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TECHNOLOGY OF CINEMATIC ARCHITECTURE IN SCIENCE FICTION MOVIES

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Abstract

Cinematic architecture in the broadest terms, portrayed spaces as a scene, where it conceives and reads the built environment in terms of sequences. It explores the effect of futuristic architecture and highlight the significant role of cinematic architecture in the society. Both movies and architecture function as languages, with two components: the signifiers, which are the tangible forms of signs, and the signified, which are the concepts, thoughts, and ideals that the signifiers contain. Unfortunately, the world is experiencing fast changes as a result of the massive rise of technology and capitalism, and the cinema industry plays an important role in displaying these improvements, showing the up - coming future through various science fiction movies, that either operate as an alert system for transformation, with the majority of these depictions viewing futuristic architecture and urban design as a dystopian realm, a lack of how to manage the upcoming issues, and these visions may come to pass. This paper aims to recognize different technological approaches to create the cinematic architecture, presented in the science fiction movies. To achieve this aim, the paper will start with literature review, based on desk research, reviewing previous readings, then the paper will analyze two case studies, which are the Movie of Tron Legacy, 2010, and the Avatar movie, James Cameron, 2009. As a conclusion, a better understanding the link between movie and architecture, it may be a better convey the complex concepts and ambitions for cities through architectural elements and signifiers.

Keywords

Cinematic Architecture, Technology, Futuristic, Science Fiction Movies, Technological Approaches, Architectural Elements

1. INTRODUCTION

Cinematic architecture in the widest sense, describes the affinity between urban space, architecture, and the moving image. Cinema and architecture are two dissimilar arts, one dynamic and another immobile, whose complicated interaction gives life to some other. The authors of these two manifestations have a mutual appreciation for the simultaneous processes involved in generating their works, and they recognize that one will always assist the other. Architecture adds support to a film by creating the ambiance, character, period, and site for the action. Film allows architects to realize concepts that will never be realized and to entice experiences that will never happen. Due to the participation of several aspects in the design and building process (financial, political, ecological, etc...), architecture cannot always operate as a true reflection for its society or setting in professional life. These elements can sometimes muddy the message intended for the observer or user of an architecture, resulting in a misconception of the motivations behind that architectural style. Thus, cinemarchitecture is a perfect embodiment of what architecture may be (Dewidar, 2007).

Movie and architecture share a life dimension, that is, a space in which one has lived. It's the breathing space and the creativity of living spaces. Both are populated places and living areas, narrativised by movement. Architecture and cinema reveal their constructive power when we touch the depths of personal and collective memory. The mythopoetic inspiration of architecture and cinema is expressed by using its physical means, its relationships and its assembly. The creation of film-based photographs is the emblem of architecture's physical development of space. There are also parallels with the real reality of an architectural area of that room with the viewers' interpretation of a sequence of the film. This requires films to build their environments and exaggerate and show a greater perspective than life. Architects and planners sometimes experience films very different from the large public, particularly when it comes to the genre of science fiction of "out of this universe" structures, towns or urban landscapes: they see buildings in the background. (Dewidar, 2007).



Fig.1a: Star Wars (1977) Fig. 1b Star Wars: Episode III - Revenge of the Sith (2005), source by Andreea 2006

Whether in movie or architecture, the use of narration may provide a framework for the reality experienced as the spectator passes through space. It foreshadows that our society is experiencing several rapid revolutions and changes, which arise from the massive growth of technology and capitalism, and the film industry plays an important role in portraying those changes, presenting the future with numerous science and fiction films which are a warning for change. It will seek to discuss both the wealth of techniques for using the moving picture for the constructed world and the determining impact of architecture and urban spaces as performers. Situations and activities, places and thoughts, are not outside. They describe each other and become a real experience. This duality is probably more obviously experienced from the world of cinema than anywhere else (Harvey, 2010).

"The film camera could provide a new way of thinking about and looking at the city: a way to critically apprehend what seems to have become culturally invisible; to achieve an understanding of self in relation to others in the social space we inhabit (Harvey, 2010).

Unfortunately, the world is experiencing fast changes as a result of the massive rise of technology and capitalism, and the cinema industry plays an important role in displaying these improvements, showing the up - coming future through various science fiction movies, that either operate as an alert system for transformation, with the majority of these depictions viewing futuristic

architecture and urban design as a dystopic realm, a lack of how to manage the upcoming issues, and these visions may come to pass. This paper aims to recognise different technological approaches to create the cinematic architecture, presented in the science fiction movies. The main hypothesis is that providing technological approaches from cinematic architecture and science fiction movies have direct effect on futuristic architecture and urban design. This research it's a qualitative type of work. The theoretical analysis will focus on scientific methodology, starting with a literature review, which provides an overview of the purpose and scope of prior studies and provides the context of the estimate used in the study of the display research, providing definitions, theories, principles, approaches, various reviews, individual feelings and behaviors, and similar examples. This information will be supported by previous readings, extracting from updated references. The study will analyse this data in a scientific frame work where each one of these data is suitable for the collection of certain type of information. While in the analytical study the research will use readings of references, and articles related to the topic and scanning official websites of architects.

2. LITERATURE REVIEW

In its widest meaning, cinematic architecture describes the relationship between urban environment, architecture, and moving image. To solidify this connection, it showed places as a scenario in which it conceptualizes and analyzes the built world in terms of sequences.

2.1.1 Definition of 'Cinematic Architecture'

This diverse interdisciplinary set creates cinematography as a way of rethinking, re-examining and reconstructing space and time and as a socio-cultural medium that allows to redefine the commitment to the environment. This investigates many of the socio-spatial productions in the city and how films reflect these urban transitions against a specific context, socially, culturally and historically. In terms of geographical, social and psychological aspects it reveals conscious urban layers. Cinema architecture is the ultimate fulfillment of what architecture can be like. Nowadays, the most commonly used concept is futurism, since it represents the shape of architecture and the built environment. It will aim to explore both the richness of strategies for using the moving image for the built environment and the determining influence of architecture and urban spaces as performers.

"Architecture exists, like cinema, in the dimension of time and movement. One conceives and reads a building in terms of sequences. To erect a building is to predict and seek effects of contrast and linkage through which one passes..."
(Nouvel, 2015).

2.1.2 Definition of Science fiction movies

"Science Fiction can be defined as "a type of literature and cinema that takes place in the fictional extend-times (especially in future times), create societies and living animates and in that sense, it mentions sciences, techniques and conditions, totally different from the ones in our time" (Larousse, 2010).

Science Fiction movies is a genre of fiction which mainly addresses the effect on society or individuals of real or imagined science. While writers in ancient times dealt with themes commonly associated with contemporary science fictions, their stories did not attempt to establish scientific and technological plausibility which distinguish science fiction from previous speculative writings. The genre formally originated on the West, where the social changes that the Industrial Revolution brought about prompted writers and philosophers to extrapolate technology's potential influence. Science fiction movies also have a speculative aspect, often including main aspects that promote science and technology. Architects and planners also experience movies somewhat differentiated from the vast audience, especially in the science fiction generation, which has "out of the future" buildings, cities or urban landscapes; they aim at the structures in the background and begin to examine the architecture. Movie provides an avenue for architecture to understand something that might never happen and to implore experiences that did not exist in reality (Larousse, 2010).

2.2 Historical Background of Cinematic Architecture

For more than a hundred years, cinema and architectural backgrounds have been closely linked. However, their interaction with and use of the city in new forms was more apparent at a few precise moments than in 1968, when national revolution and experimental cinematic involvement became witnesses. The campaigners and filmmakers, led the way and tried to restore urban environment to convey a desire to utopia or as a dystopian critical of the current order. Fifty years later it attempts to examine in how much worsening nature and attitudes of film-makers and architects were guided by the actual political revolution in urban landscape in 1968. In the other hand, architects were compelled to consciously consider their profession's role in establishing or refusing to solve the problems of the built environment that were so influential causes for disruption, and this reflection led to a greater design impact by other arts or a revision of architecture. Background and conceptions of futurism are cited, and the ideas of which futurism is mainly concerned describe the influence of futurism on science fiction movies as a function of outer history, machinery, speed and dynamism. The development of an environment in which the past, present and future are essentially interlinked, interpreted and imagined. Spot and case, space and soul are not outside (Dewidar, 2007).

2.3 Previews Readings

The connections between cinema, architecture and cities in recent years have become a prosperous trend that influenced many theoretical and technical discussions. There was substantial criticism of bow-architectural discussions, and practices have influenced the portrayal in film of a space, design and urban environments. In what may be seen as the opposite way. It explores ways of influencing spatial approaches in modern architecture and urban planning, as well as properties and methods traditionally established in the field. This book is not conceived as a dogmatic approach to how people can see or live in the environments around it, but rather to encourage the reader to experiment in ways they may previously have never thought about. It emphasizes that architectural and urban sites may have aspects that are not evident in daily passive experience of cities, whether cinematic or even scenography.

This interdisciplinary collection examines how films challenge their own reference frame and at the same time how their shape is the question of their thinking. Based on the axiom that movies are a tool for the viewers, this book explores how diverse types of cinema reinvent and re-design the field of conventional disciplines, allowing a variety of ways of thinking and practice. Architecture, technology, visual literature, case theory and historiography are areas under study.

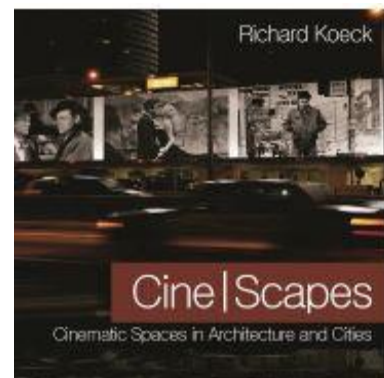


Fig.2: Cine-scapes, source by Richard K., 2012



Fig.3: Forms of the cinematic Source by author Mark B., 2021

2.4 Using Architecture in Story-Telling

The images of the built environment in movies range considerably from dystopian future to space opera visions, from post-apocalyptic decaying structures to entire virtual worlds. Some of them make use of imaginary structures incorporated into real-world contexts, and others make use of real buildings due to their distinctiveness or iconic status. It considers the five pillars of science fiction to be: alien contact, artificial intelligence, technological breakthroughs, and space exploration/adventure and origin stories. The goal of such categories is to provide a fundamental framework for analysis (or the moods which the built environment is utilized to achieve), and certain films may appear in more than just category (Andreea, 2006).

2.5 Pillars of Science Fiction Movies

When science fiction is stated, the first thing that comes to mind is the future, futuristic technological developments, and a future civilization created from existing concepts.

2.5.1 Technological Future

Typically, the future is depicted in such a manner that it makes a remark on current difficulties in society, the environment, politics, economics, and religion, or it calls into question advancements in many sectors of research. Researchers have been motivated to create such systems by the usage of speculative technology in films. This kind of storylines, which take place in the future of Earth within a civilization that has followed some upward path of technological growth without major failures, is the most popular theme in sci-fi films. As a result, this is the deepest in architectural speculative concepts, and it is typically intended to inspire. This is a broad subgenre that covers utopian and dystopian environments, as well as the settlement of other regions of the universe where humanity have carried their history and architectural styles (Andreea, 2006).

a. Utopia

Films set in a generally peaceful future saturated with technology and movies in which society is depicted as ideal even if the narrative takes other turns or the protagonists becomes conscious of a different reality during the movie

b. Dystopia

If these setups emphasize uniformity, symmetry, and rhythm, another approach is to create an assemblage of elements such as buildings, automobiles, and rubbish topped with brightly colored advertisements. But, regardless of the scenario, a common feature of all dystopian planets is the absence of greenery; nature does not belong in these Earth's futures.



Fig.4a: Demolition Man (1993)



Fig.4b: Star Trek Into Darkness (2013)
source by Andreea, 2006

2.5.2 Post-apocalyptic Environment

Regardless of the situation, whether it is an ecological disaster, a disease or a viral infection that kills humans, an atomic holocaust, an alien invasion, or the rise of artificial intelligence (AI) that makes the decision to clean humanity off the face of the Earth, a few people manage to live the end of days only to live in the destroys of modern civilization. One hardly ever see new buildings in these films, and when it do, the constructed environment is made up of salvaged parts and pieces, scavenged or re-purposed materials and installations. In a few films, those who caused humanity's demise either have their own base of operations that has suffered little to no damage or have created some new facilities in order to retain control and/or security. However, not all stories take such a negative view of technology, with others imagining a post-apocalyptic society undergoing rebuilding, with one of the first stages being the construction of a massive wall to isolate it from the hazardous environment. (Andreea, 2006).



Fig.5a: After Earth (2013)



Fig. 5b Star Trek V: The Final Frontier (1989), source by Andreea, 2006.

2.6 Forms of ‘Cinematic Architecture’

The research looks at the similarities and differences between concepts about architectural presentation and design and those found in cinema, television, and digital animation.

2.6.1 Narratives and Expressive Spaces

An age of socioeconomic and cultural developments brought about by the rise in the speed of daily life since ‘Modernity’. The way space and place are constructed, employed, observed, and experienced has evolved as a result of the quest for new paths in architecture, social sciences, and art. The "oeuvre of cinema" is the most important location in which these new types of places and notions may be viewed. Let should investigate the interpersonal interactions between individuals who utilize non-places to gain a deeper knowledge of modifications in today's space. Movies are an ideal medium for observing people-place relationships that go beyond the architecture of the urban built environment.

2.6.2 Tangible Form

The local, social, and associative significance of locations such as buildings are not included in the document. With a growing shift toward a principles approach to historic building conservation and protection, the strategy we propose offers a unique opportunity to engage more deeply with local and social values. Additionally, this relationship may be cultivated as a community resource: connecting associative values with tangible historical locations can open up new avenues for interpretation, as well as increase interest in a location and perhaps contribute to its restoration.

2.6.3 Intangible Form

Historical narrative is an appropriate method for giving a voice to moviegoers and allowing them to give evidence to their own life experience in respect to their movie going behaviors in way to involve with lived experiences of real viewers in their sociocultural, historical, and contextual factors, and to investigate the role of cinema within everyday life and leisure culture. Among the most surprising findings of oral history study into cinema is that recollections of going to the movies circle significantly more commonly around the social act of going to the cinema than the films viewed.

2.7 Analysing International Examples

The mention of the two international movies let understand the way of thinking and elements of cinematic architecture used in those science fiction movies in particular.

2.7.1 Analysing of the movie: Star Trek, Into Darkness, J. J. Abrams, 2013

JJ Abram’s 2013 Star Trek, Into Darkness used London as a setting for the movie. It was focused on the recognizable futuristic skyline because of the iconic structures’ inclusion. Shard, the Gherkin, and St. Paul’s Cathedral were an example of the inclusive structures. The main aim was to maintain the real geography of the city by implementing other futuristic elements. The futuristic cityscape was directly an exaggerated form of contemporary architecture. It seemed like evolving from the present. It wasn’t only

represented by its architectural styles but by architectural theories and uncertainties. Contemporary and futuristic elements were demonstrated and analysed through this film in its spatial design.

"I realized that I loved using computers to create something but being an architect just wasn't going to keep me interested" (Kosinski, 2010).



Fig.6: showing the architectural style of the urban futuristic cities in the movie.
Source Harvey, 2012

2.7.2 Analysing of the movie: Blade Runner, Denis Villeneuve, 2017

The Blade Runner, possibly the second largest science fiction city view ever represented in a Metropolis ranking. The future of the elevated city view of Metropolis was riffed by Blade Runner but a beautiful portrayal of urban street life in the future was deduced. This view of future urban decay is grim, endlessly dark and wet and full of detail. It is a bright, dirty, and jam-packed street future, in which every new technological innovation that we develop will live alongside what was before it. The film stands out from more speculative dreams of the future that build science fiction cities from the ground up. Rather, the world of the Blade Runner, is a dense and perhaps even more realistic industrial jumble for it.



Fig.7: Showing the architectural style of the urban new cities in the movie. Source Andreea, 2006

The recent so-called gulf futurism movement describes a very specific architectural brand and urban design that powers the Middle East. Dubai, the future dystopian town. This new wave of large oil design, inspired by video spiel and Hollywood cinema, is dominated by several millionaires who develop amazing futuristic landscape. Dubai is one of the key designers behind Blade Runner and is one of the hot beds of futuristic Gulf Architecture. Life is the impersonation of art, and then art is the imitation of life. The evolution of our cities during the last century can explicitly see this eternal back and forth. Perhaps at present the most striking is a tendency to be influenced explicitly by the visions of science fiction that are deeply entrenched in dystopian perspectives for some of these great futurist cities.

2.6 Parameters of Analysis

These examples illustrate how the above architectural analogies of cinematic proposals can be viewed in terms of architecture and thus used in architectural design. In addition, it highlighted that the examples that have provided here are only a few options and that we should not only restrict readers of our study to those. As it expand and explain further in this paper, only the ability of each architectural planner limits the amount of forms in which filmic concepts can be represented in the architect. The spaces are complex spatially, uncontracted and interflowing by their materiality, and the others are well defined, rigid and fractured spaces. The features of linearity and dynamism are the formal level and, at a more profound level, the general expressive characteristic of each of the subjects examined. As for the properties of punctuation, it is an expression of the structuring of the dimensions of space and time. And ultimately, overlapping and inter flow are abstract level components.

The preceding research, the study deduce a group of parameters to be in the analysis of case studies, which are:

Table 1: Table of parameters of cinematic architecture and sci-fi movies (by authors)

Cinematic Architecture	Sci-Fi movies
1. Narrative and Expressive Spaces	1. Filmic concepts and meanings
2. Futuristic Architecture & Urban design	2. Architectural visions
3. Architectural Elements	3. Technological Futures
4. Technological Approaches	4. Perceptions

These parameters must be referred to when investigating cinematic architecture and sci-fiction movies. The following case studies justify them.

3. RESEARCH METHODOLOGY REFLECTING THE SUGGESTED PARAMETERS

This paper is based on three research methods: the inductive method, the analytical method and the comparative method. The first one was used to gather data about the selected three case studies based on consulting a variety of sources. The second was used to analyse these data, providing figures and necessary drawings and diagrams to enhance explanations. The third method was a comparative analysis between three case studies. This research it's a qualitative type of work. In this context, the study used the parameters, mentioned in table2.01, to analyse the case studies which were selected according to the following criteria:

- a. Having emphasis on the cinematic architecture technological approaches in sci-fi movies.
- b. Diverse way of thinking and targets by the authors.
- c. Viewing the visions and architectural concepts.
- d. The importance of those sci-fiction movies of the 21th century.

4. FINDINGS

This research it's a qualitative type of work. That involves collecting and analyzing non-numerical data.

The practices have influenced the portrayal in film of a space, design and urban environments. In what may be seen as the opposite way. It explores ways of influencing spatial approaches in modern architecture and urban planning. This examines how films challenge their own reference frame and at the same time how their shape is the question of their thinking. Architecture, technology, visual

literature, case theory and historiography are areas under study. Tracing themes of disease and decay in the narrative of urban renewal and development.

Table2: Variety of representations of the city life as urban design and planning

Metaphors	Metonyms	Symbols	Story-telling	Material experience of the urban design and planning
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It's about how the urban is presented in a variety of presentations of a city life such in Metaphors, Metonyms, Symbols, Story-telling and Material experience of the urban design and planning.

This diverse interdisciplinary set creates cinematography as a way of rethinking, re-examining and reconstructing space and time and as a socio-cultural medium that allows to redefine the commitment to the environment. This investigates many of the socio-spatial productions in the city and how films reflect these urban transitions against a specific context, socially, culturally and historically. In terms of geographical, social and psychological aspects it reveals conscious urban layers.

5. DISCUSSIONS

It's been shown that horizontally increases the quality of architecture of futuristic world, and architectural elements where the futuristic buildings will have more complex systems, form and layout, technology of structure, eco system of future vision, sustainable elements, Interior features, ramping structure suspended, Shape and form based on grid, bridges and a 'digital border' interior features, clear grid to a futuristic technological world, sustainable materials and elements, minimalist. It illustrates how the above architectural analogies of cinematic proposals can be viewed in terms of architecture and thus used in architectural design. In other hand, it explores ways of influencing spatial approaches in modern architecture and urban planning, as well as properties and methods traditionally established in the field. This interdisciplinary collection examines how movies challenge their own reference frame and at the same time how their shape is the question of their thinking.

Connecting this form to the films previously mentioned, for science fiction, the futuristic label may be used because it mentions future elements and approaches and technology. If the science fiction films are examined, it is important to handle them within both the intellectual and the formal context. To achieve the aim of recognising different technological approaches to create.

Table 3: Technological approaches to create the cinematic architecture

Technological approaches to create the cinematic architecture					
-The futuristic buildings will have more complex systems.	-The form and layout.	-The technology of structure	-The sustainable materials and elements	- The reflection in planning and urban design.	

6. CONCLUSION

This research paper mention the problem of rapid changes as a result of the massive rise of technology and capitalism, and the cinema industry plays an important role in displaying these improvements, showing the up - coming future through various science fiction movies.

Based on the previews research, the study gives main points as a conclusion. Which the main points are:

- a. A set creates cinematography as a way of rethinking, re-examining and reconstructing space and time and as a socio-cultural medium that allows to redefine the commitment to the urban environment.
- b. Connecting the context of this form over the exemplified films, the label of futurist can be used for science fiction, because they are mentioning about future and technology elements and approaches, when a science fiction cinema is examined, it is necessary to handle it both in intellectual and formal context, it is essential to examine the relationship between its visual and intellectual language and also its relation to futurism's intellectual and formal language.
- c. Predicting solution for futuristic problem, through their varied plots and architectural depictions of the city. Therefore, the movie will spread a message to avoid the problems which can be occurred.
- d. Increasing the understanding of the relationship between movie and architecture, that are enhancing our ability to express via architectural elements (signifiers) our complex ideas and visions on cities.
- e. Technological approaches reflect the effect of cinematic architecture on futuristic architecture & urban design.

It demonstrates how the architectural analogues of cinematic suggestions discussed above might be evaluated in terms of architecture and so used to architectural design. On either hand, it looks at how to influence spatial approaches in current architecture and urban planning, as well as qualities and methods that have been used in the area for a long time.

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