

The Analysis of Surreal Space's Expression in Science Fiction Films: A Case Study of Interstellar

Yichen Wang

Qingdao No.2 Middle School, Qingdao, Shandong 266000, China

Abstract

This research analyzes surreal space expression in science fiction films, using Interstellar as a case study. The study aims to identify the expression forms and visual effects of surreal space in science fiction films and to summarize the underlying scientific principles, aesthetic principles, and audience psychological interaction. The findings of this research will contribute to the improvement and industrial development of science fiction film scene design. By proposing instructions that combine scientific theories and physical space design, the study aims to address the issues of immature theories of surreal spatial constructions in science fiction films. The guidance provided will help enhance the quality of science fiction film productions.

Keywords

Interstellar, science fiction films, surreal space, visual effects, scientific principles, aesthetic principles, visual communication, design standards, and industrialization.

1. Introduction

The expression of surreal space in science fiction films is often limited by the current level of scientific and technological advancements, as well as traditional architectural methods, making it challenging to realize in real-world architecture. However, surreal Utopian architectural concepts, liberated from the constraints of real-world technological conditions in film productions, can utilize logical scientific reasoning and leverage the construction of film scenes to illustrate advanced theoretical physical models and Utopian spatial designs for visual presentation. In the era of rapid development in virtual reality technology and scientific advancements, the science fiction industry has gained increasing popularity. In 2019, the total revenue of China's science fiction industry reached 65.871 billion yuan, showing a steady and positive development trend projected to reach 87.75 billion yuan by 2022. According to Chinese film reports, the movie "The Wandering Earth 2" concluded its theatrical run on May 15th this year, accumulating a total box office revenue of 4.029 billion yuan and attracting a total audience of 79.323 million, ranking it tenth in the history of Chinese box office records. With the rapid development of the science fiction film technology industry, people's expectations for visual effects have continuously increased. Surreal scenes in science fiction works achieve electronic immortality, free from the constraints of real-world scientific theories. Therefore, constructing surreal scenes in virtual environments requires more rigorous theoretical support. This study aims to provide a logical framework for the expression of surreal space in science fiction films and to establish a comparative reference system through the analysis of a series of similar film productions and spatial scenes. The results of this study will provide more scientifically sound and visually stunning surreal scenes for future science fiction productions. The objective of this study is to analyze the expression, visual effects, and underlying scientific, aesthetic, and visual communication principles of virtual and unbuilt architecture in science fiction films.

The article made use of qualitative analysis, interdisciplinary research, descriptive research, literature research to reach the research goal.

2. Literature Review

2.1. Overview of science fiction films and the technologies used in the portrayal of surreal space

Most science fiction films focus on interstellar explorations, future worlds, time traveling, mutation, artificial intelligence, and supernatural abilities. For instance, *Interstellar* is based on the whole universe, depicting humans' adventure in unknown space; *Total Recall* and *Inception* show the protagonists in the time tunnel fantasy adventure, exploring time, fate, and the meaning of life.

The reality shooting of virtual films uses advanced digital technology, miniaturized models, LED large screens, etc., to make virtual scenes and characters real. The combination of the real environment and actors in the filmmaking method enhances the sense of realism and immersion of the film. The realistic shooting of virtual film mainly includes the following steps. Visual preview, texture, and mapping, shooting, lighting and rendering, post-production

2.2. Analysis of previous studies on surreal space expression in films

In *Time and Space in Film -- Interpreting Time Slice and Surreal Space Design*, the author points out that surreal space design refers to the space presentation that transcends or deviates from the conventional cognitive and experiential categories. This space aims to disrupt the viewer's everyday perception of space, challenging traditional perspectives, proportions, and spatial relationships to create a distinctive cinematic experience. The core characteristics of surrealistic space are its nonlinearity, discontinuity, and multiple levels. This means that in such a space, time and place can suddenly shift, forms can be distorted, and even objects and people can take on unusual proportions or structures. Another significant point of the surreal space is its rich symbolic and metaphorical meanings. Unlike concrete Spaces that exist, surreal Spaces are often used to express abstract concepts, emotions, or philosophies. For example, a distorted cityscape or floating objects may represent the protagonist's mental states, memories, or dreams. This kind of space is often designed with a strong visual impact, the purpose is to arouse a strong reaction of the audience, so that they are further immersed in the context of the film. The existence of this kind of space not only enhances the artistic value of the film but also enriches the visual language of the film, providing the audience with a new and extraordinary aesthetic experience.

3. Analysis of Surreal Space Expression in *Interstellar*

3.1. The space design elements

In the film, Nolan divides the space scene design into two levels, one is the cosmic space and the other is the real space. The construction of the two Spaces is parallel to each other and influences each other. "Love" and "Rescue" become the bridge connecting the two Spaces, and the use of elements in each space scene cleverly makes the connection between different space-time environments inevitable.

3.1.1. The Space

In space, wormholes, black holes, and five-dimensional space are three space elements in the stage of science fantasy, which are the main body of space scene design in the film. The wormhole, a huge, constantly rotating crystal, looks bright and beautiful, and the luminaries lurking around it make this unknown world full of mystery. In the design of *Interstellar*, a wormhole is a tunnel connecting different times and space, and through this path reaches

another space environment. Nolan uses the most direct concept that 1 hour is equal to 7 years on Earth, hundreds of meters of high waves, frozen clouds, and a series of images to express the visual wonders of this unknown world. To convince the audience to understand the sense of time and space belonging to this galaxy. The black hole and the image of five-dimensional space in the film are the climax of the film. When Cooper flies his spaceship into the Kaguntua black hole, the entire space design is distorted. The great gravity caused the ship to spin out of control, which seemed to foretell the inevitable death. But Cooper is ejected from the ship and magically falls into a five-dimensional space-time. Here, time takes physical form, and they represent the state of Cooper's daughter Murphy's room at different points in time. In this space and time, the father "met" his daughter again, and it was also in this space scene design that the cosmic space and the real space were connected. The connection point is a huge bookshelf in Murphy's room, behind which the five-dimensional space appears to be hidden, and this image becomes a classic design element in the film. It is also in this space that Cooper communicates with his daughter through Morse Code and ultimately realizes the film's ultimate theme of saving humanity. Nolan is a craftsman who respects traditional techniques in the film industry, which does not limit his endless exploration and imagination of the story. The five-dimensional space is built and shot based on real scenes, which enhances the authenticity of space design.

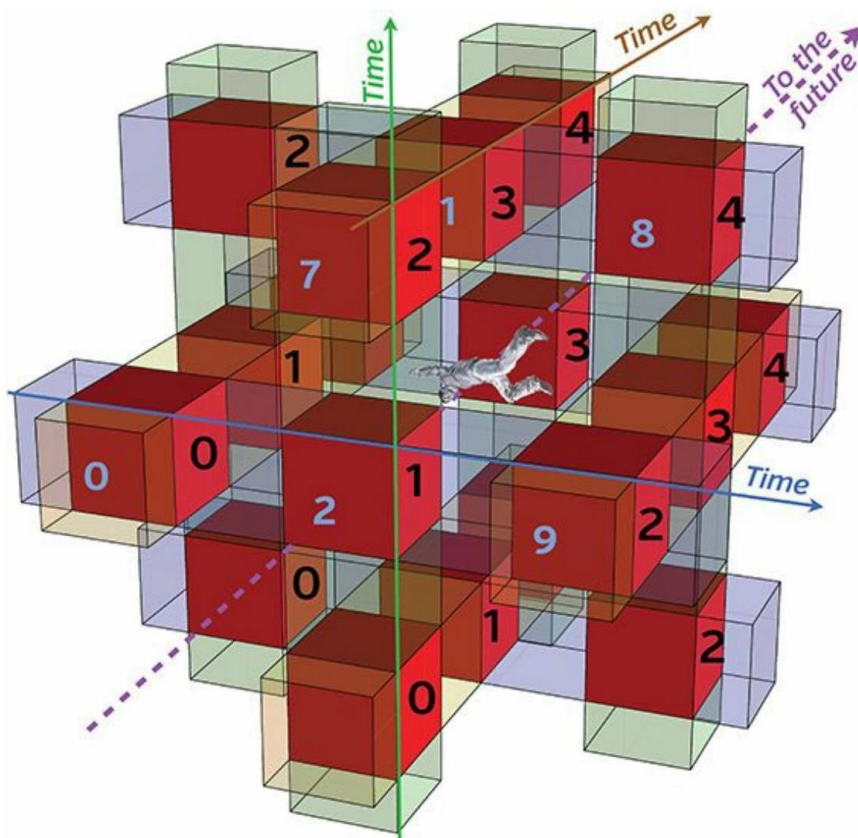


Fig. 29.13. A portion of the lattice of bedrooms created by the intersections of the moving cross sections (the extrusions). The blue numbers identify specific bedrooms

The 5D space illustration

3.1.2. The Real Space

Although the realistic space design in the film is not the main body of the plot construction, it plays a positive role in promoting the emergence and development of cosmic space design elements. For example, the house built next to the cornfield at the beginning of the film is the key place to connect with the five dimensions, and this scene is repeated on the Saturn space Station after the completion of the human rescue. Deepen the audience's impression and understanding of the five-dimensional space design. At the same time, the phenomenon of

yellow sand in real space, the death and extinction of crops one after another, and the deterioration of the global environment also provide the possibility of saving mankind and discovering the plot development of new space. Give the space change a most reasonable interpretation

3.2. Identification of scientific principles conveyed in surreal space expression

The main physics theories involved in interstellar travel are wormholes, black holes, relativity, and the Ultimate Theory.

3.3. Identification of aesthetic principles employed in surreal space design

According to Zhang Shuangnan from the Chinese Academy of Science, *Interstellar* demonstrates four important spirits: Love, Humanity's future, and Science. First, the love between Cooper and Murphy is touching. The father tried his best to return to the earth to see his daughter again. Moreover, Cooper loved Brand, so at the last second, he pushed Brand away. Second, Humans can't be stuck on the Earth forever. If they want to save people, they need to make a transplanetary journey. It was a very difficult thing to do and the basic note was bound to fail, but they did it without hesitation. This kind of courage to save humans is touching. In science fiction movies, the theme of science is essential. In this film, is to go to the center of the black hole to obtain quantum data, explore the final unification of gravity and quantum theory, and manipulate gravity, to achieve the great transfer of human beings. This is the scientific feeling that runs through the film. The film not only solves the mismatch between gravity and quantum mechanics, which is difficult to solve in physics but also solves the future fate of mankind.

Through these four feelings, the aesthetic creation principle of *Interstellar* is reviewed. This is mainly reflected in the agreement made by Professor Thorne, the scientific adviser to the film, and the director: nothing in the film will violate the established laws of physics and knowledge of the universe, to ensure the scientific rigor of the film. So *Interstellar* is a hard science fiction film, and that's why it's been around for so long. At the same time, there are still many things we do not know about the universe and physical laws, which can be speculated and played (but the physical laws and cosmic speculation that have not been understood must come from real science), leaving reasonable space for artistic creation. This is the basic principle of the movie "*Interstellar*" aesthetic creation.

3.4. Surreal space and audience psychological interaction

The application of surreal space in the film transcends the traditional visual narration and enters the audience's heart, producing a unique interaction effect with it. First of all, this kind of space design breaks the audience's daily cognitive habits and makes them experience a different aesthetic experience, thus stimulating their deeper resonance with the movie situation. When viewers are confronted with surreal scenes and structures, their brains try to find logic and meaning in them, and this process is the interaction between psychology and the film's content. Secondly, the surreal space often carries symbolic and metaphorical connotations, and these deep artistic messages need to be interpreted by the audience through psychological analysis. For example, a large city floating in the air may represent the protagonist's isolation and anxiety. While decoding this symbol, viewers may recall their own experiences and have emotional resonance. Such a design strategy enhances the emotional depth of the film and makes it a spiritual exploration. Finally, the surreal space design can stimulate the audience's curiosity and desire to explore. In the face of scenes that do not conform to the logic of reality, the audience will be attracted to explore and understand, and this curiosity further enhances the audience's investment in the film. At the same time, this design approach provides audiences with an imaginative platform, encouraging them to think outside the box and creatively interact with the surreal Spaces in the film.

4. Conclusion

As the technology develops, there are more and more great sci-fi movies. By using MR, artificial intelligence, and other technologies, we can create better movies. Through the re-interpretation and innovative design of time and space, the film can escape the shackles of traditional narrative structure and provide the audience with a richer and more shocking visual experience. This also brings a broader aesthetic space and spiritual enjoyment to the global audience. As an important part of modern culture, film's innovative exploration of time and space will undoubtedly continue to promote the prosperity and development of film art.

References

- [1] Xu L, (2015), The physics and cosmology of Interstellar, Hot comment, 2015.1:20-21
- [2] Xiao Z, (2024), Time and space in film -- Interpreting time slice and surreal space design, Media forum, 2024.5.9: 68-69
- [3] Li Q, Crossover between virtual and real -- real filming and virtual filming of science fiction films, Advanced Motion Picture Technology, No.4/2023