

ON THE FUTURE OF
INTERACTIVE AND IMMERSIVE
360° LIVE ACTION FOOTAGE
AND THE FUSION OF THE FILM
AND THE VIDEO GAME



By Tom Block

ABSTRACT:

The following dissertation looks at the future of interactive film in the context of an increasingly participatory contemporary culture, dominated by the simulation and the video game. Recent trends and developments regarding video recording technology will be examined and particular focus will be placed on the launch of 360-degree cameras; cameras that allow the capture of interactive and immersive fully spherical live action footage. To complement this, an analysis of two opposing strands of narrative theory surrounding the concept of interactivity in films will be provided. These two strands of thought will then be compared with similar theoretical inclinations within video games theory. Ultimately, a conclusion will be drawn regarding the future of films, video games and a new narrative art form that could potentially result from the fusion of these two media.

TABLE OF CONTENTS:

I.	Introduction: Participatory culture and the quest for interactivity and immersion in the creative and cultural industries.	1
II.	The electronic POV shot, 360-degree filmmaking and other relevant trends and developments in the film and video game industry.	9
III.	Interaction-compatible models of narrative in new media, film and video game theory.	20
IV.	Conclusion: The future of interactive and immersive 360-degree live action footage and the fusion of the film and the video game.	30
V.	Bibliography.	37



PARTICIPATORY CULTURE AND THE QUEST FOR INTERACTIVITY AND IMMERSION IN THE CREATIVE AND CULTURAL INDUSTRIES

Our cultural life and consumption of media is of an increasingly more participatory character. If large crowds of young people queued outside of movie theatres in the 1950s, eagerly awaiting the latest movie premiere, today large crowds of young internet users spend their evenings uploading YouTube videos and 9Gag posts. They spend most of their leisure time updating their blogs, social networking profiles and personal websites, which they use to publicly express their experiences and opinions, to showcase their own works or their variations on other people's works. An interactive audience, demanding a role of participation instead of spectatorship, has replaced the traditional audience that passively consumed the popular entertainment of the 20th century. The popularity of open world online multiplayer games or MMORPG's, blogs and microblogs, social media and other Web 2.0 environments designed for the social sharing of homemade content are all indicators for this new consumer demand. Cultural production is now no longer an activity carried out only by a few for the many; it involves everyone who has time on their hands and access to a computer or a mobile device. Whether under their real name or in the form of an anonymous virtual alter ego, the average person finds him or herself in the middle of a shift from being the sheer consumer of cultural goods to being an active part in the production chain. Many mass-media entertainment goods in the modern day target exactly this new producer-consumer relationship; a relationship in which the consumer is at all times actively engaged. This has resulted in a shift of interest and attention from traditional forms of enterprise-led cultural production to new forms of user-led cultural production. One popular example of this is the 'Internet Meme', defined by Davison as "*a piece of*

culture, typically a joke, which gains influence through online transmission.”¹

Often memes consist of recognisable screenshots taken from popular media with an added joke in textual form. However, familiarity with the movie, game or TV show on which the meme is based is rarely required in order to understand the joke, turning the meme into a standalone cultural good in itself. However, internet memes are only one of many phenomena in which user-generated content based on the user’s consumption of popular media develops into another new independent form of popular media. The posting of personal gameplay footage online, accompanied by often-humorous commentary, is yet another example in which consumption and production turn into one single process. This practice, which constitutes a whole genre of YouTube videos, is known as ‘Let’s Play’, also abbreviated as ‘LP’.² Due to the open world multiplayer structure of some video games, these videos sometimes even include content unrelated to the original gameplay and contain completely user-generated narratives. For example, in a YouTube video from the LP team Achievement Hunter, the video game *GTA V* is used mainly as a platform to simulate a virtual race to the top of a hill between the different multiplayers.³ On another occasion, again using *GTA V*, the team attempts to stop a train by placing their vehicles in front of a tunnel, recording the subsequent explosion from the player’s different angles.⁴ In all of these videos, the Let’s Players are commenting on each other’s skills and communicating with each other during live gameplay in a comedic way, making the experience of watching entertaining in its own right. LP should however not

¹ Davison, P. (2012) “The Language of Internet Memes” In: Mandiberg, M. (Ed.) (2012) *The Social Media Reader*. New York, NY: New York University Press. pp. 120-134

² Hale, T. (2013) *From Jackasses to Superstars: A Case for the study of ‘Let’s Play’*. Available online at: <https://www.academia.edu/5260639/> [Accessed: 14th August 2014].

³ Rooster Teeth YouTube Channel (2013) *Things To Do in GTAV - Race To The Top* (Online Video). Available online at: <https://www.youtube.com/watch?v=GvCDWRpFbQ0> [Accessed: 14th August 2014].

⁴ Rooster Teeth YouTube Channel (2013) *Things To Do in GTAV – Stop that Train!* (Online Video). Available online at: <https://www.youtube.com/watch?v=eJWWOC67m9E> [Accessed: 14th August 2014].

be underestimated as a simple hobby or pastime because for many passionate video game enthusiasts, Let's Playing has already taken the shape of an extremely financially rewarding profession. The Let's Player Pewdiepie, for example, is with his nearly 30 million subscribers and a total of 5 billion video views, YouTube's highest earning partner of all time.⁵

All of these are examples of cultural production in the age of the 'prosumer'; a term coined by Alvin Toffler in the 1980 book *The Third Wave*. The 'prosumer' is a hybrid between the 'producer' and 'consumer'.⁶ Other terms to refer to and expand upon this new phenomenon also include 'Pro-Am' as used by Charles Leadbeater and Paul Miller in *The Pro-Am Revolution*,⁷ or the term 'produser' as coined by Axel Bruns in the essay *Prodsusage: Towards a Broader Framework for User-Led Content Creation*.⁸ In his subsequent book *Blogs, Wikipedia, Second Life and Beyond: From Production to Prodsusage*, Bruns explains the term 'prodsusage' as a direct user-led contrast to the traditional enterprise-led industrial model of content production and the 'produser' as any participant or contributor towards it.⁹ Whatever term one may ultimately use to refer to this phenomenon, it is exactly this rise of prodsusage, the shift from spectator to participant and the mergence of the amateur and the professional that is challenging and changing established creative and cultural industries and the traditional relationship between producers and consumers in the modern age. The new relationship,

⁵ Wadson, D. (2013) *Gamertube: Pewdiepie and the YouTube Commentary Revolution: How a new wave of YouTube stars is blurring the line between creator and fan*. Available online at:

<http://www.polygon.com/features/2013/9/6/4641320/pewdiepie-youtube-commentary> [Accessed: 14th August 2014].

⁶ Toffler, Alvin. (1980) *The Third Wave: The Classic Study of Tomorrow*. New York, NY: Bantam. p. 275

⁷ Leadbeater, C.; Miller, P. (2004) *The Pro-Am Revolution: How enthusiasts are changing our economy and society*. London, UK: Demos. Available online at: <http://www.demos.co.uk/files/proamrevolutionfinal.pdf> [Accessed: 14th August 2014].

⁸ Bruns, A. (2007) *Prodsusage: Towards a Broader Framework for User-Led Content Creation*. Available online at: [http://snurb.info/files/Prodsusage%20\(Creativity%20and%20Cognition%202007\).pdf](http://snurb.info/files/Prodsusage%20(Creativity%20and%20Cognition%202007).pdf) [Accessed: 14th August 2014].

⁹ Bruns, A. (2008) *Blogs, Wikipedia, Second Life, and Beyond: From Production to Prodsusage*. New York, NY: Peter Lang. pp. 9-38

which emerges from this shift and blurs the lines between the previously contrasting concepts of production and consumption, has been studied extensively over the past years. On the one hand, it has been harshly criticised for allegedly causing a corrosion of all cultural life prior to the Internet. The critic Andrew Keen for example points out that the spreading of amateur material online has endangered the mainstream entertainment economy by replacing experts and professionals with amateurs. In his book *The Cult of the Amateur: How the Internet is killing our culture*, he argues that “the cult of the amateur has made it increasingly difficult to determine the difference between reader and writer, between artist and spin doctor, between art and advertisement, between amateur and expert”. Keen states that the result of this is “the decline of the quality and reliability of the information we receive”.¹⁰ On the other hand, however, theorists such as Pierre Lévy¹¹ and Howard Rheingold believe in the political and social importance of participatory media, vehemently defending these new cultural changes. Rheingold, for example, believes that by embracing collective and collaborative creativity and by engaging the audience, participatory media can help in shaping a more democratic society. He expresses this view in the book *Net Smart: How to Thrive Online* with the following words:

“We’re in the early years of a participatory culture. People who think of themselves as capable of creating as well as consuming are different kinds of citizens, and our collective actions add up to a different kind of society.”¹²

Rheingold sees the rise of participation in media as an opportunity to transform our culture of passivity, our culture of the spectacle, into a culture of activity, which empowers the individual. He believes that participatory culture can activate the public’s capacity for political thought and motivate the individual to

¹⁰ Keen, A. (2008) *The Cult of The Amateur: How Today’s Internet is Killing Our Culture*. London, UK: Nicolas Brealey Publishing. p. 27

¹¹ Lévy, P. (1997) *Collective Intelligence*. Cambridge, Massachusetts: Perseus Books. pp. 1-10

¹² Rheingold, H. (2012) *Net Smart: How to Thrive Online*. Cambridge, Massachusetts: MIT Press. pp. 239-253

recognise his or her political, communal and social power and impact.¹³ The possibilities that participatory culture offers for the creation of a more democratic way of life and exchange of knowledge have also been noted by Henry Jenkins, who in his conclusion to the book *Convergence Culture: Where Old and New Media Collide* writes:

“We are in a critical moment of transition during which old rules are open to change and companies are forced to renegotiate their relationship to consumers. The question is whether the public is ready to push for greater participation or willing to settle for the same old relations to mass media.”¹⁴

On whichever side of the debate concerning participatory culture one may stand, the impact that the rise of produsage has had on the creative economy is undeniable. Whilst user-generated forms of cultural production such as the meme or the Let’s Play are flourishing, the established creative and cultural industries that used to function under an enterprise-led mass media model of production, are struggling to keep up and adapt. Perhaps one of the most drastic examples of this is the music industry. According to the RIAA, ever since the impact of online piracy on this industry, album sales have continued to plummet. The industry that generated a total annual revenue of \$38 billion in the US, at its peak in 1999, has suffered such a tremendous low that this number has dropped by 64% over the past two decades.¹⁵ Nonetheless, even after the disappearance of peer-to-peer sharing sites like Napster, which were commonly blamed for this crisis throughout the early 2000s, most people today still opt for the streaming of their favourite music online. This is however not purely an economic decision. Often overlooked in this debate is the fact that the option of publicly commenting

¹³ Rheingold, H. (2008) “Using Participatory Media and Public Voice to Encourage Civic Engagement.” In: Bennett, W. L. (2008) *Civic Life Online: Learning How Digital Media Can Engage Youth*. Cambridge, Massachusetts: MIT Press. pp. 97–118

¹⁴ Jenkins, H. (2006) *Convergence Culture: Where Old and New Media Collide*. New York, NY: New York University Press. p. 254

¹⁵ RIAA (1973 - 2014) *RIAA Statistics*. Available online at: <http://www.riaa.com/shipmentfaq.php> [Accessed: 14th August 2014].

on the music, embedding it on personal blogs and social media posts, and interacting with other music fans is yet another advantage that, for many, makes the option of streaming music on YouTube more attractive than a purchase from a store. Whilst the television industry has not yet suffered in the same way as the music industry, it is also endangered. Television channels find themselves in a constant need to innovate, always looking out for new ways to engage their audience more deeply in order to compete with the vast amount of online media that threaten to replace their services. Increasingly dependent on the viewer's participation to retain ratings, audiences are invited to vote for their favourite contestant on reality TV shows and casting shows such as *X Factor* or *Big Brother*. Other attempts at improving audience engagement and generating interaction have included the integration of live tweets from viewers during news and sports programmes.¹⁶ Television channels have also found themselves forced to make their content available for online streaming. The BBC for example has done this via the BBC iPlayer whilst Channel 4 uses the online streaming platform 4OD. A similar trend can be witnessed also in the film industry. Subscription services, such as Netflix and Hulu, offering entire movie catalogues for a monthly fee, are gaining increasing popularity whilst DVD or BluRay renting services like Blockbuster have gone bankrupt. Online streaming revenue has even been projected to surpass box office revenue by the year 2017.¹⁷ The figure of the cinephile is, as Susan Sontag described in her nostalgic and pessimistic New York Times article *The Decay of Cinema* from 1996, a disappearing specimen.¹⁸ However, unharmed, or perhaps even fuelled by these changes, stands the video games industry. The video games industry is expected to continue growth in global revenue from \$68 billion in 2013 to \$96 billion in

¹⁶ Twitter (2014) *TV x Twitter: New findings for advertisers and networks*. Available online at: <https://blog.twitter.com/2014/tv-x-twitter-new-findings-for-advertisers-and-networks> [Accessed: 14th August 2014].

¹⁷ Beaumont-Thomas, B. (2014) "Film streaming and downloads to overtake box office in 2017". In: *The Guardian*. June 4th. Available online at: <http://www.theguardian.com/film/2014/jun/04/film-streaming-downloads-dvd-netflix> [Accessed: 14th August 2014].

¹⁸ Sontag, S. (1996) "The Decay of Cinema". In: *The New York Times*. February 25th. Available online at: <http://www.nytimes.com/1996/02/25/magazine/the-decay-of-cinema.html> [Accessed: 14th August 2014].

2018¹⁹ and the reason for this success is simple: deeper immersion and deeper interactive engagement. As Frank Rose notes in his book *The Art of Immersion*, the storylines of games put the user in the forefront of the experience. Whilst the action we witness through narrative in film, TV series or novels involves the audience only as passive observers, narratives in game design provide the players with action that is directly experienced by them. It turns the user into a character essential for the progression of the storyline, answering to the demands of the increasingly interactive audience of today's participatory culture better than the traditional music, television and film industry.²⁰

Although the public's demand for participation in media has affected all of the previously mentioned creative and cultural industries, and all of them require continuous reform in order to compete with the rise of produsage to survive and to maintain their relevance in the modern day, the focus of this thesis is on the reform and survival of the film industry. How the medium of film can adapt to this participation-driven new creative economy is the question at the heart of this piece of research. Both narrative theory surrounding the concept of interactive film and recent technological trends and developments in video technology, several of which hint at a revival of film in a more immersive and interactive form, will be studied and analysed over the following two chapters. However, this interactivity also raises the question of where the line between interactive film and the video game must be drawn. This thesis is therefore not only concerned with the future of film or the film industry, but also with the development of a potential new medium that could emerge from the fusion of these two media. This new medium could replace the two at once, adapting the most invaluable elements of both for the participation and interaction-driven modern day. Ultimately, the aim of this thesis is to demonstrate that the film and the video game are two compatible art forms and that their fusion is foreseeable,

¹⁹ DFC Intelligence (2014) *DFC Intelligence Forecasts Global Video Game Industry to Reach \$96B in 2018*. Available online at: <http://www.dfcint.com/wp/?p=358> [Accessed: 14th August 2014].

²⁰ Rose, F. (2012) *The Art of Immersion: How the digital generation is remaking Hollywood, Madison Avenue, and the way we tell stories*. New York, NY: W. W. Norton & Company. pp. 1-8

that the emotional impact of film and live action footage can be used to great effect in the creation of video games and equally, that video game interactivity and spatial immersion can be integrated to great effect in the medium of film. In this sense, this thesis attempts to build on Frank Rose's forward-thinking statement: *"Combine the emotional impact of stories with the first-person involvement of games and you can create an extremely powerful experience."*²¹

²¹ Ibid. p. 15

2

THE ELECTRONIC POV SHOT, 360-DEGREE FILMMAKING AND OTHER RELEVANT TRENDS AND DEVELOPMENTS IN THE FILM AND VIDEO GAME INDUSTRY

Over the last decade the world has seen various rapid advances in video recording and filmmaking technology. One notable trend is towards subjective first person camera perspectives, and the construction of increasingly smaller, more compact and more lightweight filmmaking equipment aimed at this purpose. Amateur videos recorded with so-called ‘action cameras’, pocket-sized digital video cameras that are mountable to a person’s body (often to the head) or to vehicles, have taken the online world by storm. First person skating and snowboarding videos, first person deep-diving and bungee jumping videos and other first person action sports videos have risen to extreme popularity on YouTube and similar sites as a result of the integration to the mass market of cameras such as the GoPro or its competitors, for example, the Sony Action or the CamOne. But also non-sports-related uses for this type of wearable camera have proven to be a hit. In 2013, a video of the first person perspective of an eagle’s flight was achieved by strapping a GoPro camera around the eagle’s back. The video has reached 8 million views on YouTube as of June 2014.²² Also, the use of first-person vision (FPV) technology to record casual everyday-life situations is about to kick-start as smart-glasses such as the Google Glass and the Meta Pro have entered the market.²³ Whilst these smart-glasses aim to substitute the smartphone in their functionality, they allow its users to record video from a first-person perspective by wearing them, and their in-built cameras, just like any other pair of glasses. This indicates that the first person perspective may be

²² Srachi YouTube Channel. (2014) *Flying eagle point of view #1* [Online Video]. Available online at: <https://www.youtube.com/watch?v=G3QrhdfLC08> [Accessed: 17th August 2014].

²³ Morerio, P., Marcenaro, L.; Regazzoni, C.S. (2013) “Hand Detection in First Person Vision” In: *Information Fusion (FUSION), 2013 16th International Conference Paper*. Available online at: <http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=6641179> [Accessed: 17th August 2014].

about to become the new standard perspective of home video recording. It comes as no surprise, given these developments, that even in mainstream cinema and television the use of first person perspectives has established itself as an increasingly popular filmmaking technique. In the modern day the POV shot is increasingly used from a subjective rather than an objective angle. In a subjective POV shot the camera takes the place of the protagonist's eyes, facilitating the viewer's identification with the character. This is opposed to the objective POV shot in which the camera merely moves closer to the protagonist's side, allowing the viewer a similar perspective to the protagonist without, however, causing any deeper identification.²⁴ Whilst the latter type of POV shot has long been a recurring cinematic resource for filmmakers to a more or less successful degree, subjective POV experiments rarely proved artistically or commercially successful in the early days of cinema. Whilst today we are accustomed to seeing subjective first-person perspectives in music videos (e.g. Prodigy's *Smack my Bitch Up*), TV series (e.g. Channel 4's *Peep Show*) or feature films (e.g. Gaspar Noé's *Enter the Void*), the history of this technique in mainstream filmmaking is one full of exasperation on behalf of film critics. In 1947, during the experimental days of the early film noir, the actor turned director Robert Montgomery set out to shoot his feature film *The Lady in the Lake* exclusively from the first person perspective of its protagonist. Although it is considered a classic piece of video game history for its pioneering subjective POV shots, which as Bob Rehak points out, proved highly compatible with the interactivity of video games, serving as an early inspiration for the development of the first person shooter, the film did not fare quite as well with the film press of its time.²⁵ The film's critical reception was characterised by scepticism towards the efficacy of the first person angle that the film maintained throughout its 105 minutes running time. A New York Times review from 1947 for example, contained the following criticism:

²⁴ Mascelli, Joseph V. (1965). *The Five C's of Cinematography: Motion Picture Filming Techniques Simplified*. Hollywood, California: Cine/Grafic Publications. pp. 11-67

²⁵ Rehak, B. (2003) "Playing and Being: Psychoanalysis and the Avatar". In: Wolf, Mark J. P. and Perron, Bernard. (2003). *The Video Game Theory Reader*. New York, NY: Routledge. p.120

*“In making the camera an active participant, rather than an off-side reporter, Mr. Montgomery has, however, failed to exploit the full possibilities suggested by this unusual technique.”*²⁶

The review seemed to express the general consensus of the time regarding the use of the POV shot subjectively. Although interest in the technique and recognition of its innovativeness were revealed, its subjective POV technique was generally perceived as too confusing and frustrating for the audience to enjoy. Whilst *The Lady in the Lake* was only Robert Montgomery’s directorial debut, star directors of the time that showed interest in the first person narration possibilities of POV shots had no better luck turning the technique into a respectable filmmaking practice either. The film *Dark Passage* from the same year, directed by Delmer Daves and starring Humphrey Bogart and Lauren Bacall, left critics of the time equally unimpressed.²⁷ Another nowadays widely celebrated filmmaker who was interested in the subjective POV technique but never proceeded to turn his visions into reality was Orson Welles. Welles put forward the idea of directing an adaptation of Joseph Conrad’s *Heart of Darkness* shot entirely from the protagonist’s first person perspective in keeping with the first person narration of the original novel but abandoned the concept as unrealistic.²⁸ This subjectivity was perceived as an unnecessary obstacle, clashing with the observational third person nature of the cinematic experience. Nowadays, however, this perception has shifted. The subjective POV shot is today a much-needed technique to retain an audience’s attention. As attention

²⁶ Pryor, Thomas M. (1947) “Lady in the Lake At the Capitol” In: *New York Times*. January 24th. Available online at: <http://www.nytimes.com/movie/review?res=9C04E3DE123EEE3BBC4C51DFB766838C659EDE> [Accessed: 17th August 2014].

²⁷ Crowther, B. (1947) “Dark Passage, Warner Thriller, in Which Humphrey Bogart and Lauren Bacall Are Chief Attractions, Opens at Strand” In: *New York Times*. September 6th. Available online at: http://www.nytimes.com/movie/review?_r=1&res=9901E6DA153AE233A25755C0A96F9C946693D6CF [Accessed: 17th August 2014].

²⁸ Hinkson, J. (2011) *Through the Camera’s Eye: Experiments with Subjective Camera in Film Noir*. Film Noir Foundation. Available online at: <http://filmnoirfoundation.org/sentinel-article/NoirCity-emag-Camera.pdf> [Accessed: 17th August 2014].

spans decrease, the need for stronger immersion and interactivity increases. We know that this need is fulfilled by the video games industry in which the player is constantly immersed in the action and most commonly perceives the virtual world of gameplay from a subjective first person perspective. Whilst in the same sense, the amount of subjectivity required to hold an audience's attention has also increased within the film industry, filmmakers still struggle to find a format in which this new demand is met. On the one hand are those that hold onto a golden age of cinema refusing to recognise the unchangeable and deep impact of the video game and digital media on pop culture. On the other hand are those that aim for a cinema more reminiscent of video games via the use of computerised aesthetics, not necessarily making cinema any more immersive or interactive therewith. Often these attempts also fail to impress the critics due to neglect of strong narratives and plots in favour of visual effects and hectic camera movement. Both sides struggle with a way of positively dealing with the realisation that the modern audience, unlike the audience of traditional cinema, appreciates both a direct identification and involvement with the protagonist, as well as agency over the action. Alexander R. Galloway points out in his book *Gaming: Essays on Algorithmic Culture* that whilst the subjective POV shot in cinema has a marginalised position and is traditionally only used to represent anguish, intoxication, drowsiness or similar negative emotions, in the video game industry its function is entirely different. He observes that in video games the subjective POV angle is used instead "to achieve an intuitive sense of affective motion". Galloway therefore argues that due to the influence of the gaming industry, the function of the subjective POV shot has changed even in regards to cinema. He states: "The traditional POV shot has fallen away and an electronic one has taken its place"²⁹. Whilst at the time of its release, critics weren't ready to fully appreciate Montgomery's subjective POV filmmaking, *The Lady in the Lake* is now hailed as one of the key pioneering works behind the 'electronic POV shot', which is gradually invading our computer, tablet and television screens. Especially today, in the age of action-sports cameras and FPV technology, the

²⁹ Galloway, A. R. (2006) *Gaming: Essays on Algorithmic Culture*. Minneapolis, Minnesota: University of Minnesota Press. pp. 39-69

film's subjective camera technique could potentially serve as a basis for a new form of first person narrated interactive film, which could approximate the medium of film to the video game one step further.

Another very recent technological development that shines a completely new light on the concept of interactive and immersive film, and expands our realistic expectations regarding the amount of spatial immersion achievable with live action video footage, is the integration of the 360-degree video camera to the mainstream filmmaking market. Several brands such as Bubl, Geonaute, Jaunt, Giroptic and EyeSee360 have announced the release of 360-degree video cameras, most of which are currently available to pre-order from the manufacturers' websites. Delivery is expected to start in Autumn 2014. Generally similar in size and weight to the GoPro and its competitors, they also follow in the same marketing tradition in the sense that they are targeted primarily at pro-am action sports practitioners. As an alternative to these cameras, there are also 360-degree lens attachments for DSLRs for the more seasoned photographer or filmmaker with no need for mobility and compact lightweight equipment, such as those manufactured by Eye Mirror and O-360. Even 360-degree attachments for iPhones or Androids aimed at the home-video hobbyist are now available on the market. These are manufactured by brands such as Kogeto or GoPano. Although panoramic 360-degree photography has been around for a long time and constitutes the basis for interactive virtual tours, Google Maps street view, and other online media of this sort; the option of recording panoramic 360-degree video has until now been a complicated process that required the stitching together of video footage from multiple cameras recording simultaneously. The possibilities and options provided by the simplification of this technology in the mainstream market are of course enormous in regards to filmmaking. Since the human eye does not naturally possess 360-degree vision, the 360-degree camera allows the viewer to witness video footage in a way that expands far beyond his or her usual perceptive capacities. 360-degree video can be captured and projected in a variety of different ways. The two main types of projections that can be used for the playback of a fully spherical panoramic video with a field of view of $360 \times 180^\circ$ are:

- a) Equirectangular projections (also referred to as 'standard projections'). Geometrically speaking, this projection maps the latitude and longitude coordinates of a sphere onto a flat surface, maintaining its vertical and horizontal lines and curving all other lines. This makes the whole field of view of $360 \times 180^\circ$ viewable by the human eye at once, cropping the full panorama into a rectangular shape. Most spherical panorama viewers and stitching software use the equirectangular format as their default setting. This has resulted in its recognition as a standard for spherical panorama exchange.³⁰
- b) Stereographic projections (also known as 'small planet projections'). This projection maps a full sphere onto a flat surface using polar coordinates. It also makes the entire $360 \times 180^\circ$ panorama viewable by the human eye at once, but in a distorted angle that is particularly unnatural to the human vision. It has nonetheless gained some recognition as an artistic tool due to its tunnel effect and its circular appearance that can resemble the shape of a planet.³¹

Most important, however, is the inherent suitability for interactivity and spatial immersion these types of projections offer when put in combination with a 360-degree compatible media player. In the early days of panoramic video experimentation, 360-degree video had to be projected on actual tangible circular surfaces or screens surrounding a cinema audience. Usually the types of projections used at the time were semi-spherical predecessors of the equirectangular projection and did not allow interaction. This is the case for example with early experiments such as the Circlorama, which used 11 separate anamorphic projections to create a semi-spherical field of view of $360 \times 146^\circ$

³⁰ PTGui, New House Internet Services B.V. (2009) *PTGui - Panorama Tools: Graphical User Interface*. Available online at:

<http://www.ptgui.com/man/projections.html> [Accessed: 17th August 2014].

³¹ Ibid.

altogether,³² or the Swissorama, which used a cylindrical projection and a semi-spherical field of view of 360x35°.³³ Nowadays, however, in combination with a digital 360-degree compatible media player, we can display fully spherical 360-degree footage on a computer screen, giving the viewer the option of rotating his or her view during playback in all possible directions. When using the equirectangular projection, this is achieved by selecting only a small fraction of the 360x180° field of view in the centre of the sphere, making the image at first glance appear like any regular video, only enhanced with an additional option of interactive view rotation. The stereographic projection presents an alternative as it comprises of an additional compression parameter, which by reducing compression equally allows the image to morph into what at first glance appears to be a regular video. It does so by moving the viewpoint from the polar centre to the centre of the sphere. In other words, both equirectangular and stereographic 360-degree videos allow the viewer or interactor to be placed in the centre of the spherical panorama. This is similar to the way we rotate our view on Google maps or in virtual tours. View rotation can be triggered on a computer by mouse, clicking and dragging on the video itself, or on touchpad devices such as the iPad or Android tablets, by swiping across the screen with a finger. Many tests of this 360-degree video technology have already been published on the Internet. On the official Mercedes Petronas Formula 1 website a 360-degree video from the company Visualize shows an in-cockpit race around the Silverstone circuit.³⁴ A deep sea diving 360-degree short film produced by the company 360Heroes with Fabien Cousteau is also available on the official website of Time Magazine.³⁵ The company Making View has equally released various videos testing their 360-

³² Jensen, H. (1963) "The new "Circlorama" cinema in London". In: *Kino-Technik Nr.7*. Available online at: <http://www.in70mm.com/news/2004/circlorama/index.htm> [Accessed: 17th August 2014].

³³ Piccolin, L. (2004) *All-Around Cinema: Ernst A. Heiniger's Swissorama*. Available online at: <http://www.in70mm.com/news/2004/swissorama/> [Accessed: 17th August 2014].

³⁴ Visualize. (2014) *F1 W05360 VIDEO* [Online Video]. Available online at: <http://www.mercedesamgf1.com/en/car/f1-w05-360-video/> [Accessed: 17th August 2014].

³⁵ Cousteau, F.; 360Heroes. (2014) *Deep Dive* [Online Video]. Available online at: <http://time.com/cousteau/> [Accessed: 17th August 2014].

degree video technology during a Red Bull Scramble motocross race³⁶, a speedflying session with the Norwegian athlete Jokki Summer³⁷ and other similarly adrenaline-infused events. Apart from this, many of the camera manufacturers such as Bubl and Eye Mirror have uploaded videos of themselves and other companies testing their equipment. These videos include everything from 360-degree skydiving³⁸ to bicycle rides around the office with a 360-degree camera attached between the handlebars.³⁹ The majority of the camera manufacturers also design their own optimised media players in order to ease the playback of the 360-degree footage, and most of these are also embeddable on blogs and websites. However, standalone 360-degree video players such as Kolor Eyes released by Kolor and Finwe have also been made available for iOS, Android and desktop computers.⁴⁰ Another online option for the playback of interactive panoramic videos is the JavaScript API WebGL, which is compatible with HTML5 and is primarily used for the rendering of interactive 3D graphics. An interactive music video by Chris Milk for Danger Mouse's project 'Rome' titled *Three Dreams of Black*, which used WebGL, featured a section in which the viewer had the possibility to rotate his or her view to either side of an animated train track⁴¹. Making View's own web player also runs with WebGL.

³⁶ Making View. (2013) *Red Bull Hare Scramble* [Online Video]. Available online at: <http://www.makingview.com/portfolio/red-bull-hare-scramble-2013/> [Accessed: 17th August 2014].

³⁷ Making View. (2013) *Speedflying Lofoten* [Online Video]. Available online at: <http://www.makingview.com/portfolio/speedflying-lofoten-360-experience/> [Accessed: 17th August 2014].

³⁸ Bubl; Skydiving Toronto. (2013) *See bubl In the Sky with Skydiving Toronto* [Online Video]. Available online at: <http://www.bublcam.com/portfolio/see-bubl-in-the-sky-with-skydiving-toronto/> [Accessed: 17th August 2014].

³⁹ Bubl; Popular Mechanics (2013) *Bubl Bike Tour of Popular Mechanics Office*. [Online Video]. Available online at: <http://www.bublcam.com/portfolio/popularmechanics/> [Accessed: 17th August 2014].

⁴⁰ Kolor (2014) *MWC2014: Kolor & Finwe launch Kolor Eyes for Android (free 360-degree video player)*. Available online at: <http://www.kolor.com/blog-en/2014/02/25/kolor-finwe-launch-kolor-eyes-for-android-free-360-degree-video-player-join-the-beta-program/> [Accessed: 17th August 2014].

⁴¹ Milk, C. (2011) *Three Dreams of Black*. Available online at: <http://www.ro.me> [Accessed: 17th August 2014].

As aforementioned, all of these videos currently allow viewers to rotate the view with a touchpad or mouse. However, this is not the end of the road either as many camera manufacturers are currently carrying out experiments with virtual reality headsets such as the Oculus Rift and the Sony Morpheus. In these, the head movement of the viewer with the mounted VR headset serves as trigger for view rotation within a 360-degree video. The production company Condition One is even developing a first 360-degree half-an-hour-long documentary film optimised for the Oculus Rift. This film will be titled *Zero Point* and will use Ultra HD 3D technology to create an even greater sense of immersion.⁴² Although the only interaction 360-degree video allows at the moment is view rotation, the next step for this type of video technology could consist in the integration of motion-sensors to trigger certain elements within the video. Motion sensing controllers such as Microsoft's Kinect, Sony's PlayStation Move or Nintendo's Wii remote have long been used in the video game industry to synchronise the virtual gameplay action with the real life motions of the player. This could easily be introduced to interactive film in the same way as it is applied in the gaming industry, allowing viewers to activate certain elements in the video with body motions. An early example of this technology being used in cinematic experiments is another Chris Milk project entitled *The Treachery of Sanctuary*. It was exhibited at the Digital Revolution exhibition in the London Barbican Centre for the first time in the UK in July 2014. The installation used motion detection to recreate a silhouette of the interactor on a screen. The interactor would raise his or her hands, triggering the descent of an animated flock of birds from the sky. The birds would then devour the silhouette on the screen from top to bottom.⁴³ Apart from tests with head mounted displays and motion controllers, there are many experiments being carried out with other devices that equally aim to

⁴² Gamasutra (2014) *Condition One unveils first interactive trailer for upcoming Oculus Rift 3D 360-degree film "Zero Point"* (Press Release). Available online at: <http://www.gamasutra.com/view/pressreleases/211147/> [Accessed: 17th August 2014].

⁴³ Barbican (2014) *Digital Revolution: An immersive exhibition of art, design, film, music and videogames* (Press Release). Available online at: <http://www.barbican.org.uk/bie/upcoming-digital-revolution> [Accessed: 17th August 2014].

increase the quality of synchronisation between virtual reality and real life during interaction. For example, an experiment performed on the Channel 5 programme *The Gadget Show* from 2011 showcased various devices the production crew used in an attempt to build the most realistic Battlefield 3 simulator possible.⁴⁴ Marketed as “*the hardware link between the live and virtual domains*”, one of these devices was the Omnidirectional Treadmill from MSE, a treadmill designed to give the player a sensation of movement parallel to his or her movement within the virtual world. Similar machines to this, also targeting the gaming industry with the promise to allow natural movement in virtual reality include the Virtusphere and Virtuix Omni.

As the subjective first person camera perspective, 3D and 360-degree video recording combine, and virtual reality technology advances, interactive filmmaking steps out into completely new terrain. The ability to spin and look around inside live action footage, or in other words, the ability to turn one’s virtual head in a pre-recorded world, reminds of the type of interactivity and spatial exploration that traditionally characterised the video game. As we have determined, in the future this could even include interaction not only on a visual level but could also include the participant or viewer’s motions to trigger certain elements. 360-degree live action footage is not yet, but has the potential to be, navigable in the same way in which a video game is navigable. These developments in video technology show that the immersive and interactive capabilities that are currently giving the games sector such an advantage in terms of audience engagement and retention are not restricted to this art form and that they can also be integrated into the medium of film. However, this new type of immersive and interactive film would share as many similarities with the narrative conventions of video games as it would share with those of cinema, blurring the line between the video game and the film to a nearly indistinguishable level and rendering a large part of the narrative theory based

⁴⁴ The Gadget Show, Channel 5 (2011) *Ultimate Battlefield 3 Simulator - Build & Test*. [Online Video] Available online at: <https://www.youtube.com/watch?v=eg8Bh5iI2WY> [Accessed: 17th August 2014].

around traditional 20th century cinema inapplicable. In order to understand how these new game-like technologies and trends could be implemented in the medium of film, or in other words, how live action footage could be implemented in the video game in the most engaging and enticing and least disorientating way, the next chapter is dedicated to the analysis of contemporary narrative theory surrounding the concept of interactivity.

3

INTERACTION-COMPATIBLE MODELS OF NARRATIVE IN NEW MEDIA, FILM AND VIDEO GAME THEORY

One of the most important models of narrative found in association with the concept of interactive film is the 'Hyper-Narrative'. The author, academic and director of the interactive feature-film *Turbulence*, Nitzan Ben Shaul, defines 'Hyper-Narratives' as all those narratives in which the viewer or participant experiences a shift between different narrative paths as a storyline or plot unfolds.⁴⁵ The concept of hyper-narrative encompasses everything from early interactive experiments with selectable storyline branches, such as Radúz Činčera's *Kinoautomat*,⁴⁶ to modern day attempts at creating a computer-automated form of database cinema, such as Lev Manovich's *Soft Cinema* project.⁴⁷ Although there seems to be a general consensus within the fields of interactive film and new media concerning the potential of the hyper-narrative, the preferred ways in which the hyper-narrative is approached, expanded upon and experimented with, differs from one practitioner and/or researcher to another. Ben Shaul points out in his book *Hyper-Narrative Interactive Cinema: Problems and Solutions* that the concept of hyper-narrative is approached primarily from two differing angles. One is a constructivist approach, which he himself favours. The other is a postmodernist approach, which he opposes. 'Constructivist Hyper-Narrative Cinema' plays with the idea of a set of pre-defined narrative paths, which result in different plot outcomes. When used interactively, this type of narrative holds on to the ideal of the participant in a

⁴⁵ Ben Shaul, N. (2008) *Hyper Narrative Interactive Cinema: Problems and Solutions*. Netherlands: Rodopi. p. 15

⁴⁶ Huhtamo, E. (2007) "Push the Button, Kinoautomat will do the Rest! Media-archaeological Reflections on Audience Interactivity" In: *Kinoautomat (DVD+Booklet)*. Available online at: http://gebseng.com/media_archeology/reading_materials/Erkki_Huhtamo-Kinoautomat.pdf [Accessed: 17th August 2014].

⁴⁷ Manovich, L. (2005) *Soft Cinema: Navigating The Database* (DVD+Booklet). Cambridge, Massachusetts: MIT Press.

role that is limited in regards to his or her influence or control over the actual narrative content. On the other hand, 'Postmodernist Hyper-Narrative Cinema' is based on the ideal of automatically generated and, according to Ben Shaul, often complex and disorientating narratives that rely on data algorithms and hypertexts. In regards to interactivity, the ideal is to give the viewer a generous amount of influence or control over the narrative development, turning him or her into an active force inside the film.⁴⁸

These findings correlate also with Jeffrey Shaw and Peter Weibel's observations in the introduction to the book *Future Cinema: The Cinematic Imaginary after Film*. Although Shaw and Weibel remain neutral, they also describe two main paths that cinematic experiments have seemed to follow in their quest for interactivity over years of exhibitions and screenings at the ZKM Institute for Visual Media in Karlsruhe, Germany. One approach attempts to "*transform cinema's compulsive spectator-spectacle relationship*" by "*developing modular structures of narrative content that permit indeterminate yet meaningful numbers of permutations*". Interactive works of this type, as Shaw and Weibel explain, use various prefabricated storyline developments over which the participant is given limited control, or even just an illusion of control. The other path Shaw and Weibel observe is concerned with revolutionising cinematic narrative by "*involving the algorithmic design of content characterizations that would permit the automatic generation of narrative sequences that the user could modulate*". Interactive works of this type turn the viewers into inhabitants of the film. Viewers become agents and protagonists actively influencing the structure of the film's unpredictable narrative in real time.⁴⁹ One can see that the former approach is, in essence, identical with Ben Shaul's description of the constructivist approach he supports, and the latter is identical to the postmodernist approach he refuses. As Shaw and Weibel go on, they start labelling those works that Ben Shaul would class as pertaining to the

⁴⁸ Ben Shaul, N. (2008) *Hyper Narrative Interactive Cinema: Problems and Solutions*. Amsterdam, Netherlands: Rodopi. pp. 15-37

⁴⁹ Shaw, J.; Weibel, P. (2003) *Future Cinema: The Cinematic Imaginary After Film*. Cambridge, Massachusetts: MIT Press. pp. 19-27

constructivist fashion as 'Transcriptive Works', whilst categorising those following the postmodernist method under the label of 'Recombinatory Works'.

The reasoning behind Ben Shaul's dismissal of recombinatory or postmodernist hyper-narrative in interactive film, and his argument for an adoption of transcriptive or constructivist hyper-narrative as a standard for interactive filmmaking, is his belief that the former model splits the viewer or participant's attention between behavioural and cognitive activity. Ben Shaul believes that this split attention causes the viewer or participant to engage less with the narrative. He also argues that postmodernist hyper-narrative rarely achieves coherence between different narrative paths and neglects the need for a dramatic succession and closure, which he believes are essential elements for the viewer to be satisfied with his or her cinematic experience. Ben Shaul therefore argues that theorists and practitioners that promote this type of interactive film, such as Lev Manovich, erroneously presume that the capabilities of digital technology in the computer age automatically imply that there is a demand and an audience for their exploitation in the field of film.⁵⁰ Shaul also proposes that the participant should not be allowed to identify with the role of the protagonist but should instead be encouraged to regard the protagonist as a fictional companion he or she can relate to from a third person perspective. Shaul believes that if there are too many options for interaction, too many narrative branches at once, or worse if the viewer is given too much behavioural control over the plot, then he or she is more likely to become confused and frustrated with this new participatory role, losing interest in what happened before or after each interaction. Instead, when there are fewer options, giving the viewer alternative narrative branches that do, however, remain integral to the pre-defined storyline, then this array of disposable options can add curiosity and excitement to the participant's experience. Shaul concludes this reasoning with the belief that interaction in film must be used to surprising, distracting, diverting or

⁵⁰ Ben Shaul, N. (2008) *Hyper Narrative Interactive Cinema: Problems and Solutions*. Amsterdam, Netherlands: Rodopi. pp. 23-30

postponing effect but the viewer mustn't be able to behaviourally influence the outcome of the pre-established plot at any point.⁵¹

Another opponent of the postmodernist or recombinatory approach to interactive film is Grahame Weinbren. Weinbren, who himself exhibited, throughout the 1980s and 1990s, various interactive cinema installations that would belong in the constructivist or transcriptive category, also argues that the audience's lack of impact in cinema is one of its appeals in its traditional form. He believes that cinema's main strength consists in the viewer's inability to intervene, and that this is destroyed once the viewer is incorporated in the action. Weinbren gives the example of the Hitchcock classic *Psycho* and states that if the audience had any impact on the plot its whole experience of suspense would be corrupted. Weinbren recognises that this problem with interactive film lies in its relationship to time. This is because traditional cinema inherently follows a linear temporality whilst for it to be compatible with user interaction the sequence of events in which interactivity occurs would have to follow an open or indeterminate one. Weinbren argues therefore that in order to find a model of interactivity for film that will be appealing to the viewer and will maintain the suspense, a 'new cinematic grammar' in regards to temporality must be found. He proposes a narrative structure of A-B-A in which the A segments remain unchanged by the viewer and the B segment gives the viewer the option to interact. The A segments maintain a linear temporality and the B segment an indeterminate open one. However, because of the A-B-A structure, which leads the plot back to the same point regardless of what happens during the B segment, the outcome of the pre-established plot remains unaffected by the interaction.⁵² This narrative structure Weinbren describes closely resembles that which many video games follow to connect gameplay with linear narratives. For instance, mission-based games in which the player is asked to complete a set of tasks during interactive gameplay as a prerequisite for the story to take its toll

⁵¹ Ibid. pp. 83-85

⁵² Weinbren, G. (1995) "Another Dip into the Ocean of Streams of Story" In: Shaw, J.; Weibel, P. (Ed.) (2003) *Future Cinema: The Cinematic Imaginary After Film*. Cambridge, Massachusetts: MIT Press. pp. 260-271

often feature a cut-scene immediately before the gameplay. This cut-scene could be considered as the first A segment. The interactive gameplay then constitutes the B segment. Here, temporality is open and the duration of gameplay until the completion of the given mission is dependent on the player. Once completed however, we get a new cut-scene of linear temporality with which the storyline further unfolds. This would then be the next A segment. In video game theory, these A segments can be described as having an 'Embedded or Fixed Narrative', as opposed to the B segment, the interactive element, which could be described as having a 'Ludonarrative'.⁵³ Examples of this type of game are numerous. Popular examples include Activision's *Call of Duty* or Remedy Entertainment's *Max Payne*.

As we have already determined, advocates of the transcriptive or constructivist hyper-narrative in interactive film, such as Ben Shaul and Weinbren, defend and aim to preserve a semi-passive role for the viewer in favour of linear pre-established storylines. Their ideal of interactivity is also not influential in regards to plot progression. Recombinatory or postmodernist hyper-narratives differ strongly from this view. In contrast to advocates of constructivist or transcriptive hyper-narratives, advocates of recombinaory or postmodernist hyper-narratives fully embrace the idea of multiple unascertainable scenarios and a complex amount of automatically generated non-linear plot structures. Their ideal of interactivity also differs in the sense that they grant the viewer or participant an entirely active and participatory role in regards to the narrative development. Postmodernist hyper-narrative practitioners argue that because of the impact of computers on our everyday lives; there have been changes in the ways we perceive film. They believe that due to this shift of perception, traditional cinematic narrative has lost its ability to engage and sustain the viewer's attention in the way it used to. Therefore, the emphasis is placed on the possibility of creating new complex multidimensional narratives based on the calculative power of computers. Lev Manovich, one of the main theorists and

⁵³ O'Hagan, M.; Mangiron, C. (2013) *Game Localization: Translating for the global digital entertainment industry*. Amsterdam, Netherlands: John Benjamin's Publishing Company. p.151

practitioners in this field, mentions that whilst in the past “*narrative arts have always been limited by the capacities of the receiver (a human being) and of storage media*”; the capacities of storage media today have changed dramatically due to digital technology. He then argues, based on this, that the automation of processes such as the indexing, classification and filtering of databases of audio-visual content through software can be used to create a new enticing form of cinema.⁵⁴ He showcases this potential use of the database in the medium of film in his work *Soft Cinema*, produced alongside Andreas Kratky. By using software programmed to arbitrarily choose bits of recorded material from a database, Manovich manages to generate an ever-changing but coherent film narrative. In other words, the software edits the audio-visual bits of content in real time, making choices based on certain content characterizations, and thereby creates storylines that keep changing every time the film is played.⁵⁵ Manovich has, however, faced much criticism for his notion of database and narrative as two opposites that stand in a competitive relation to one another. Two of his critics, who generally share his enthusiasm about the computerised future of film nonetheless, and whose approach to interactive narratives is equally classifiable within the postmodernist category, are Marsha Kinder and N. Katherine Hayles. Whilst Kinder shares Manovich’s interest in the database but reaches a different conclusion about its relationship to narrative, Hayles rejects the concept of database altogether. She instead prefers to use the term ‘possibility space’, which, as she argues, allows the incorporation of other types of data in its definition that cannot be included in the concept of database.⁵⁶ Both Kinder and Hayles stress the potential of data and software to enhance narratives by providing the viewer or interactor with the option of spatial exploration. This stands in contrast to Manovich’s belief in the database’s ability to replace narratives entirely. Hayles belief is that narratives can be “*transformed and*

⁵⁴ Manovich, L. (2005) “Old Media as New Media: Cinema.” In: Harries, D. (Ed.) (2005) *The New Media Book*. London, UK: BFI Publishing. pp. 209 - 213

⁵⁵ Manovich, L. (2005) *Soft Cinema: Navigating The Database* (DVD+Booklet). Cambridge, Massachusetts: MIT Press.

⁵⁶ Katherine Hayles, N. (2005) “Narrating Bits: Encounters between Humans and Intelligent Machines” In: *Vectors: Journal of Culture and Technology in a Dynamic Vernacular, Volume 1 Issue 1 (Evidence)*. p. 5

enriched by their interactions with possibility space in the complex ecologies of contemporary media and culture".⁵⁷ Kinder believes in the potential of what she calls the 'Database narrative'. She defines this concept with the following words:

*"This term refers to narratives whose structure exposes the dual processes of selection and combination that lie at the heart of all stories and are crucial to language: Certain characters, images, sounds, events and settings are selected from series of categories and combined to generate specific tales."*⁵⁸

In other words, Kinder views the interaction with database that takes place in the video game, and in software in general, as a special kind of narrative in itself. Describing her own interactive film projects, she says: *"These works are built on the assumption that spatial exploration is not an alternative to narrative but a dimension that has always been pivotal to its structure"*.⁵⁹ She also argues that narratives have three primary functions: an aesthetic, an ideological and a cognitive one. Since the player of a video game learns cognitive skills through the challenging nature of gameplay, is aesthetically pleased by the graphic design of the virtual worlds he or she is exploring, and is usually ideologically drawn into some form of 'good versus evil' storyline, Kinder defends the notion that gameplay can be seen as an extension of traditional narrative. She then leads this back to her main argument, that database and narrative are a continuum rather than two opposites.⁶⁰

In video game theory the notion of spatial exploration in gameplay as a form of narrative, is usually represented by the concept of 'emergent narrative'. Chauvin,

⁵⁷ Ibid. pp. 29

⁵⁸ Kinder, M. (2003) "Designing a Database Cinema" In: Shaw, J.; Weibel, P. (Ed.) (2003) *Future Cinema: The Cinematic Imaginary After Film*. Cambridge, Massachusetts: MIT Press. p. 349

⁵⁹ Ibid. p.347

⁶⁰ Kinder, M. (2005) "Narrative Equivocations between Movies and Games" In: Harries, D. (Ed.) (2005) *The New Media Book*. London, UK: BFI Publishing. pp. 119 – 132

Donnart, Levieux and Natkin point out five characteristics that popular video games classifiable as emergent games have in common:

- a) The main focus in these games lies on the spatial exploration of a possibility space.
- b) All narrative content is a result of the player's agency on the virtual world of gameplay. No linear narrative is in place.
- c) The player is given so much control that he or she is creating a story rather than interacting with a story. In other words, the player becomes a co-author of the story.
- d) Outcomes of the player's actions are uncertain and the narrative path is unascertainable since it emerges during gameplay.
- e) It is coherent. The possibility of inconsistencies between cut scenes and gameplay ('ludonarrative dissonance'⁶¹) is erased, since no linear narrative is in place.⁶²

The examples of Let's Play videos during the introduction to this piece of research were examples where narratives emerged from the simple exploration of a virtual space through gameplay. Although *GTA V* has a linear narrative when one follows the storyline through the game's missions, its vast open world possibilities offer enough room for emergent narratives to develop during gameplay. A game that is exclusively emergent and in which no clear linear narrative is established in the first place is Mojang's *Minecraft*. Another example is the EA game *The Sims*.

Traditionally, narrative has been defined as "*the representation of an event or sequence of events*"⁶³ or as "*the representation of real or fictive events and*

⁶¹ Hocking, C. (2007) *Ludonarrative Dissonance in Bioshock*. Available online at: http://clicknothing.typepad.com/click_nothing/2007/10/ludonarrative-d.html [Accessed: 18th August 2014].

⁶² C.E.D.R.I.C/CNAM: Chauvin, S.; Donnart, J.Y; Levieux, G.; Natkin, S. (2014) "*An Out-of-Character Approach to Emergent Game Narratives*" Available online at: http://fdg2014.org/papers/fdg2014_wip_05.pdf [Accessed: 18th August 2014].

situations in a time sequence".⁶⁴ One can see that in these definitions it is the word 'representation' that stands out. Whether in films or in novels, in stories told or songs sung, narratives in the past have always been 'represented'. However, if we were to consider the video game as a narrative art form, then this definition of narrative would need to be reconsidered. As Gonzalo Frasca states: "*unlike traditional media, video games are not just based on representation but on an alternative semiotical structure known as simulation*".⁶⁵ Whilst Frasca puts the concepts of simulation and narrative in opposition, similar to the way Manovich does with the concept of database, one could instead also argue that the ability of 'simulating' has simply expanded our possibilities of experiencing narrative content in the modern day. Nowadays, narratives must no longer only be representational, they can also be simulational. This categorisation is based on Frasca's distinction between 'simulational media' (e.g. video games) and 'representational media' (e.g. film).⁶⁶ In other words, narratives can also emerge from the simulation of events. This is a slightly broader notion of narrative, more akin to the one Marsha Kinder uses to justify her concept of a database narrative or video game theorists use to justify their notion of an emergent narrative in gameplay, but it is better adapted to the modern day and contemporary forms of media.

Based on this definition of narrative as a representation or simulation of events, the two opposing strands of thought one can distinguish in conclusion to the analysis of interactive narrative theory in this chapter, can be simplified by referring to them as 'representational' and 'simulational'. Ben Shaul's idea of a constructivist interactive hyper-narrative in which the interactor's identification with the protagonist is avoided and Weinbren's conviction that a fixed

⁶³ G n tte, G. (1980) *Narrative discourse: An Essay in Method*. Ithaca, NY: Cornell University Press. p. 12

⁶⁴ Prince, G. (1999) "Revisiting Narrativity". In: Bal, M. (Ed.) (2004) *Narrative Theory Vol.1: Major Issues in Narrative Theory Critical Concepts in Literary and Cultural Studies*. London, UK: Routledge. pp. 11 - 20

⁶⁵ Frasca, Gonzalo. (2003). "Simulation versus Narrative." In: Wolf, Mark J. P. and Perron, Bernard. (2003). *The Video Game Theory Reader*. New York: Routledge. p. 222

⁶⁶ Ibid. p. 223

temporality in the A segment of an A-B-A narrative structure is essential to interactive film, are all attempts to maintain the linear, contemplative and observational nature of representational narratives we are used to in traditional cinema. On the other hand, Kinder's postmodernist concept of database narratives, Manovich's belief in the superiority of the database over the narrative, and Hayles' belief in the spatial exploration of a possibility space are all attempts to take traditional narratives into the realm of simulation. The same can be said about contemporary video game theory. Whilst games with linear storylines in which the focus is placed on the development of its fixed or embedded narratives try to maintain a representational element of narrative in their design; the concept of a ludonarrative evolving during gameplay, and the concept of emergent narratives originating from the exploration of open world games, are attempts at defining the simulational character of the video game as a form of narrative.

4

CONCLUSION: THE FUTURE OF INTERACTIVE AND IMMERSIVE 360-DEGREE LIVE ACTION FOOTAGE AND THE FUSION OF THE FILM AND THE VIDEO GAME

Placing these findings in the context of today's emerging participatory culture, it becomes clear that, at least temporarily, simulation is triumphing over representation. Not only computational media such as the video game and its resulting forms of produsage are primarily reliant on a simulational element, also outside of the realm of software, popular cultural goods are based increasingly around simulation rather than representation. An example of this trend is the popularity of table top roleplaying games such as *Dungeons & Dragons* or *World of Darkness*.⁶⁷ Yet another example is the 'promenade theatre', a new type of theatrical play that emerged over recent years in the UK. Here, the audience is encouraged to interact with the actors and with each other, moving around as if they were inhabitants of the venue.⁶⁸ Simulation has become an important aspect of everyday life, both online and offline. The closer a medium gets to allowing the user a believable immersive simulation of a scenario, the closer it gets to satisfying the interactive audience of the modern day. As the pleasure the public gains from simulational narratives manifests itself in an increasing number of ways, it becomes clear that media based solely on representational narratives are slowly losing momentum. One could argue that what we are experiencing in contemporary culture is the transition of 'second order simulacra' to 'third order simulacra' as Baudrillard describes in *Simulation and Simulacra*. Baudrillard distinguishes between three orders of simulacra. The first order, in which reality is represented in the way a map may represent a territory, is harmless and natural. However, the second order of simulacra,

⁶⁷ Bergström, K. (2013) "Creativity Rules: How rules impact player creativity in three tabletop". In: Harviainen, J. (Ed.) (2013) *International Journal of Role-playing*. Issue 3. pp. 4-17

⁶⁸ Adams, K. R. (2010) *Contemporary Theatre and the Experiential*. Available online at: http://usir.salford.ac.uk/11450/3/Contemporary_Theatre_and_the_Experiential_final_version.pdf [Accessed: 24th August 2014].

Baudrillard argues, is where the distinction between reality and representation starts to blur. A mass media system of production commodifies and imitates reality and the representation of reality is no longer truthful. Baudrillard gives the example of Copolla's *Apocalypse Now*, in which a reality, the Vietnam War, is although represented, represented very loosely in regards to historical accuracy.⁶⁹ The third order of simulacra is when simulation replaces representation and the simulacra no longer have an origin in reality. In this last order, all reality is replaced by what Baudrillard calls the 'hyper-real'. In conclusion to these findings, he states:

*"Without a doubt, the most difficult thing today, in the complex universe of science fiction, is to unravel what still complies (and a large part still does) with the imaginary of the second order, of the productive/projective order, and what already comes from this vagueness of the imaginary, of this uncertainty proper to the third order of simulation. Thus one can clearly mark the difference between the mechanical robot machines, characteristic of the second order, and the cybernetic machines, computers, etc., that in their governing principle, depend on the third order."*⁷⁰

Following Baudrillard, one could therefore argue that today, in the age of digital media and the video game, we have transitioned almost entirely to the third order, to the hyper-real. However, whilst in the video game almost every element is a simulation and not to be found in reality in the first place, film maintains a connection to reality by employing live action footage. Film, although often blurred for the sake of mythology and sensationalism, represents bits of reality and is still concerned primarily with the production of second order simulacra therewith. Based on this reflection one could argue that film's realism is an element of cultural production that is critical in maintaining glimpses of reality in our increasingly simulation-driven hyper-real world. Video games cannot

⁶⁹ Baudrillard, J. (1981) *Simulation and Simulacra*. Ann Arbor, Michigan: University of Michigan Press. pp. 59-61

⁷⁰ Ibid. pp. 121-129

replace the capture and reproduction of real life events in the form of documentaries, news reports or other factual formats. Even in regards to fiction, the realism of the facial expressions and motions of skilled actors and actresses in live action films achieve a level of emotional impact that the computer-generated images of video games seldom achieve. The video game also rarely induces ideological reflections to the same extent as the film. This is due to the long-standing history of representational narratives and storytelling techniques in theatre, literature and other arts that have influenced storytelling in cinema. Whilst the video game and the concept of a simulational first person narrative is still in its early days, and game developers are still more concerned with the mastery of the employed technologies, representational narratives have been used for ideological purposes and have been perfected over the entire past century, not only in film but also in other previous forms of cultural production.

However, there are many other elements to this very simulational aspect of the video game that are more appealing than the medium of film, regardless of the accompanying dangers Baudrillard has noted. A game's simulational character grants the participant an insight into how reality is constituted that representation does not. One could therefore just as well argue that the simulation of events is an improvement over their mere representation, given that the distinction between reality and simulacra is clearly identifiable. As a narrative device it makes events transparent and educative in the sense that they are endlessly explorable and replay-able. Most represented events in turn remain opaque. They only show one of many options or paths that a particular moment of a fictional event could have taken. Whether or not the viewer is willing to perceive a film as an educative medium depends primarily on the viewer's identification with the filmmaker's skewed personal views. In the case of the video game, however, the narrative content is not based on identification but on actual simulated experience, taking on the form of a subjective real life occurrence, albeit simulated. It can be re-enacted with different choices made and can teach us what consequences result from each choice, at least within hyper-reality. This is ultimately the benefit of the video game over film in contemporary culture as a device of cultural communication and education. On

top of this, as participatory culture theorists such as Lévy and Jenkins have pointed out, interactivity and participation in media are important elements in the creation of a more active and democratic spirit amongst the public. In addition, whilst it is true that video game designers may put cinematic narrative techniques to use in cut-scenes and in other representational content their video games may feature, the ideological powers of simulational narratives must not be underestimated either. As technological mastery becomes less of a concern, game designers and developers are now able to start focusing more on ideological elements, similar to the way in which film directors and producers have done as filmmaking technology became increasingly easier to use throughout history. The options given to the player through the specific design of a virtual world allow for the emergence of only certain narratives during gameplay. In an emergent game like the Sims for example, a narrative reminiscent of a romantic comedy film might emerge, yet a narrative reminiscent of an action or horror flick is very unlikely to develop. This is simply due to the specificities of the possibility space the video game offers, the characters it allows to create, the items it allows these characters to pick up and use, or the type of relationships it allows them to have. All of these elements of the gameplay are passively guiding emergent storylines as they develop. This power of guidance is ultimately in the hands of the developers and designers. They set the boundaries, which allow for certain ideologies to surge from gameplay and prevent others from doing so.

For all of these reasons, both the realism of live action film and the simulational qualities of the video game are important elements of cultural production that complement each other and must not stand in competition to one another. Instead, fused together into one single narrative art form, they could give rise to a well-balanced combination between the capture and maintenance of aspects of reality in media and a participatory and interactively engaging simulation. The fusion of the two forms is foreseeable. Both technological advances such as the 360-degree camera, which allows film to enter the realm of spatial immersion known from video games, as well as filmmaking trends such as the increase of subjective POV shots, which also borrow from this medium's obsession with the

first person perspective, are indicators of the influence the gaming industry has had on the film industry. Equally, the 3D animation of James Cameron's film *Avatar*, which became the highest grossing film of all time at the box office,⁷¹ and the VFX techniques the company Framestore used in their Galaxy Chocolate advert starring a very accurate digital recreation of Audrey Hepburn as main protagonist,⁷² are only some of the recent successes in which computer generated imagery from video games were put to use in the medium of film. However, also within the games industry the practices of film production are increasingly gaining importance. Not only the cinematography and narrative storytelling methods of film are put to use increasingly in games such as Rockstar's *L.A. Noire*, which was based on the film noir cinema genre of the 1940s and 1950s,⁷³ or Naughty Dog's *The Last of Us*, a game officially inspired by a BBC documentary, several Coen Brothers films and the zombie-horror AMC series *The Walking Dead*;⁷⁴ also practices of film production are finding a place in video game production. The use of film and TV actors as motion actors for cut-scenes, such as Kevin Spacey's role in the latest *Call of Duty: Advanced Warfare* video game, is an example of this fusion.⁷⁵ The film industry and the video game industry are converging in regards to the technologies employed, the crew roles required and the way business is done. As a natural result of this, the advantages of both media are starting to combine as well, slowly forming a superior narrative art form.

⁷¹ BBC (2010) *Avatar overtakes Titanic as top-grossing film ever*. Available online at: <http://news.bbc.co.uk/1/hi/8482058.stm> [Accessed: 24th August 2014].

⁷² Framestore (2013) *Galaxy/Dove 'Chauffeur'* (TV Advert). Available online at: <http://www.framestore.com/work/galaxy-choose-silk-chauffeur> [Accessed: 24th August 2014].

⁷³ Rockstar Games (2011) *Rockstar Recommends: Chinatown*. Available online at: <http://www.rockstargames.com/newswire/article/13771/rockstar-recommends-chinatown.html> [Accessed: 24th August 2014].

⁷⁴ Game Informer (2012) *Strife Breeds Strife: Inspiration For The Last Of Us*. Available online at: http://www.gameinformer.com/games/the_last_of_us/b/ps3/archive/2012/02/10/strife-breeds-strife-inspiration-for-the-last-of-us.aspx [Accessed: 24th August 2014].

⁷⁵ BBC (2014) *Kevin Spacey to star in Call of Duty game*. Available online at: <http://www.bbc.co.uk/newsbeat/27252433> [Accessed: 24th August 2014].

Where one draws the line between the video game and the film (and how one defines this new emerging art form) depends ultimately on which one of their characteristics one identifies as defining and conceptually essential. When we look at film and games with Baudrillard's concept of the hyper-real in mind, then the current function of the video game is to allow simulation of narrative content and generate simulacra from the hyper-reality of software, whilst the function of film is to allow representation of narrative content, generating simulacra from elements of reality. One could therefore argue that what distinguishes film is its live action character, the reality of the facial expressions and motions of its actors, its link with historical events or its ability to document bits of reality. If the difference between film and games is drawn based on this, then a fusion between the simulational ludic structure of a video game and the live action footage of film would lead to the characterisation of this potential art form as a simulational movie, a ludic movie or ludomovie. It would still be classed as a film due to its realism and use of live action, but its ludic aspects would have to be considered as an innovation on its traditional form. One could, however, also define film for its traditionally contemplative, non-interactive and observational nature, and the video game for its engaging and interactive nature. Defining the concepts of the film and the video game based on their potential for interactivity, however, would render the term 'interactive film' entirely contradictory. In this sense, the integration of live action to the video game would mainly constitute a more realistic and technologically unconstrained innovation on the interactive full motion video games that characterised the 1990s, such as ALG's *Crime Patrol* or Chris Robert's *Wing Commander III*.

Although film in the present day is still solely a representational medium due to technological limitations and the spatial exploration possible in live action footage is still very limited, the fusion of the film and the video game is foreseeable as live action footage becomes more navigable. It is clear that the future of film lies within the interactive ludic structure of the video game and not outside of it. Equally the success of recent video games has been more and more dependent on the integration of enticing cinematography and highly developed narratives reminiscent of cinema. This means that ignorance towards the

demand for the spatially immersive capabilities of the video game is as detrimental to successful film production as a dismissal of cinematography, cinematic narrative and the realism of the motions and expressions of actors is for the creation of successful video games. Neither the rejection of first person involvement in film, as Ben Shaul supports, nor the replacement of all narrative with database, as Lev Manovich proposes, should therefore be considered as viable options for the future of interactive film in the long term. Instead, a balanced compromise between these two radical strands of thought must be found; an agreement between the inspiring and thrilling possibilities of simulation and the truthful realism of representation must be reached.

BIBLIOGRAPHY:

Adams, K. R. (2010) *Contemporary Theatre and the Experiential*. Available online at:

http://usir.salford.ac.uk/11450/3/Contemporary_Theatre_and_the_Experiential_final_version.pdf [Accessed: 24th August 2014].

Barbican (2014) *Digital Revolution: An immersive exhibition of art, design, film, music and videogames (Press Release)*. Available online at:

<http://www.barbican.org.uk/bie/upcoming-digital-revolution> [Accessed: 17th August 2014].

Baudrillard, J. (1981) *Simulation and Simulacra*. Ann Arbor, Michigan: University of Michigan Press.

BBC (2010) *Avatar overtakes Titanic as top-grossing film ever*. Available online at:

<http://news.bbc.co.uk/1/hi/8482058.stm> [Accessed: 24th August 2014].

BBC (2014) *Kevin Spacey to star in Call of Duty game*. Available online at:

<http://www.bbc.co.uk/newsbeat/27252433> [Accessed: 24th August 2014].

Beaumont-Thomas, B. (2014) "Film streaming and downloads to overtake box office in 2017". In: *The Guardian*. June 4th. Available online at:

<http://www.theguardian.com/film/2014/jun/04/film-streaming-downloads-dvd-netflix> [Accessed: 14th August 2014].

Bergström, K. (2013) "Creativity Rules: How rules impact player creativity in three tabletop". In: Harviainen, J. (Ed.) (2013) *International Journal of Role-playing*. Issue 3.

Ben Shaul, N. (2008) *Hyper Narrative Interactive Cinema: Problems and Solutions*. Amsterdam, Netherlands: Rodopi.

Bruns, A. (2007) *Prodosage: Towards a Broader Framework for User-Led Content Creation*. Available online at:

[http://snurb.info/files/Prodosage%20\(Creativity%20and%20Cognition%202007\).pdf](http://snurb.info/files/Prodosage%20(Creativity%20and%20Cognition%202007).pdf) [Accessed: 14th August 2014].

Bruns, A. (2008) *Blogs, Wikipedia, Second Life, and Beyond: From Production to Prodosage*. New York, NY: Peter Lang.

Bubl; Skydiving Toronto. (2013) *See bubl In the Sky with Skydiving Toronto* [Online Video]. Available online at: <http://www.bublcam.com/portfolio/see-bubl-in-the-sky-with-skydiving-toronto/> [Accessed: 17th August 2014].

Bubl; Popular Mechanics (2013) *Bubl Bike Tour of Popular Mechanics Office*. [Online Video]. Available online at: <http://www.bublcam.com/portfolio/popularmechanics/> [Accessed: 17th August 2014].

Cousteau, F.; 360Heroes. (2014) *Deep Dive* [Online Video]. Available online at: <http://time.com/cousteau/> [Accessed: 17th August 2014].

C.E.D.R.I.C/CNAM: Chauvin, S.; Donnart, J.Y; Levieux, G. and Natkin, S. (2014) “*An Out-of-Character Approach to Emergent Game Narratives*” Available online at: http://fdg2014.org/papers/fdg2014_wip_05.pdf [Accessed: 18th August 2014].

Crowther, B. (1947) “Dark Passage, Warner Thriller, in Which Humphrey Bogart and Lauren Bacall Are Chief Attractions, Opens at Strand” In: *New York Times*. *September 6th*. Available online at: http://www.nytimes.com/movie/review?_r=1&res=9901E6DA153AE233A25755C0A96F9C946693D6CF [Accessed: 17th August 2014].

Davison, P. (2012) “The Language of Internet Memes” In: Mandiberg, M. (Ed.) (2012) *The Social Media Reader*. New York, NY: New York University Press.

DFC Intelligence (2014) *DFC Intelligence Forecasts Global Video Game Industry to Reach \$96B in 2018*. Available online at: <http://www.dfcint.com/wp/?p=358> [Accessed: 14th August 2014].

Framestore (2013) *Galaxy/Dove 'Chauffeur'* (TV Advert). Available online at: <http://www.framestore.com/work/galaxy-choose-silk-chauffeur> [Accessed: 24th August 2014].

Frasca, Gonzalo. (2003). "Simulation versus Narrative." In: Wolf, Mark J. P. and Perron, Bernard. (2003). *The Video Game Theory Reader*. New York: Routledge.

Galloway, A. R. (2006) *Gaming: Essays on Algorithmic Culture*. Minneapolis, Minnesota: University of Minnesota Press.

Gamasutra (2014) *Condition One unveils first interactive trailer for upcoming Oculus Rift 3D 360-degree film "Zero Point" (Press Release)*. Available online at: <http://www.gamasutra.com/view/pressreleases/211147/> [Accessed: 17th August 2014].

Game Informer (2012) *Strife Breeds Strife: Inspiration For The Last Of Us*. Available online at: http://www.gameinformer.com/games/the_last_of_us/b/ps3/archive/2012/02/10/strife-breeds-strife-inspiration-for-the-last-of-us.aspx [Accessed: 24th August 2014].

G enette, G. (1980) *Narrative discourse: An Essay in Method*. Ithaca, NY: Cornell University Press.

Hinkson, J. (2011) *Through the Camera's Eye: Experiments with Subjective Camera in Film Noir*. Film Noir Foundation. Available online at: <http://filmnoirfoundation.org/sentinel-article/NoirCity-emag-Camera.pdf> [Accessed: 17th August 2014].

Hocking, C. (2007) *Ludonarrative Dissonance in Bioshock*. Available online at: http://clicknothing.typepad.com/click_nothing/2007/10/ludonarrative-d.html [Accessed: 18th August 2014].

Huhtamo, E. (2007) "Push the Button, Kinoautomat will do the Rest! Media-archaeological Reflections on Audience Interactivity" In: *Kinoautomat (DVD+Booklet)*. Available online at: http://gebseng.com/media_archeology/reading_materials/Erkki_Huhtamo-Kinoautomat.pdf [Accessed: 17th August 2014].

Jenkins, H. (2006) *Convergence Culture: Where Old and New Media Collide*. New York, NY: New York University Press.

Jensen, H. (1963) "The new "Circlorama" cinema in London". In: *Kino-Technik Nr.7*. Available online at: <http://www.in70mm.com/news/2004/circlorama/index.htm> [Accessed: 17th August 2014].

Hale, T. (2013) *From Jackasses to Superstars: A Case for the study of 'Let's Play'*. Available online at: <https://www.academia.edu/5260639/> [Accessed: 14th August 2014].

Katherine Hayles, N. (2005) "Narrating Bits: Encounters between Humans and Intelligent Machines" In: *Vectors: Journal of Culture and Technology in a Dynamic Vernacular, Volume 1 Issue 1 (Evidence)*.

Keen, A. (2008) *The Cult of The Amateur: How Today's Internet is Killing Our Culture*. London, UK: Nicolas Brealey Publishing.

Kinder, M. (2003) "Designing a Database Cinema" In: Shaw, J.; Weibel, P. (Ed.) (2003) *Future Cinema: The Cinematic Imaginary After Film*. Cambridge, Massachusetts: MIT Press.

Kinder, M. (2005) "Narrative Equivocations between Movies and Games" In: Harries, D. (Ed.) (2005) *The New Media Book*. London, UK: BFI Publishing.

Kolor (2014) *MWC2014: Kolor & Finwe launch Kolor Eyes for Android (free 360-degree video player)*. Available online at: <http://www.kolor.com/blog-en/2014/02/25/kolor-finwe-launch-kolor-eyes-for-android-free-360-degree-video-player-join-the-beta-program/> [Accessed: 17th August 2014].

Leadbeater, C.; Miller, P. (2004) *The Pro-Am Revolution: How enthusiasts are changing our economy and society*. London, UK: Demos. Available online at: <http://www.demos.co.uk/files/proamrevolutionfinal.pdf> [Accessed: 14th August 2014].

Lévy, P. (1997) *Collective Intelligence*. Cambridge, Massachusetts: Perseus Books.

Making View. (2013) *Red Bull Hare Scramble* [Online Video]. Available online at: <http://www.makingview.com/portfolio/red-bull-hare-scramble-2013/> [Accessed: 17th August 2014].

Making View. (2013) *Speedflying Lofoten* [Online Video]. Available online at: <http://www.makingview.com/portfolio/speedflying-lofoten-360-experience/> [Accessed: 17th August 2014].

Manovich, L. (2005) "Old Media as New Media: Cinema." In: Harries, D. (Ed.) (2005) *The New Media Book*. London, UK: BFI Publishing.

Manovich, L. (2005) *Soft Cinema: Navigating The Database* (DVD+Booklet). Cambridge, Massachusetts: MIT Press.

Mascelli, Joseph V. (1965) *The Five C's of Cinematography: Motion Picture Filming Techniques Simplified*. Hollywood, California: Cine/Grafic Publications.

Milk, C. (2011) *Three Dreams of Black*. Available online at: <http://www.ro.me> [Accessed: 17th August 2014].

Morerio, P.; Marcenaro, L.; Regazzoni, C.S. (2013) "Hand Detection in First Person Vision" In: *Information Fusion (FUSION), 2013 16th International Conference Paper*. Available online at: <http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=6641179> [Accessed: 17th August 2014].

O'Hagan, M.; Mangiron, C. (2013) *Game Localization: Translating for the global digital entertainment industry*. Amsterdam, Netherlands: John Benjamin's Publishing Company.

Piccolin, L. (2004) *All-Around Cinema: Ernst A. Heiniger's Swissorama*. Available online at: <http://www.in70mm.com/news/2004/swissorama/> [Accessed: 17th August 2014].

Pryor, Thomas M. (1947) "Lady in the Lake At the Capitol" In: *New York Times*. January 24th. Available online at: <http://www.nytimes.com/movie/review?res=9C04E3DE123EEE3BBC4C51DFB766838C659EDE> [Accessed: 17th August 2014].

PTGui, New House Internet Services B.V. (2009) *PTGui - Panorama Tools: Graphical User Interface*. Available online at: <http://www.ptgui.com/man/projections.html> [Accessed: 17th August 2014].

Prince, G. (1999) "Revisiting Narrativity". In: Bal, M. (Ed.) (2004) *Narrative Theory Vol.1: Major Issues in Narrative Theory Critical Concepts in Literary and Cultural Studies*. London, UK: Routledge.

Rehak, B. (2003) "Playing and Being: Psychoanalysis and the Avatar". In: Wolf, Mark J. P. and Perron, Bernard. (2003). *The Video Game Theory Reader*. New York, NY: Routledge.

Rheingold, H. (2008) "Using Participatory Media and Public Voice to Encourage Civic Engagement." In: Bennett, W. L. (2008) *Civic Life Online: Learning How Digital Media Can Engage Youth*. Cambridge, Massachusetts: MIT Press.

Rheingold, H. (2012) *Net Smart: How to Thrive Online*. Cambridge, Massachusetts: MIT Press.

RIAA (1973 - 2014) *RIAA Statistics*. Available online at:
<http://www.riaa.com/shipmentfaq.php> [Accessed: 14th August 2014].

Rockstar Games (2011) *Rockstar Recommends: Chinatown*. Available online at:
<http://www.rockstargames.com/newswire/article/13771/rockstar-recommends-chinatown.html> [Accessed: 24th August 2014].

Rooster Teeth YouTube Channel (2013) *Things To Do in GTAV - Race To The Top* (Online Video). Available online at:
<https://www.youtube.com/watch?v=GvCDWRpFbQ0> [Accessed: 14th August 2014].

Rooster Teeth YouTube Channel (2013) *Things To Do in GTAV – Stop that Train!* (Online Video). Available online at:
<https://www.youtube.com/watch?v=eJWWOC67m9E> [Accessed: 14th August 2014].

Rose, F. (2012) *The Art of Immersion: How the digital generation is remaking Hollywood, Madison Avenue, and the way we tell stories*. New York, NY: W. W. Norton & Company.

Shaw, J.; Weibel, P. (2003) *Future Cinema: The Cinematic Imaginary After Film*. Cambridge, Massachusetts: MIT Press.

Sontag, S. (1996) "The Decay of Cinema". In: *The New York Times*. February 25th. Available online at: <http://www.nytimes.com/1996/02/25/magazine/the-decay-of-cinema.html> [Accessed: 14th August 2014].

Srachi YouTube Channel. (2014) *Flying eagle point of view #1* [Online Video]. Available online at: <https://www.youtube.com/watch?v=G3QrhdfLC08> [Accessed: 17th August 2014].

The Gadget Show, Channel 5 (2011) *Ultimate Battlefield 3 Simulator - Build & Test*. [Online Video] Available online at: <https://www.youtube.com/watch?v=eg8Bh5iI2WY> [Accessed: 17th August 2014].

Toffler, Alvin. (1980) *The Third Wave: The Classic Study of Tomorrow*. New York, NY: Bantam.

Twitter (2014) *TV x Twitter: New findings for advertisers and networks*. Available online at: <https://blog.twitter.com/2014/tv-x-twitter-new-findings-for-advertisers-and-networks> [Accessed: 14th August 2014].

Visualize. (2014) *F1 W05360 VIDEO* [Online Video]. Available online at: <http://www.mercedesamgf1.com/en/car/f1-w05-360-video/> [Accessed: 17th August 2014].

Wadson, D. (2013) *Gamertube: Pewdiepie and the YouTube Commentary Revolution: How a new wave of YouTube stars is blurring the line between creator and fan*. Available online at: <http://www.polygon.com/features/2013/9/6/4641320/pewdiepie-youtube-commentary> [Accessed: 14th August 2014].

Weinbren, G. (1995) "Another Dip into the Ocean of Streams of Story" In: Shaw, J.; Weibel, P. (Ed.) (2003) *Future Cinema: The Cinematic Imaginary After Film*. Cambridge, Massachusetts: MIT Press.