

Thesis Proposal_Moonju Youn

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Submission date: 03-Jul-2024 07:13PM (UTC+0100)

Submission ID: 237131464

File name: 921369_Moonju_Youn_Thesis_Proposal_Moonju_Youn_1143696_695111034.docx (32.71K)

Word count: 1799

Character count: 10492

Thesis Proposal

Research title or question

How Do Visual Effects with Photorealism and Anamorphosis Enhance Immersive Experiences?

Draft Introduction

Modern film production relies heavily on visual effects (VFX) to achieve more convincing visuals. There are various factors that contribute to creating realistic and persuasive visuals that make audiences feel they are a natural part of the video, such as camera techniques, lighting, and environmental settings. To create persuasive depictions for audiences, photorealism has become a key concept in VFX. In order to achieve more precise and realistic results, as if captured through an actual camera, various techniques are constantly evolving. Techniques and principles that help VFX look photorealistic will be discussed.

This flow of evolution has led to various approaches to enhance the immersive audience experience like 3D movies; however, these are limited because they cannot be shown without specific tools. The advent of curved screens and anamorphic screen art showcased the possibility of overcoming these limitations using optical illusions with anamorphic techniques. This research derived from the potential of anamorphosis to complement photorealism. Combined with anamorphic screen art, which uses optical illusions and perspective techniques to change images based on the viewer's viewpoint, the result can be a deeply immersive experience. This approach has widened the opportunities for VFX applications, not only in films but also in realms like advertising.

Research related to the adaptation of the anamorphosis technique to VFX is currently insufficient. Yassin (2023), in her article ¹⁴ *Anamorphic Illusion Technology and its Creative Applications in Digital out Door Advertising*, provides the fundamentals of the anamorphosis technique and analyzes various anamorphic screen arts. However, it doesn't include the technical methods in terms of VFX. Accordingly, in this study, I aim to produce a video using VFX tools in a practical environment and explore the technical aspects in depth.

When it comes to anamorphic screen art, camera angles and perspectives play a significant role.

In this study, camera angles and perspective will be explored as means of enhancing immersive experiences through a combination of photorealism and optical illusionary techniques. By experimenting with VFX tools such as Unreal Engine and Houdini, this research identifies an answer to the research question; How do visual effects with photorealism and anamorphosis enhance immersive experiences? By creating anamorphic screen art as a case study, this research aims to explore both the academic and technical approaches. The focus will be on the effectiveness in aspect of engaging and persuading audiences through this method.

Keywords

Photorealism, Anamorphic Screen Art, Immersive Experience, Visual Effects, Audience Engagement

Draft Literature review

Visual effects (VFX) have become ²an essential component of the modern filmmaking industry. They enable directors to create fantastical worlds and recreate real-world scenes by bridging the gap between imagination and what the camera captures. This development has widened the possibilities of storytelling, evolving from practical effects to contemporary cutting-edge technologies. These effects not only convey spectacular visuals but also provide emotional impact by supporting storytelling (Mandapuram, 2022).

According to Joon's review (2010), photorealism is defined as the idea of reproducing a scene as realistically as possible in computer-generated imagery. He emphasizes that this contributes to enhancing storytelling and the relationship built within the scene. Principles of photorealism such as specular, scratches, and material depth, which help VFX artists achieve photorealistic

rendering were also provided in the study. One of the factors mentioned in the study is depth of field (DOF), which is defined as the distance between the object and the camera affecting focus. This can be a crucial part of the camera technique as it helps visualize objects and surroundings.

Supporting his idea, Dinur (2023) considers photorealism as a vital part of VFX because they are continuously being judged how realistic they look as a part of film. All images captured by a camera are photorealistic by themselves; however, VFX must match them to be realistic. He also emphasizes the application of a judicious approach with respect to physics and optics from the real-world.

To achieve an immersive experience, several factors should be considered. Jones (2023) discusses the varied use of VFX in films and shows how digital effects can enhance realism and create fantastical views. He states that however convincing the VFX looks, visuals from non-physical realms like dinosaurs might reduce their realism.

On the contrary to this, Budianto et al. (2022) contend that even if they do not exist in the real-world, hyperrealistic effects enable audiences to consider they are real by presenting unrealistic elements naturally in the film. They emphasize hyperrealistic elements as tools for supporting audiences' immersion in the film.

According to Bennett and Murphy (2020), drawing audiences' attention through camera angles and post-production edits is not effective when viewers are not forced into a single point. They highlight the challenge of enhancing the immersive experience, particularly in flat media like film and TV.

Using anamorphosis, shapes are represented on surfaces by a projected image that is recognizable only from a predetermined point; when seen from other perspectives, it appears

deformed. This optical perspective can be applied to various methods such as advertising, industrial design, and urban planning (Paola et al, 2015). Moreover, they mention the application of this optical technique to digital representation as a tool to enhance storytelling and audience experience.

This technique has evolved from a traditional linear perspective. What differentiates the anamorphosis technique from other camera techniques is that artists can force the perspective of the viewer (Joseph, 2021). It offers a way to enhance the immersive experience for audiences by creating more dynamic and engaging visual narratives.

As an approach to film, the format's frames play a key role in determining anamorphic composition (Deutelbaum, 2003). As elements in the screen constantly change, dividing the frame into quarters creates a grid that provides uniformity to each shot. Yassin (2023) states that the adaptation to a 3D digital billboard provides a vivid feeling and realistic visual experience to audiences. Principles for building up anamorphic screen art are also discussed with the analysis of various examples. She said that this approach offers immersive visuals drawing more attention and higher engagement.

A draft chapter

Chapter 1. Introduction

Chapter 2. Literature Review

Chapter 3. Methodology

Chapter 4-1. How can photorealism be achieved in anamorphic screen art using current VFX technologies?

Chapter 4-2. Case study – analysis of anamorphic screen art

Chapter 4-3. Case study – experiment with visual effects tools

Chapter 5. Discussion

Chapter 6. Conclusions

References

General outline of each chapter

Chapter 4-1: How can photorealism be achieved in anamorphic screen art using current VFX technologies?

This chapter defines photorealism in the historical context of art and its significance in VFX. Additionally, I explore anamorphosis in terms of its definition, history, and principles. These researches will be developed based on materials search on Google Scholar where papers and articles were found with detailed case studies from various aspects of VFX and anamorphosis. The books in the LCC library and online also will be a part of the research methods.

This part is fundamental to establishing definitions and relationships between the two main subjects before analyzing real-world applications. At the end of this chapter, I identify how optical illusionary technique can be adapted to VFX and its accompanying impact on enhancing the immersive experience for audiences.

Chapter 4-2: Case study – analysis of anamorphic screen art

In the second chapter, I will analyze anamorphic screen art based on videos. Given that this approach is closer to advertising rather than filmmaking, resources will mainly come from YouTube. Through examples, the factors that make it photorealistic and enhance audience experience will be explored as part of quantitative research. Visiting real anamorphic screens such as the one located in Piccadilly Circus will be included as part of the primary research. Experiencing the real screen and observing it from different positions, will help me understand the importance of point of view. This part will establish the core concepts that contribute to creating an immersive experience, which will be applied in the next chapter.

Chapter 4-3: Case study – experiment with visual effects tools

This case study will be directly related to my final major project (FMP) to experiment with the factors researched in previous chapters. It will work as qualitative and primary research. By working with VFX tools such as Unreal Engine and Houdini, this case study aims to achieve photorealistic visuals on screen using optical illusionary techniques. To accomplish appropriate results, various attempts will be conducted, especially with camera angles. The method for creating the anamorphic effect will be Unreal Engine and creating photorealistic visuals will be done with Houdini. In case it is impossible to integrate these methods, Cinema 4D or Maya can be alternatives. Thus, this chapter will provide the technical process to produce anamorphic screen art, from camera settings to rendering. With the finalized video, it will demonstrate the effectiveness of these techniques in engaging and persuading audiences.

Chapter 5: Discussion

In this chapter, I will discuss the results from the case studies in previous chapters. Through the results of this study, I will suggest potential questions that can be explored later. The use of research and significance will be stated along with the limitations.

Indicative bibliography

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- ¹³ Deutelbaum, M., 2003. Basic principles of anamorphic composition. *Film History*, 15(1), pp.72-80.
- ⁴ Yassin, A.K., 2023. Anamorphic Illusion Technology and its Creative Applications in Digital out Door Advertising. *International Design Journal*, 13(2), pp.21-30.

Potential resources

- ¹¹ Lash, M.I., Lord, R. and Meisel, L.K. (2014) *Photorealism: Beginnings to Today: The Sydney and Walda Besthoff Collection*. Scala Arts Publishers Incorporated.
- ¹⁰ Dinur, E. (2021) *The Complete Guide to Photorealism for Visual Effects, Visualization and Games*. Routledge.
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