

Thesis proposal

Research title or question

Will photorealism continue to be the leader in the film industry in the future and despite its controversy around the uncanny valley?

Draft introduction

Photorealism has been an important movement throughout the years in many different fields like painting, architecture, marketing, graphic design, and filmmaking, due to its convenience to help recreate places, objects, or characters that need to look as if they were captured through a camera lens from live action. This essay is going to analyse the uses of photorealism in filmmaking such as the addition of photorealistic digital elements to avoid dangerous live action scenes, to create imaginary or fictional scenarios impossible to shoot in live action, or as a health and safety tool when travelling to different locations is an impossible task. It will also reflect the issues that VFX artists have faced when trying to achieve a believable photorealistic look that would please all audiences, and that will not leave them stuck in the so called 'uncanny valley'. Lastly, it will also mention the new techniques and technologies that are arising to provide a more refined and seamless photorealistic result in the future of film storytelling.

Keywords searched

Photorealism, film making, uncanny valley, safety, Computer Generated Imagery, CGI, visual effects, VFX

Research design methods

This research methodology will focus on a qualitative research based on peer reviewed material searched on Google Scholar where some papers were found with detailed case studies from visual effects artists explaining their personal experience with photorealism techniques regarding the audience reaction to it and their problem with the uncanny valley. In addition, more material was found on the LCC Library, and on my personal visual effects book collection, about the technical aspects of photorealism in filmmaking and its future uses and techniques that are being currently tested and starting to be implemented in film productions.

Draft literature review

According to Studio Binder (Kench, 2022), Britannica (Wainwright, 2019), and Tate (2023) official websites, photorealism is an art movement that started on 1960s in America, that shows artworks that look photographic. These sources will contribute to explain the concept of Photorealism before diving into a more specific analysis of this movement into filmmaking.

Photorealism can be used in filmmaking in many scenarios. Maio (2021), in her article *What is VFX? Defining the Term and Creating Impossible Worlds*, reflects about how VFX industries use photorealistic digital assets to create impossible and dangerous scenes such as the scene in *The Matrix* when the main character dodges bullets shot against him.

Supporting the previous argument, Eran Dinur, visual effects supervisor, believes that Photorealism is an aspect that is important across all disciplines as it helps simulating a real character, object, environment, or phenomenon that would have been impossible, dangerous, or highly costly to be filmed or photographed in live action. Delving into Eran Dinur's bibliography, and more specifically in his book *The Complete guide to Photorealism for Visual Effects, Visualization and Games*, he analyses how to implement the physics that apply to the world around us to the visual effects in filmmaking and make them look as photorealistic as possible. Since most of the scenery in filmmaking are not even real, like alien planets, fantastic creatures, or impossible

environments for our understanding of physics, visual effects artists important job is to observe and study the world around us and try to implement it to these fictional shots. Dinur also mentions that the quality of photorealism does not depend entirely on the quality of the digital capturer and display, but also on aspects such as light and surface, sense of depth, textures, optical lenses, and many other characteristics that make a shot look photorealistic in both high and low definition.

The origins of photorealism and how it has been developing throughout the years is explained in Manovich's book, *The Language of New Media* (2002). He also analyses how it is a common opinion that CGI will never be as realistic as images gathered by camera lenses. However, he also counter argues that these opinions are mistaken, explaining how CGI is in fact becoming more realistic than traditional photographs and even becoming hyperrealist. He also mentions that photorealism is often mistaken with realism, as people has the tendency that this movement depicts the reality as we see it through our eyes, when what photorealism has always tried to achieve is the look of the reality seen through a camera lens. This mistake often leads to the so-called 'uncanny valley'.

Going back to Erin Dinur, in an interview he had with the journalist Ian Failes (2021), he defends that if a digital asset does not look like it was shot live in front of a camera and like it is part of the rest of the composition, it will look fake and will not work. This is why, in his opinion, photorealism is so important for visual effects artists and why there is also a lot of pressure on the visual effects artists' shoulders regarding the 'uncanny valley', where the audience's opinion will be stuck on feedbacks such as 'this looks fake' or 'it looks too CG'. He also explains why audience is often mistaken on what to expect about a photorealistic scene in regards of its 'realistic' look. In addition, he also affirms that it is difficult to point out which part of the CG shot needs to be improved to make it look more photoreal as there is a in the VFX companies exists a long pipeline with different job positions and it would be hard to see were the mistake or improvement needs to be taken care of.

Dinur also has a previous book, *The Filmmaker's Guide to Visual Effects: The Arts and Techniques of VFX for Directors, Producers, Editors, and Cinematographers*, where he speaks about the fact that a convincing photorealistic work is possible as soon as there is a 'respect for the real-world physics and optics'. However, it is also very easy for VFX artists to fall for the desire to use every single VFX available and overload the film with an excess of digital effects that takes off the audience from the story.

Taking in consideration the amount of work, focus, and knowledge a good photorealistic shot requires, Jeng (2023) explains in their research paper, *Sidelining Photorealism: 'Speed Racer' and Articulation of Digital Effects Labour*, how photorealism has always been the leader in the film industry and how some movies like 'Speed Racer' have opted to sideline this style to help foreground the work of digital visual effects artists. Furthermore, Agrawal and Auryn (2009), and Cooper (1999) also explain the challenges and techniques that artists have faced with photorealism (and its issues with the so called 'uncanny valley'). They also explain how some artists have opted for NPR (non-photorealistic rendering) instead, to create a simpler and cartoony style (animation) that gives more creative freedom and more room to use the artist's imagination.

On another note, nowadays, quality in photorealism has become so high and polished that it is difficult to differentiate it from real photographs or live action scenes. This could be beneficial and useful when used with good intentions, but it could also be used with malicious intentions. Meena and Tyagi (2019) argue in their paper, *A Novel Method to Distinguish Photorealistic Computer Generated Images from Photographic Images*, how photorealism, despite revolutionising the filmmake and game industry, how it has also been used with malicious intentions and how important it is to learn how to distinguish real assets from computer generated ones.

To understand photorealism practices amongst practitioners in the industry, Melki (2019), in his dissertation called *An Investigation Into The Creative Processes In Generating Believable Photorealistic Film Characters*, explains the process to create photorealistic film characters that are credible, as well as its benefits and challenges. The research also extends to interviews made with several industry expert practitioners with the purpose of comparing of all the statements acquired from the participants.

General outline of each chapter

1. Introduction
2. Literature review
3. Methodology
4. What is photorealism?
5. What are the origins of photorealism in filmmaking and what were its initial uses?
6. How is photorealism used in filmmaking nowadays and how important is it?
 - a. Importance of photorealistic VFX to replace dangerous live action scenes.
 - b. Importance of VFX to replace impossible to shoot environments and characters such as outer space scenes, fictional environments, or deceased actors.
 - c. Importance of VFX for health and safety issues like the use of virtual production when the global pandemic hit and travel to different locations was not a possibility.
 - d. Does photorealism quality depend purely on the new digital technologies' high definition?
7. Why is photorealism not accepted by all audiences?
 - a. Uncanny valley.
 - b. Has the audience become more used to photorealism, therefore, more exigent about it?
 - c. Is photorealism considered emotionless?
 - d. At what point photorealism starts to become excessive?
 - e. Non-photorealism in filmmaking to foreground the work of digital effects artists.
 - f. Photorealism costs and workload.
 - g. Photorealism used for malicious intentions, issues caused, and solutions in place to help avoid this.
8. Industry professionals case studies.
9. What could be the future of photorealism in filmmaking?
 - a. AI as a tool to help with photorealism demands in film industry. Would AI replace human labour as digital VFX has shadowed handmade VFX artists and animators' jobs?
 - b. Is virtual production helping with green screen spill issues? Is this new technique having problems when shooting outdoors or with moiré shown in screens? As background cannot be replaced, would this new technique require more planning beforehand?
 - c. Is Unreal Engine helping filmmaking industry to speed up their work process and to reach a more photorealistic look?
10. Conclusion

Draft chapter

4. What is photorealism?

According to Wainwright in her encyclopaedia Britannica description (2019), photorealism is an art movement that started on 1960s in America, that depicts artworks that look photographic as if they were seen through a camera lens. This form of art is defined by being complex, extremely clear, and emotionally neutral. This form of art was considered a threat to the minimalist and abstract movements that surged during the 1950s, looking for a more expressive and spontaneous outcome. Moreover, since photorealism was considered unoriginal and boring, this led to the so-called pop art movement which had a more cartoonish and colourful look. However, in the beginnings of 1990s, as effect of the development of digital cameras which could offer a more precise image, the interest in photorealism resurged again (Tate, 2023).

Indicative bibliography

- Agrawal, A., and Auryn (2009). *Non-photorealistic Rendering: Unleashing the Artist's Imagination* (online). Available at: <https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5167490> [Accessed 25 April 2023]
- Cooper, D. (1999). *Personal Thoughts on Non-Photorealistic Rendering* (online). Available at: <https://dl.acm.org/doi/pdf/10.1145/563666.563690> [Accessed 25 April 2023]
- Dinur, E (2017). *The Filmmaker's Guide to Visual Effects: The Arts and Techniques of VFX for Directors, Producers, Editors, and Cinematographers*. New York: Taylor & Francis.
- Dinur, E. (2022). *The Complete Guide to Photorealism for Visual Effects, Visualization and Games*. New York: Taylor & Francis.
- Failes, I. (2020). *EPIC'S GOAL WITH NEXT-GEN UNREAL ENGINE IS PHOTOREALISM* (online). Available at: <https://beforesandafters.com/2020/05/14/epics-goal-with-next-gen-unreal-engine-is-photorealism/> [Accessed 4 June 2023]
- Failes, I. (2021). *WHAT IS PHOTOREALISM? WELL, SOMEONE LITERALLY JUST WROTE THE BOOK ON IT* (online). Available at: <https://beforesandafters.com/2021/11/30/what-is-photorealism-well-someone-literally-just-wrote-the-book-on-it/> [Accessed 4 June 2023]
- Jeng, J. (2023). *Sidelineing Photorealism: 'Speed Racer' and Articulation of Digital Effects Labour* (online). Available at: https://books.google.co.uk/books?hl=en&lr=&id=KLOqEAAAQBAJ&oi=fnd&pg=PA153&dq=photorealism+in+film&ots=r8349MIY8s&sig=aEhMvSbwORZ1C0leMCKO8dnpnEns&redir_esc=y#v=onepage&q=photorealism%20in%20film&f=false [Accessed 25 April 2023]
- Kench, S. (2022). *What is Photorealism – The Art of the Real Explained* (online). Available at: <https://www.studiobinder.com/blog/what-is-photorealism-definition/> [Accessed 23 April 2023]
- Maio, A. (2021). *What is VFX? Defining the Term and Creating Impossible Worlds* (online). Available at: <https://www.studiobinder.com/blog/what-is-vfx/> [Accessed 30 May 2023]
- Manovich, Lev (2002). *The Language of New Media*. First paperback edn. Cambridge: The MIT Press.
- Meena, K. B., and Tyagi, V. (2019). *A Novel Method to Distinguish Photorealistic Computer Generated Images from Photographic Images* (online). Available at: <https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8985711> [Accessed 25 April 2023]
- Melki, H. (2019). *An Investigation Into The Creative Processes In Generating Believable Photorealistic Film Characters* (online). Available at: https://pure.ulster.ac.uk/ws/portalfiles/portal/78290411/Henry_Melki_Thesis.pdf [Accessed 25 April 2023]
- Tate (2023). *Photorealism* (online). Available at: <https://www.tate.org.uk/art/art-terms/p/photorealism> [Accessed 30 May 2023]
- Wadmare, S. (2021). *Recent Trends Visitation in VFX and SFX in the Animation World* (online). Available at: <http://ilkogretim-online.org/fulltext/218-1617213160.pdf?1682423818> [Accessed 25 April 2023]
- Wainwright, L. S. (2019). *Photo-realism*. *Encyclopedia Britannica* (online). Available at: <https://www.britannica.com/art/Photo-realism> [Accessed 30 May 2023]

(Word count: 1696)