the power to change the course of events.

As seen in the section “Cinematic Crossover,” traditional screenwriting often breaks down the classical narrative structure into three acts: exposition, rising action and resolution. David Crabb, an American actor and writer, elaborates on the three-act structure in his talk, “Five beats of successful storytelling” (Godbout 2012). Crabb identifies a common pattern of five story “beats”, introduction, incident, stakes, event, and resolution. These beats fall within the three-act structure. An event is where a pivot or change occurs: for instance, the point when an incident happens, a plot climax, or the moment when the protagonist solves the dilemma (Godbout 2012). I integrate active POV camera shots most often during such events, as those are the “beats” during which the audiences’ virtual presence is most powerful and their sense of immediacy is most easily provoked.

Galloway writes that the POV camera supports the narrative: “The collection of visible evidence is often crucial in films, and the POV shot is commonly used to present to the audience evidence necessary to the film’s narrative” (Galloway 2006). The application of the interactive POV shots in this stage of presenting the essential events in the film benefited the narrative and affected the viewer’s experience.

During development of the story for the FATED project, I decided to write a romance that follows the hero's journey narrative structure with the inclusion of a POV camera. I chose romance based on my interest in developing an intimate relationship between the audience and the characters. My personal preference for the romance genre over, for instance, warfare, also factored into the decision. The 'love story' content was another experiment, since mainstream game use of POV camera was in FPS games, which are strongly associated with action and violent genres (note the term, First Person Shooter). I wanted to demonstrate that by using active POV in a love story, I could engender in the audience the sense of having a truly personal face-to-face interaction with the character. I hope that the audience would find themselves attached to the character by looking at the story through her perspective.

As noted above, the narrative starts with an interview with a girl, who talks about meeting a boy in a coffee shop one day. They later run into each other in a bookstore and have a memorable date. Because they lost contact with each other after that, the girl came to the interview to share her story with the media, hoping to find the boy. The plot is simple and straightforward, and the narration is told from the girl's first person perspective.

Animated Memories

In this project, the animation section was created to visualize the filmed character's memories. These animated clips are woven in with the live-action sequences. Photographic footage represents the present whilst animation depicts the past. The

animation is triggered by the actor's dialogue in the interview. The two different aesthetic styles of images intersect with each other, advancing the narrative.

Recently, there have been a rising number of documentaries that involve animation cut scenes. Directors sometimes choose to use animation to represent historical events and then insert these sequences with live-action footage. Projects such as *Another Day of Life* (2015), *Waltzing With Bashir* (2008), and *Operation Homecoming: Writing the Wartime Experience* (2007) are examples of films that depict history with the use of animation (figure 35).

Figure 35 Animated documentaries: *Another day of life* (Upper left), *Waltz with Bashir* (Bottom left), *Operation Homecoming* (Right)

Animation's role in documentary and fiction films shares some similarities. Animation, as an artificial creation, offers freedom of invention and self-expression. As filmmaker and animation teacher Maria Lorenzo Hernandez suggests, "Animation does have a high degree of self-reflexivity" (Lorenzo Hernandez 2007). One purpose of animation, according to Paul Ward, is "…to attract the attention to specific signifying practices of filmmaking, like the form, methods, or meaning" (Ward 2005). Animation

gives audiences a direct hint that they are viewing a constructed reality. Annabelle Honess Roe (2013), the author of *Animated Documentary,* also argues that animation can function evocatively. She claims that, animation serves "…as a tool to evoke the experiential in the form of ideas, feelings and sensibilities" (Roe 2013). This would allow audience members to share the imagination of the world from the director or character's POV. In FATED, animation gives the audience visual information regarding the oral description the character gives during the interview. It is used as a tool to spark the audience's imagination. Animated memories in the film are meant to reflect and build upon the audiences' assumptions in hearing the protagonist's story. I employed cut scenes to integrating animated sequences into the linear narrative.

Technological Analysis

Adapting controllable POV camera to my purpose was central to this project and where I invested most time and effort during production. Having decided that animation would be presented through cut scenes, I also researched available technologies to produce expressive character animations. Afterwards, I conducted research into 360 degree filming and current existing examples, such as *IDNA* and *Bulbcam*. Developing a realistic budget and accounting for accessible technologies led me to decide to simulate the POV footage through 3D animation. Technologies such as 3D scanning and motion capture are both techniques employed during post-production to create animated characters that would perform like real human characters.

3D Scanning

In order to keep the character's physical appearance consistent across different visual styles in the film, it was crucial to create digital characters that had the same facial features as the central actress and were easily recognizable by the audience as her character. Identifying the protagonist by her face was important for audiences to follow the narrative without feeling disconnected. I used 3D scanning technology to replicate the actors' faces digitally with a high level of detail. (The male character appears in animated form only.) Currently, there are several different solutions using particular technologies for 3D scanning on the market. With limited funds, I chose the low cost and efficient *Microsoft Kinect* depth camera. *Kinect* is a motion-sensing input device with infrared camera, able to capture depth data. Microsoft initially introduced it in November 2010 for its gaming consoles. With the developer kit, users can develop their own applications using *Kinect's* features for different purposes. With the capability of restoring depth data, *Kinect* is often used for scanning objects in the real world and making digital doubles in 3D software.

I used *Faceshift* 3D software for facial motion capture. *Faceshift* serves the gaming and visual effects industries, as well as to individual artists. "We're enabling emotional animation as an accessible storytelling tool and driving new forms of expressive communication" (*Faceshift* corporate website). As part of the facial motion capture pipeline, 3D scanning is a fundamental process that produces the digital character for further production. *Faceshift* provides decent scanning quality and generates digital characters that are easily recognizable.

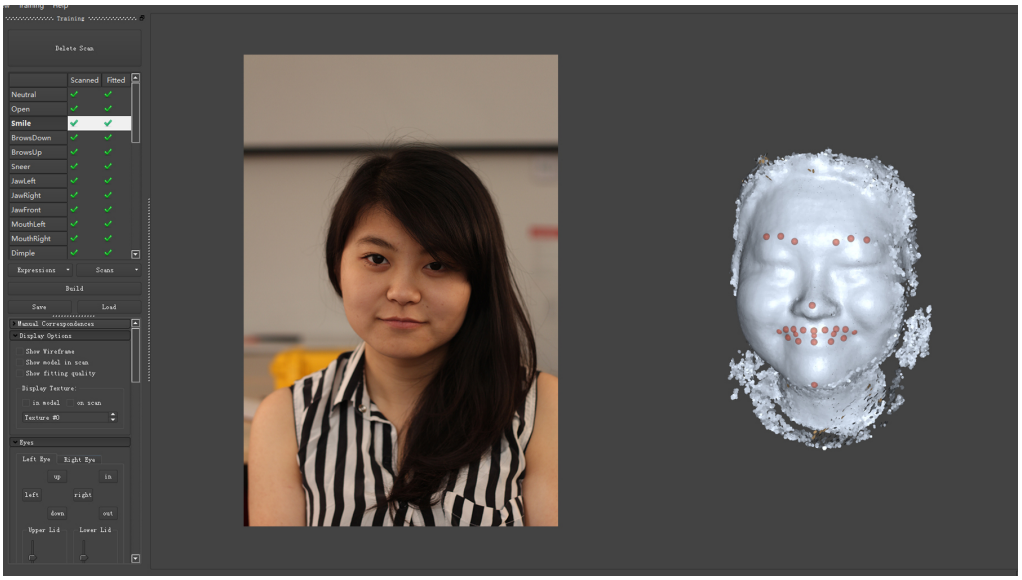

Figure 36 Actress 3D scan result

Motion Capture

Traditional character animation was a process that took long periods of time, using skilled artists to manually pose characters through observation. With the increasing demand for better character performance within in a shorter production timeframe, motion capture technology was introduced to the industry as a better solution for character animation. Motion capture is explained by Meredith, Maddock and Road:

> Motion capture devices allow the recording of live motions by tracking a number of key points in space over time, which are translated into a 3 dimensional digital representation. The captured subject can be anything that exists in the real world, with the key points positioned on the object such that they best represent the orientations of the moving part of the object, for example the joints or pivot points. In order to accurately triangulate maker positions, at least 4 cameras are used, however generally no more than 32 are used. (Meredith, Maddock and Road 2001)

Motion capture systems take real human performances and translate them into the movements and expressions of virtual characters. These systems reduce the time consumed on animation production and enable the director more access to the development of expressive animation. Although most motion capture systems rely on high budgets and professional teams, there are alternatives using much more budget friendly devices, such as depth cameras, video footage, and marker tracking systems. *Kinect* is able to use its infrared camera to track and scan an actor's face and produce high quality animations. In addition to the hardware, I used *Faceshift* in creating the virtual character's performance. During the production of the animation, actors were asked to act out the scripted dialogues in front of a *Kinect* camera, which captured their actions and facial expressions and mapped the data to the virtual characters' faces (figure 37). The digitally created characters were able to express emotions as real human expressions. In addition, each actor has a unique pattern of behaviour, which would help the audience to identify the character.

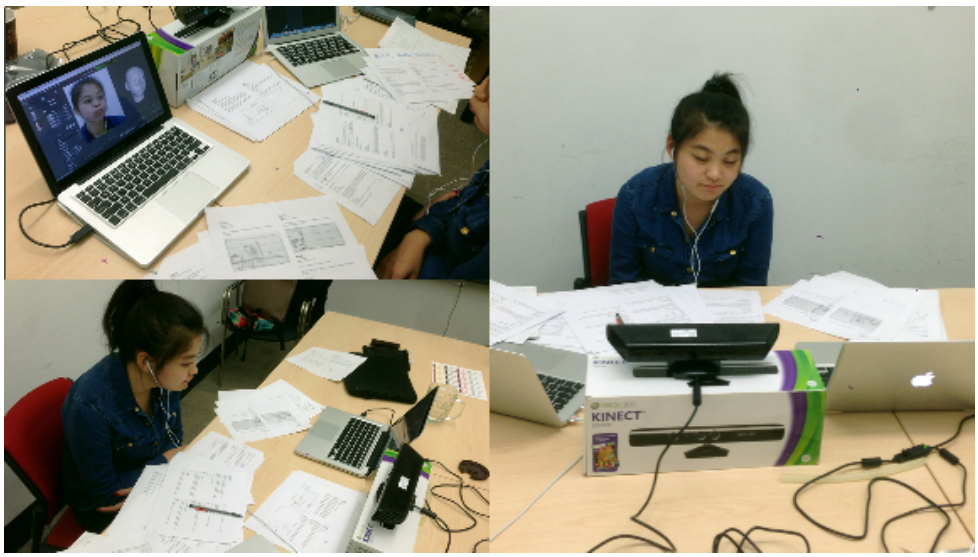

Figure 37 Facial Motion Capture for actress.

Development and Production

The script for this film was finished at the end of December 2014. Development of the fourth prototype started in January 2015. I recruited the leading actor and actress for this film once the research on the technologies and experiments were finished. Two of my friends became candidates for the leading role. I held two rounds of auditions (figure 38) and selected Jetty Zhang for the part, as I felt that she delivered the most authentic and desirable performance.

Figure 38 Auditions

Once the actress was on board, I scanned her face digitally using *Faceshift*. The actor was asked to perform a series of different facial expressions to get captured by the

Kinect sensor. *Faceshift* generated a 3D head model that with all the actress's facial features. Afterwards, I took a series of pictures for reference in designing the garments, haircut, and makeup (figures 39, 40 and 41).

Figure 39 Actress's scanning data

Figure 40 References for costume design.

Figure 41 References for haircut and makeup design.

The vantage point in this film is that of the female character; the male character plays the supporting role. I decided only to videotape the actress in real life, and only to

digitally produce the male character. After successfully recruiting the Jetty Zhang, I ran into a problem with hiring an actor; none of the volunteers I contacted were appropriate for this role. I eventually assumed the male character's role and undertook the voice and motion capture myself. The male's digital figure was modified and retouched using a 3D scan of my face.

Live-action filming was completed in February 2015. The actress was asked to read and perform the script for the interview. After filming the interview, I filmed extra reference footage for the animation production. The footage included the main character's walking cycle as well as her hand gestures while talking and other behaviours that could help the audience to identify with her character. With this footage, I created a digital double of my leading actress character (figure 42).

Figure 42 Actress's digital double and human reference

Then I went location scouting for a coffee shop and bookstore reference. In the script, these two venues were the settings for most of the two characters' interactions. Pictures of the interior and exterior of bookstores and coffee shops were taken during the location scouting. The two locations in the final prototype were designed after the inspiration from the real stores that I visited (figure 43).

Figure 43 Location reference pictures

Animation plays an important role in this film, bleeding into the segments where the active POV camera is used. The art direction of the animation, which distinguished the graphic and aesthetic style from the live-action segment, was inspired by two animations: *One Day* (2012) and *Another day of life* (2012) (figure 44).

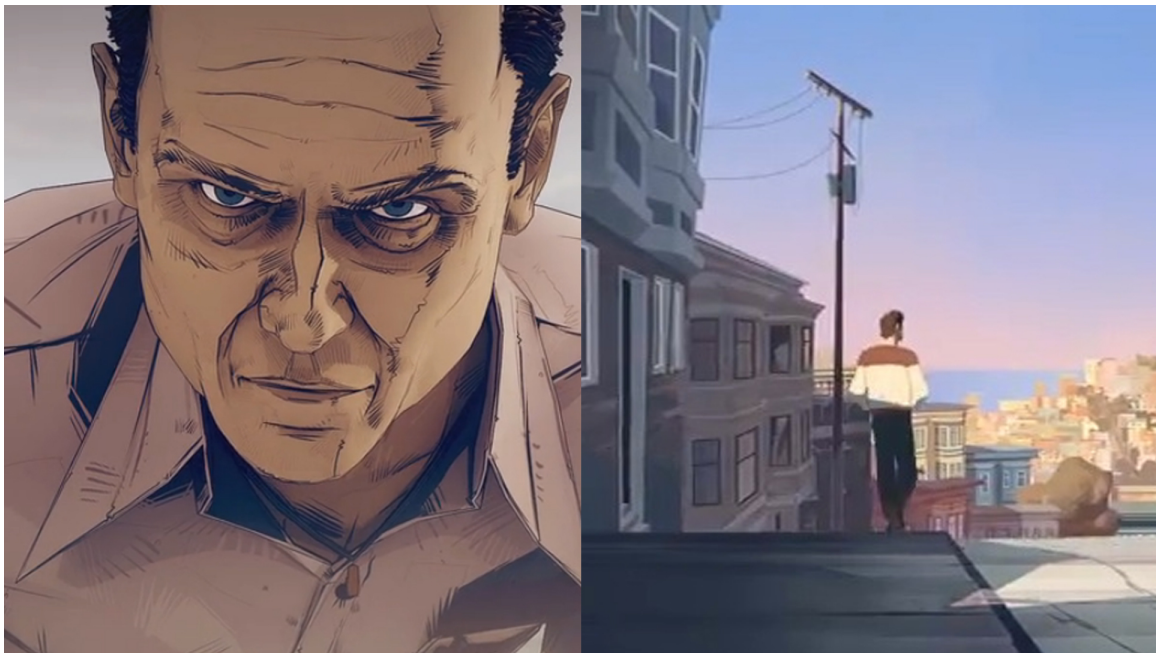

Figure 44 Art direction references from *Another day of life* (Left) and *One Day* (right).

The way the stylized 2D graphics in *Another Day of Life* and *One Day* were rendered in 3D software appealed to me. The character animation was made in 3D software with the motion capture system; therefore the character's movements were very fluid. Rendering in a 2D style maintained the sketchy "cartoony" feeling I was after. I used *Autodesk 3ds Max* as the primary software for animation creation and *Adobe After Effects* for compositing and post-production (figures 45 and 46).

Figure 45 Animation compositing process in FATED

Figure 46 Animation shots from the final prototype.

The creation process for the POV shots was similar to the animation production pipeline. With the freedom of construction in the virtual world, the camera was easily

manipulated to adjust to the character's performance and took less effort and time than it would have in live-action. The interactive POV needed a fully rendered environment, requiring every detail to be visible, and *3ds Max* offered a panoramic rendering feature that rendered the image with a 360 degree view horizontally and 180 degrees vertically, covering the entire environment around the camera (figure 47).

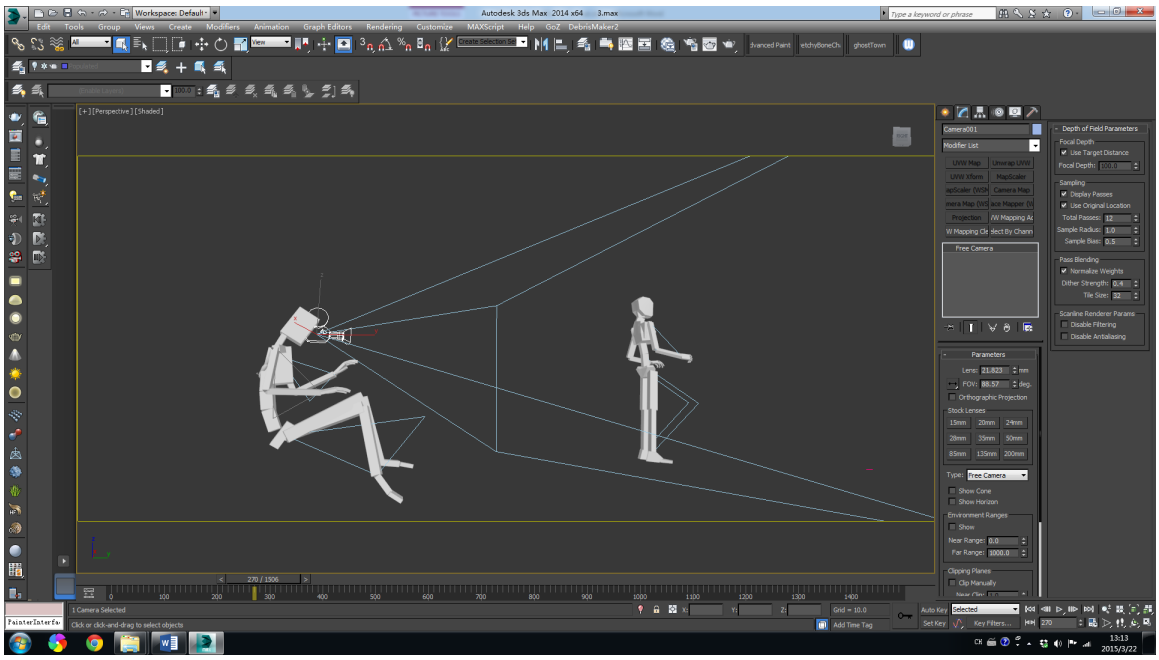

Figure 47 Camera set for POV shots in 3dsmax

The final prototype was compiled using the game engine Unity. Its purpose was to allow users to interact with the virtual camera via the input device. Taking the pre-rendered panoramic footage exported from *3ds Max*, I mapped the footage on a sphere created in Unity, which contained a virtual camera located in the center of the sphere (figure 46). At any given time, the camera only inspected a framed window with a 16:9 ratio. Thus, when the user navigated the camera and changed its orientation, the

camera would change around the panoramic footage accordingly. The illusion that the player changed the camera frame was thus created (figure 48, 49).

Figure 48 Camera setup in Unity

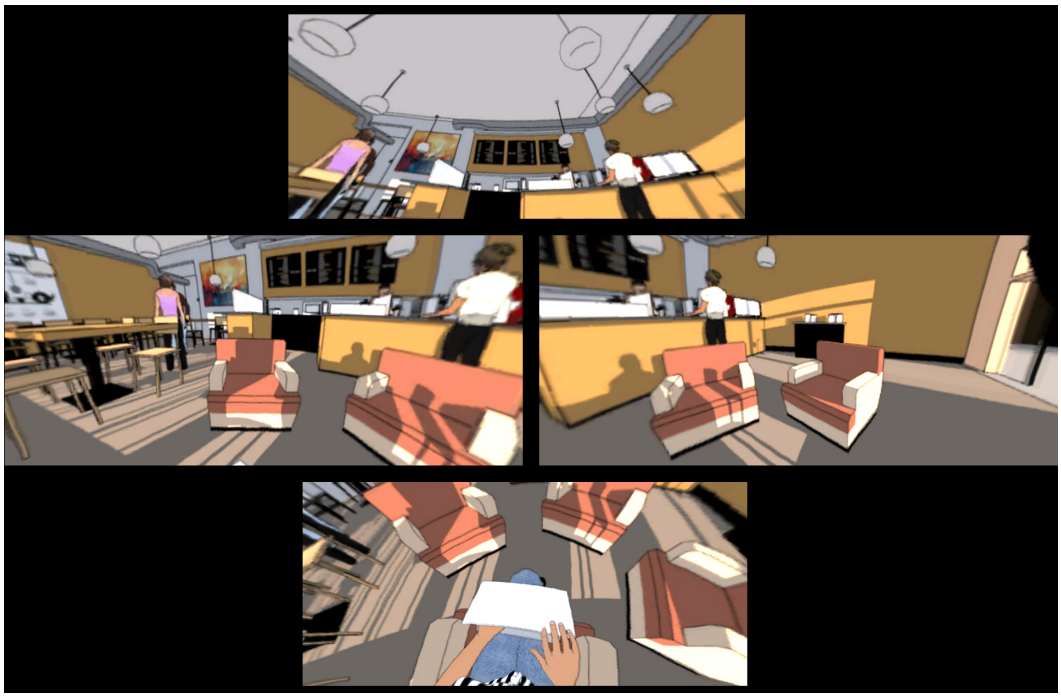

Figure 49 POV result

These three components—live-action interview, animated memories, and POV interaction—were edited together seamlessly. The transitions among them are smooth and well-integrated. The filmed interview with the actress start the story and introduce the narrative background. The storyline progresses to the animated memories, which are cued by the dialogue in the interview. The Interactive POV blends in with the animation, as audiences are allowed to navigate and explore the scene. These three sections closely follow, and thus enhance, the narrative structure.

Sound Design

Sound plays another significant role in the process of delivering an immersive experience. Sound effects, dialogue and background music acoustically support the visual experience. Sander Huiberts investigates audio's potential for supporting an immersive gaming experience: "Multiple speakers that are placed around the player, surround headphones or other devices that emulate three-dimensional sound are useful for suggesting that the game world is more encompassing than what is displayed on the screen" (Huiberts 2010). In order to simulate three-dimensional sound, and to enhance the immersion in the viewing experience, all of the sound sources, such as conversation and sound effects, need to be placed so that they seem to respond to the viewer's orientation. The changes players make to the camera orientation and position would thus affect the volume and position of the sound. According to Huiberts, this difference in orientation of sound suggests that "the world in the film is larger than what is seen on

the screen" (Huiberts 2010). The fourth prototype uses spatial sounds to help engender a feeling of presence in the virtual world of the film.

In the sound production of this project, I was fortunate to use two original songs with instrumental versions, *Mr. Lovable I & Mr. Lovable II*, by my friends, Ruiqi Liu, an indie musician, and Shaobo Zhang, her producer in China. These two songs matched the film's atmosphere very well. Also, the lyrics perfectly expressed the different mental states of the female character.

User Testing

Production for the final prototype continued for three months. Once it was finished, I advanced the prototype to user testing with six participants, to collect feedback and video data for future analysis and iteration. The user testing was approved by OCAD's University Research Ethics Board (see Appendix A). This study was allowed to conduct user testing with participants outside the Digital Futures program. Participant selection was gender, age and ethnicity unbiased.

Six participants were recruited, three men and three women, ages 20-35. The official user testing was conducted on March 7th, 2015. Participants were recruited randomly without any criteria. The user testing was broken down into two sections: 1) demonstration of the prototype and 2) interview with questionnaire. Participants were videotaped for their reactions during the demonstration and engagement with the prototype. The video transcript was used to analyze how selected audiences react to the prototype physically and emotionally. Alongside the demonstration, each participant

completed a questionnaire with 12 questions (see Appendix B) regarding their experience of the prototype. The questionnaire assesses the design of the film from various aspects: the narrative structure and flow, the efficient use of the POV camera, the quality of animated memories, and the level of immersion of the overall experience.

The prototype was demonstrated on an Android phone with a *Google Cardboard* goggle. The *Google Cardboard* is a head-mount foldout cardboard that combines two lenses. It aims to provide Virtual Reality experience with low-cost equipment (figure 50, 51)

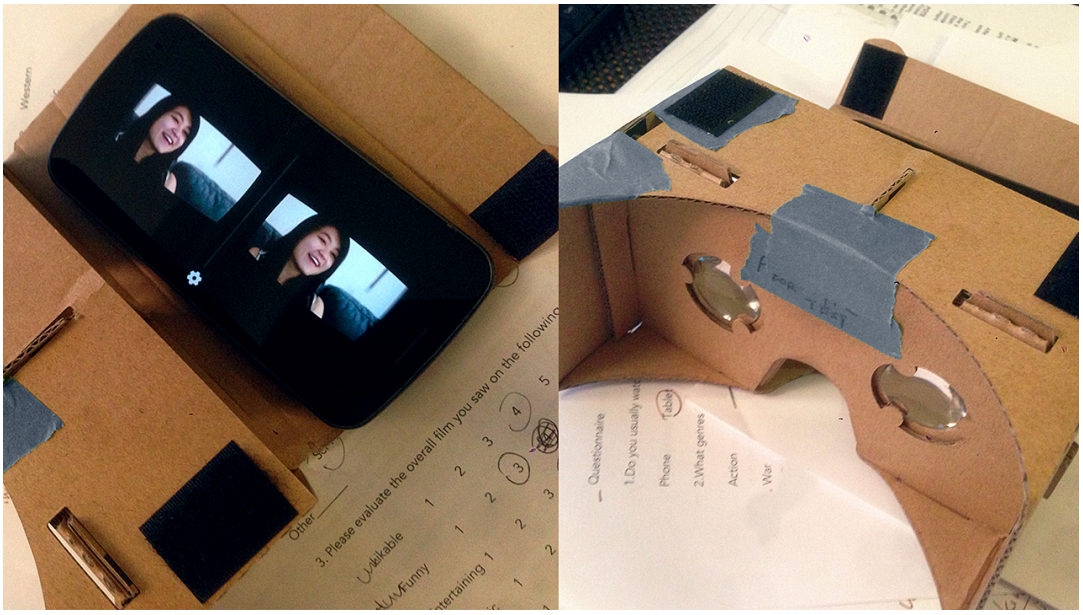

Figure 50 Prototype with *Google Cardboard* for user testing

Figure 51 Prototype with Google Cardboard for user testing

By using Cardboard, I aimed to offer a personal and private viewing experience. The viewer was able to see only the screen in the Cardboard. Light from outside was blocked by the goggle, forming a darkened, cinema-like environment. Moreover, *Google Cardboard* is fully mobile, with no cables attached, so audience members were able to move freely with the device. The built-in gyroscope from the smartphone took the audience's head movements and reflected them onto the orientation of the virtual camera in FATED. *Google Cardboard* will also be used in the final exhibition of the thesis project. This mobile viewing platform may be the choice during distribution of this film.

Report and Analysis

The results from the testing were informative. All participants reported on the questionnaire's 'likely' scales that the viewing experience with FATED was interesting and entertaining. Four participants indicated that they never experienced a film

resembling FATED. The overall experience was exciting and compelling. Three participants were clear that the controllable POV camera was presented from the actress's perspective while three believed the POV camera shots to be from a spectator's (e.g. a third person's) point of view in the movie. Five viewers were confused about which part the camera was controllable and which part was not. They pointed out that the confusion was due to a lack of explicit indications of the transition from the pre-directed components to the interactive sections. The participants reported that the coffee shop was the most memorable scene for them in the movie, since it was where they were first introduced to the controllable camera.

One important note from the questionnaire responses is that four participants noted that the controllable POV camera allowed them to discover more elements in the scene sets. In the coffee shop section, they only found the actor who walked by the actress by moving the camera around. In addition, they also found two people who were not mentioned by the dialogue in the scene. The two extras were placed to populate the store appropriately, and had no further connection to the story. Furthermore, two viewers stated that, since they were clear that the POV section was from the actress's perspective, they felt immersed in the scene by playing her. One added, "By playing as the character, I feel myself to be in the coffee shop and I can see the laptop in front of me as well as the boy who walked by." The other's comment communicated the same perceptions.

Another very interesting result from the testing is that all of the three participants who successfully recognized that the POV camera was taken from the

actress's point-of-view were female. The three male viewers assumed the POV was from the third person's perspective. My guess is that because the POV camera is presented from the actress's perspective, audiences were able to see the body features of the girl, which made it easier for female audience to identify themselves as the character. In contrast, male audiences might feel detached from the character due to the lack of coherence in the physical appearance features with the female character. This issue was not investigated by this research and has potential as a future direction to exploring regarding character identification for audiences.

Participants also offered suggestions regarding the platform for presenting this film. Four of them wanted to see this project displayed on a big screen, or a CAVE system. A CAVE system is a virtual reality environment where projectors are directed to four walls of a room-sized cube (figure 52). Two viewers preferred the *Google Cardboard* because it afforded them a private and personal experience. As the prototype was displayed for testing on an Android phone with a low-resolution screen, all participants pointed out that a higher resolution screen would improve the viewing experience.

Figure 52 The w:Cave Automatic Virtual Environment at EVL, University of Illinois at Chicago.

The participants made several suggestions and additional comments. They mentioned that they would like to have more interactions and freedom to explore the scene beyond control of the camera during the movie. For example, they would enjoy being able to have the character walk around the scene and interact with objects, or having the choice to play as a third person spectator in the movie instead of as the protagonist. Some viewers also wanted to see different genres of films involving this interactive POV method. Those suggestions inform future iterations of this project, which will focus on exploring the use of interactive POV in different genres of films and offering more interactions during the film viewing.

Reflections and Questions

FATED project is considered as an experiment in creating an immersive film viewing experience by bringing interactions to cinema. It attempts to immerse participants into the story and build a closer connection between the viewer and the character by allowing them to take control of the camera temporarily. Due to the time constrains this thesis was only able to explore one aspect of this phenomena, while FATED also opened up other questions in the discipline of immersive content creation. At the current stage of development, FATED only offered audiences the freedom to look around the scene. Thus the viewing experience thus could not be considered as fully interactive one. The audience-controllable camera in FATED expanded the audience's vision from a framed window to the entire spatial surroundings. Unlike in videogames, viewers in FATED were unable to interact with objects or characters in the film. The user testing suggested that instead of being an interactive experience, that FATED did deliver an immersive viewing experience. Audiences felt closer to the character, and viewers felt they were in the movie scenes. FATED took an experimentation approach and at the current stage of development and this innovation presented the potential of producing an immersive experience. It also opened up the possibilities for collaboration between videogames and films.

The final FATED prototype was distributed to three distinctive platforms: mobile phone, tablet, and PC. The viewing experience on each platform was customized based on the devices' specifications. In the user testing, a smartphone was used to fit into a head-mount goggle, delivered a deeply personal and private viewing experience.

Meanwhile, the viewer's head movement was reflected in real-time to the perspective changes inside the movie. The experience on the smartphone platform is the most immersive and exclusive but the goggle disenabled the options of sharing this experience with others. Tablets fitted in the gap between the phone and the PC platforms. It came with a bigger screen and the user interaction was more intuitive than the mouse control from the desktop. FATED on the tablet was a more shared experience, unlike in the head-mount display, the tablet allowed audiences to watch the film with others while the control machismos maintained the same as the smartphone. The PC platform otherwise, was designed for distribution and accessibility of this project. The control method was optimized that the mouse controlled the camera movement. FATED would eventually be distributed online and to make it more accessible, a PC version was produced using the Unity Web Player, which could play FATED in a browser window and audiences were able to watch it online. Although the immersive experience of moving the device to control the camera was compromised, the PC version enabled this immersive experience to audiences who without mobile devices.

Other questions were raised during this study and some of them could be taken as future directions. One was the balance between interaction and directed content. The freedom given to the audience to look around might come with the problem that viewers would miss important plots, or they didn't really look at where the story happened. Another problem that I found was which platform would be the best one for this immersive experience. How this content could be migrated to the cinema environment with a group audience? Should this experience remain personal or could

be a social one? When the technology is getting more accessible, what are the potentials of the collaboration of videogames and films? Those questions presented the future directions for this thesis and I will elaborate them in the next chapter.

7. Conclusion

This thesis was an attempt to innovate aspects of the interactive filmmaking process. By combining filmmaking techniques and use of controllable cameras from videogames, I produced an interactive film that includes attributes from both of the two media. This study began by researching immersion in videogames and film to explore their attributes, a step necessary for me to approach the question of immersion in my project. I concluded that a virtually created environment that allows the viewer to be surrounded by a coherent narrative space and time, along with audience empathy for the character and story, are needed to form a truly immersive experience and character identification. The research continued with a discussion about how videogames became a powerful storytelling tool, combining gameplay and the cinematic narrative techniques, specifically via the use of cut scenes. Afterwards, research into narrative structure indicated the placement of cut scenes and how it could be beneficial to the overall gaming experience. During the analysis of the crossover between films and videogames, I found that the POV camera is an effective entry point to bring interaction into the cinema, since the POV exists in both media, albeit emphasized differently. Thus, I concluded that interactive POV could be a bridge between film and videogames.

This project employed several strategies and approaches inspired by existing research and experiments. I looked to Murray's theories that originally defined immersive experience as: "the feeling of a subject surrounded by other mediums" (Murray 1998). This notion was reinforced by Taylor, who concluded that diegetic immersion occurs when "…the reader and player become lost in the content and become unaware of the physical world" (Taylor 2002). Keen's work then added to my study of immersion through identification with characters, stating: "…character identification and audience empathy is what invokes the immersion on a diegetic level" (Keen 2006). The active POV camera satisfied the requirement for audiences' immersion in a narrative, as shown by FPS game form. The linear narrative structure also keeps audiences focusing on the story without being overly distracted.

The three genres engaged in this film serve the story in unique ways. Animated memories triggered by live-action dialogue delivered a visualization of the live-action conversations. Moreover, they served to advance and deepen the story by weaving together the live-action interview clips. The final prototype revealed that giving the viewer freedom of camera control within the narrative enhanced their viewing experience and allowed some of them to feel engaged and represented in the film.

For this project, the genre I chose was romance. It was based on personal preference and my interest in building a bond forged of affection between the audience and the main character. Future iterations of this project will use a diverse range of narrative genres to accommodate different audiences' preferences.

This study focused on the POV camera and its implementation in a linear narrative. According to the results from my user testing, wherein six participants engaged with the prototype of this project, I found that allowing audience members to direct the camera throughout parts of the story did indeed augment their viewing experience, as found in the result, from the questionnaires, that four participants reported that the hybrid viewing/controlling experience was something new, interesting and compelling for them. Two of them reported that the POV camera portion was immersive and that they felt they were in the scene during it. Four participants stated that the interaction enabled them finding more elements in the scene. In addition, results from the user testing revealed that users who had basic knowledge about FPS game mechanisms, or had previously played FPS games, desired more opportunities and ways to interaction in the scene. Activities such as exploring the spatial environment freely, having interactions with objects or characters in the scene, and being able to affect the narrative path were the three most preferred additions. The multiple branch narrative could be considered as one direction. Depending on where the audience looked the plot could seamlessly change into another paths.

The final prototype indeed supported some of my assertions from the beginning of this study. The integration of the controllable POV camera engaged my audience more actively than purely passive viewing would have. It demonstrated that, indeed, the interactive POV camera could be made to work dynamically within cinema. My view that a hybrid of videogames and films can produce a higher level of audience engagement during viewing was reinforced. User testing also revealed that viewers were excited

about this new experience and delighted to be able to see extra content from beyond the directed frame. As we can see from examples given earlier of crossovers between videogames and films, the videogame and the filmmaking industries are absolutely moving closer, with the boundary between the two media beginning to blur. Reviewing evidence of the rising number of innovations and experiments in the field of immersive technology and 360 degree filming, I conclude that improving the passive film viewing experience is getting, and will continue to get even more significant attention.

While conducting the research for this thesis project, I learned of a number of emergent technologies dedicated to the delivery of an immersive gaming and film viewing experience. It is beyond the scope of this thesis to include all related existing technologies and related projects in this paper, and consequently I selected for inclusion only the ones that best represent and support the direction I took with this project. In continuing this study, I would explore relationships among different film and gaming approaches and genres to achieve greater audience engagement and audience immersion. Although this thesis covered only one narrative genre and could not conclude a universal rule for immersive filmmaking, the prototype reveals that a romance narrative with controllable POV camera brought audiences and characters closer, as well as supplemented the audience's viewing experience in new ways.

With this study, I crafted a novel method of including an audience-controlled POV camera within a linear narrative with animated and live-action sequences. This experiment was meant to produce a hybrid, semi-interactive format of entertainment experience that blends approaches from films and videogames to deliver the audience a

more engaging experience. This method of mixing film and videogame formats holds significant possibilities for further development.

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9. Appendix

Appendix A: Questionnaire for the User Testing

Questionnaire for L.A.I viewing experience

Presenting the short film (DEMO)

Questionnaire

1.Do you usually watch movies on mobile platform (phone, tablet)?

Phone Tablet

2.What genres (types) of film do you like to watch?

Action Horror Crime Comedy Romance Western

War Sci-Fi Dance Adventure Drama Epic

Other_____

3. Please evaluate the overall film you saw on the following scales:

Likable	1	2	3	4	5	Unlikable
Funny	1	2	3	4	5	Not Funny
Entertaining	1	2	3	4	5	Unentertaining
Dramatic	1	2	3	4	5	Not Dramatic
Compelling	1	2	3	4	5	Not Compelling

4. What is the most memorable scene for you in this film?

5. What did you discover from this controllable POV camera experience?

6. On a scale from 1-10 (10 being highest), how would you rate this short film?

1 2 3 4 5 6 7 8 9 10

7. Did you find any confusion in viewing this film?

Yes No

If yes, please specify

8. Did you feel that the POV camera created a greater connection between you and the characters? Which character did you feel more relate to?

9. Would you like to view this film on a big screen in theater?

Yes No

10. Were you distracted from the plot by any portion is this film by the interaction?

Yes No

If yes, please specify

11. What interactions besides controllable navigation you think should be given in this film?

12. What's your suggestions regarding the future iterations of this project?