



The Use of Digital Effects in Science Fiction Cinema and Interstellar (2014) Movie

Yrd.Doç. Dr. Barış Tolga Ekinçi

*T.C. YeniYüzyıl University, Department of visual communication design
Tolgaekinci80@hotmail.com*

ABSTRACT

It is difficult to define science fiction. The limits of science fiction are uncertain. Science fiction genre is generally correlated with technology. Fictional and fantastic elements are found in the basis of science fiction. However, the topics of science fiction may change. Movies about space interest the audiences every time. Especially, space theme has been used since the movie of George Melies *A Trip to the Moon* (1902). Technology is used in the most intensive in science fiction genre. In this context, the use of digital effects is an important research area in science fiction cinema. It is a true that academic studies held on science fiction are less in our country and in the world. In this study, the use of digital effects will be examined in science fiction cinema. The film of Christopher Nolan *Interstellar* (2014) movie, which is a popular product of this genre will be analyzed. In study, the influence of use of effect is tried to reveal in science fiction cinema.

Keywords: Science Fiction, Digital Effect, Special Effect, Christopher Nolan, Interstellar.

Bilim kurgu sinemasında dijital efektlerin kullanımı ve interstellar (2014) filmi

ÖZET

Bilimkurguyu tanımlamak zordur. Bilimkurgunun sınırları belirsizdir. Sinemada bilimkurgu türü genellikle teknolojiyle ilişkilendirilir. Bilimkurgunun temelinde düşsel ve fantastik öğeler bulunur. Ancak, bilimkurgunun konuları değişebilir. Uzayla ilgili filmler izleyicilerin ilgisini her dönem çeker. Özellikle, George Melies'in *Ay'a Seyahat* (1902) filminden beri uzay teması sıklıkla kullanılmaktadır. Teknoloji en yoğun bilimkurgu türünde kullanılır. Bu bağlamda bilimkurgu sinemasında dijital efektlerin kullanımı önemli bir inceleme alanıdır. Ülkemizde ve dünyada bilimkurgu üzerine yapılan akademik çalışmaların sayıca az olduğu bir gerçektir. Bu araştırmada, bilimkurgu sinemasında dijital efekt kullanımı ele alınacaktır. Bu türün popüler bir ürünü olan Christopher Nolan'ın *Interstellar* (2014) filmi



analiz edilecektir. Çalışmada, bilimkurgu sinemasında efekt kullanımının etkisi ortaya konmaya çalışılmaktadır.

Anahtar Kelimeler: Bilimkurgu, Dijital Efekt, Özel Efekt, ChristopherNolan, Interstellar.

INTRODUCTION

As Todorov said that science fiction is a scientific extraordinary and it is a film genre that being expressed with a different reality (Ersümer, 2013: 13). In this genre fairyland is usually a myth or magic world. Sci-fi movies walk around between real and unreal owing to them show the unseen. However, unreal is in the foreground in science fiction movies. Escape to the future themes or a world that being protected by capitalist system are submitted in most science fiction films. In this context, having unreal makes it ideological potentially.

Nowadays, world and glimpse into the world has changed. Especially, technological advances and digital technologies have been effective in this (Baudrillard, 2011: 20). Societies have spent tremendous effort, energy and money with the help of virtual technologies (Adanır, 2010: 53).

Science fiction movie, which is a popular film genre will be analyzed in this study. The purpose of the study is to reveal the effects used in sci-fi movies that contribute filmic reality. Special effects are applied by the helps of computers in sci-fi movie. However, effects that based on computers may not be preferred in some cases.

In this context, the film of Christopher Nolan *Interstellar* (2014) will be analyzed. Physical effects are located instead of digital effects in *Interstellar*. The effects that used in the film are illustrated a minimalist structure in place of augmented reality. The realistic effects used in the film show the way to examine this genre. In this context, effects used in the film will be analyzed as linked with narration.

SCIENCE FICTION MOVIES

The first examples of the science fiction genres were seen in cinema in 1900s. George Melies was the first filmmaker that showing the power of unreal. Such techniques; dissolve, fade in-out, coloring, single-frame shooting are referred to him. In this sense, the film of George Melies *A Trip to the Moon* (1902) is among the first ones. One of the most important scenes of this film is that Moon's face is depicting as a smiling human face. Melies is the first person who realizes the power of cinema that changes the reality.



A Trip to the Moon (1902)

Filmmakers may represent reality in different ways. In this respect, they can handle different types of themes. It can claim that the genre of science fiction progress with the efforts of different filmmakers. In this context, the most important example of science fiction is the film of Fritz Lang *Metropolis* (1927). Brigitte Helm reflects a dual spirit in the movie which is shown giant city of the future; unbalanced scientists who want to enslave the people. City miniatures, models and make-up techniques are used at every stage of the film. *Metropolis* is considered one of the pioneers of science fiction even today.



Metropolis (1927)

The word of fantastic, which means to visionary, fanciful, extraordinary and wonderful has been called with science fiction in the same period. Development of sci-fi has shown parallelism with the progress of Western civilization. Cinema and TV mediums have been largely influenced by the film of Orson Welles, *War of the Worlds* (1938). Science fiction movies, which subjects are space theme have interested the audiences. Specific examples of this genre include; *Superman* (1948), *It Comes from Outer Space* (1953), *Them!* (1954), *The Day the World Ended* (1955), *Planet of the Apes* (1967) ve2001 A



Space Odyssey (1968) (Onaran, 1999: 104-107). Technology is a reconstructionist metaphor that could endanger the continuity of the system (Ryan & Kellner, 2009:389). It can be claimed that the movies about space journey are the least sensitivity to social problems. However, these movies are valuable examples in terms of presenting the realism of Hollywood.

In this respect, they can be revealed the great discrepancy of modern capitalism. Science fiction is limited in time and after a while it ceases to be science fiction. Nowadays, sci-fi comprises of such themes; space, space crafts, space stations and space journeys, life on other planets, aliens and alien attacks (Özön, 2008: 250). Science fiction is politically engaged, but this engagement is not usually challenger. Generally, movies of this genre defend the status quo (to destroy the enemy or find a safe place). The ideological consequences of these genre movies usually progress on the road of sovereign. These films can include easily misogyny, racism and national chauvinism (Hayward, 2012:86). In this context, they must examine cautiously.

SPECIAL EFFECTS IN SCIENCE FICTION

Special effects practices have shown a great improvement with the development of technology. Moreover, it has an important place as a result of the developing technology. Special effects separate according to their making style, application time and its feature; illusions, miniature effects, stop motion animation, matte painting, make up, physical effects, sound effects, animatronics and digital effects CGI¹.

Illusions are the practices like the earliest works of Melies. Dissolves and merging multiple images in the same frame techniques are in these effects (Yurdigül & Zinderen, 2013: 32). Miniature effects are used for difficult scenes. Miniatures are built for these scenes (like *Metropolis*) (Yurdigül & Zinderen, 2013: 35). Models and the place of puppets are cautiously changed by hand in stop motion animation techniques. Then by, every modification is recorded step by step (Yurdigül & Zinderen, 2013: 37).

A part of film is closed with using a black veil in matte painting technique. This black space is filled with another camera record. Matte painting is generally used in space scenes (Yurdigül & Zinderen, 2013: 38). Make up includes all of the costumes, hair, make up and prosthetic models. Physical effects are based on actual shots. Physical effects are used in explosion scenes, action scenes and to create natural environment effects (like rain, snow) (Yurdigül & Zinderen, 2013: 44). Sound effects consist of background sounds, scenes sounds, noises, music and other sounds. The most common

¹Computer generated image

use is Foley. In this method, background sounds are created in studio (like opening door or closing door sounds and glass filling sounds). Foley stage is used for creating these sounds. Foley artist generates all sounds of the movie as real time (Canikligil, 2007: 217). Animatronic is a special effect type that is based on the movement of various puppets. This technique has not been called this name until 1960s. Edwin S. Porter created a giant eagle with hinged wings in *The Eagle Nest* (1907). Nevertheless, Melies made a giant monster greater than seven meters and he provided the movements with cables. The turning point of this technique was based on Fritz Lang, who was built a giant dragon in *Die Nibelungen* (1924) (Yurdigül & Zinderen, 2013: 42-44).



The Eagle Nest (1907)



Die Nibelungen(1924)

Animatronics applications have appeared as an alternative for the actors, who wearing costumes and dressed as animals in theater and movies. Nowadays, this practice is realized with the help of computer technologies. Tars and Case robots that are located in *Interstellar* movie are created by this technique. Digital effects are created with the help of computer technologies. Digital effects are the effects that created with the help of

computer technology like; chromakey, compositing, bullet time, motion capture (mocap), digital matte painting, image manipulation (Yurdigül & Zinderen, 2013: 49).

DEVELOPMENT OF DIGITAL EFFECTS

The history of computer generated image (CGI) was based on 1940s. However, Computer technology had not been used in arts until the works of Whitnet Brothers in 1960s. Digital effects are referred to the sci-fi movies. Computer technology has been used for creating unusual images since 1970s in science fiction movies. For instance, Gary Demos and John Whitney have generated 2D digital images for *Westworld* (1973) movie. Shot of the robot² was shown by digital effects.



Westworld (1973)

3D computer generated images were used in *Star Wars* (1977) and *Alien* (1979). The film of Nicholas Meyer *Star Trek II: The Wrath of Khan* (1982) is regarded as a turning point (Bernard, 2011: 11-12). These movies have presented this new technology both formal level and context of story (Cornea, 2007: 251). After the disappointment of *Tron*(1989), Ron Howard and James Cameron have used CGI in *Willow* (1988) and *The Abyss* (1989). Their achievement has motivated the others like *Terminator 2: Judgement Day* (1993), *Jurassic Park* (1993) and *Toy Story* (1995) (Bernard, 2011: 11-12).

Nowadays, while on the one side can be a pure reality, on the other side may be the fantastic reality in science fiction. Science fiction genre has been changed in time like the other genres. It seems ironic to suggest that genre that has challenged and pushed at the limits of both filmic realism and the medium of celluloid for so long might now become obsolete, just as we enter a post celluloid age (Cornea, 2007: 267). If modern cinema comes to end, science fiction movies will continue its genre.

²Played by Yul Brynner



Filmmaking applications have been increased depending on improvement in computer technology and CGI. Nevertheless, filmmaking costs have decreased. Another essential innovation is the computer animated performance. For example; motion capture is one of the most effective methods.

A more well-known example of computer-generated performance is the motion capture of actor Andrew Serkis to create the character of Gollum in *The Lord of the Rings* series (Bernard, 2011: 11-14). *The Hobbit* series include many CGI characters like Gollum (Andy Serkis) and Azog (Manu Bennett). The characters have been created that including the shooting of real players by motion capture technology. Subsequently, CGI character models have been generated.

As Olssen stated that; "The characters were created via performance capture technology, which involves filming the actors live, then using CGI to animate the character models. Editing the Gollum and Azog scenes was a complex job. It was easy to visualize the Gollum scenes because Andy Serkis was captured in the actual live action footage. However other characters like Azog were shot separately on a performance capture stage, which required us to layer separate material into a single shot. We were cutting vertically in the timeline as well as horizontally. In the early stages, many of the scenes were a patchwork of live action and placeholder animations, so I used PIP effects to overlay elements to determine the scene timing. Naturally, I had to do a lot of temp green-screen composites. The dwarves are full-size actors, so for many of the scenes we had to scale them down and reposition them in the shot" (<https://www.avid.com/US/about-avid/customer-stories/The-Hobbit-Trilogy-Comes-to-Life-with-Media-Composer-Magic14.01.2015>). CGI characters can still contribute to the narrative through character development and relationship building.



The Hobbit: An Unexpected Journey (2012)

DIGITAL EFFECTS AND REALITY

If we compare the film of Méliès *A Trip to the Moon* with the movie of Stanley Kubrick *2001: A Space Odyssey*, it can be claim that visual effects tend to reality. The attraction of unreal has been provided with visual shocks in *A Trip to the Moon*. However, the attraction of *2001: A Space Odyssey* has been created with a minimalist design. Front projection was developed for *2001: A Space Odyssey* by Stanley Kubrick, who was dissatisfied with the quality rear projection, the film was the first feature wherein front projection was used.



2001: A Space Odyssey

Kubrick has used real actors instead of CGI in the sequence of anthropoids. Moreover, he has used a match cut in a scene that the anthropoid threw a bone to sky. The star gate



sequence was produced by slit scan: along exposure of a streaking rush of color and light in a single frame through a slit screen (Ryu, 2007: 94-98).

Filmmakers use digital cameras and they edit in computer at the present time. Stock footages are changed in the editing process by computer technology. Stock footage is changed in the editing process by computer technology. Bill Nichols notes that "Something of reality itself seems to pass through the lens and remain embedded in the photographic emulsion," while also recognizing that "Digital sampling techniques destroy this claim (Prince, 1996: 35).

Synthesis of CGI and real footage look like to real unbelievably. According to Andrew Darley the reason is that has continued from the development of visual technology since 1960s (Cubitt, 2004: 267). The digital child of neo-baroque³ not only finds in Hollywood, but also it can be seen in the rest of the world. Cubitt stated that "In a typical neobaroque shot, mobile camera work (and digital compositing) eliminates the cut between layers to promote a vectoral movement totalized in the bounded world inside the spatial image...Classical spectacle deployed a closed system of linear narrative to shut down the future: the baroque marks out the limits to our habitation of the present" (2004: 228).

Interstellar (2014) Movie and the Use of Effect

Tag of movie

Director: Christopher Nolan

Cinematographer: Hoyte Van Hoytema

Music: Hans Zimmer

Editors: Lee Smith

Year: 2014

Time: 169 minutes

Genre: Science Fiction

Storyline

United States Government collapses and natural resources are consumed due to the global war. Cooper (Matthew McConaughey), is the protagonist character of the film. He is a college-educated good old boy and former NASA test pilot that had to settle for near abysmal conditions in rundown farmhouse farming for a living, driving a 40 year old truck, and living off nothing but corn. Cooper's family consists of his 60something father

³ Neo-baroque art is just a name that we describe a type of cultural solution to the problem of complexity.



in law, Donald, his 15 year old son Tom, and 10 year old daughter Murph (<http://www.imdb.com/title/tt0816692/synopsis> 12.04.2015). Mysterious elements create an action in the movie. Cooper follows this mysterious with the help of his daughter and he meets with Dr. Brand (Michael Caine). Dr. Brand has a plan that moving human beings to another solar system with using wormholes. A dozen scientists to search for a habitable planet have committed themselves. Three of them have sent some hopeful information. More stuff is revealed about the bunker and the mission, the bunker is a centrifuge, which is projected to become something else later on. And there are two plans with the mission: Plan A is to make the centrifuge a space station to get the people of Earth off to safety and plan B is to colonize the most habitable of the three planets (<http://www.imdb.com/title/tt0816692/synopsis> 12.04.2015). Cooper, Amelia (daughter of Dr. Brand) and two genius robot (Tars and Case) go with this space journey.

NARRATION OF THE MOVIE

The narration of the *Interstellar* is based on events; like a race against time, a space odyssey, journey to the wormhole. The concept of time is relative in the film. Multiple filmic events are in the movie. For instance; the Endurance team are looping Saturn and come upon the wormhole, which resembles a plasma globe and will shortcut the group to the three planets. The group decides to risk themselves on Planet of Miller, although it is very close to a black hole called Gargantua meaning every hour will equal seven Earth years. Cooper, Amelia, Doyle, and the other robot called Case decide to risk themselves and intend to be in and out of there in just minutes to survey. All they find is shallow water and wreckage of Miller's ship, who apparently died and arrived just an hour or two earlier, even though she sent the thumbs up beacon on Earth 12 years before (<http://www.imdb.com/title/tt0816692/synopsis> 12.04.2015). Nolan's innovative space crafts, planets, robots and architectural designs draw attention in *Interstellar*. All of them are designed by Nathan Crowley. Ahead of Crowley worked with Nolan in *Dark Knight* (2008) and *Prestige* (2006).

As Crowley stated that "These designs are both modern and retro. The Wizard of Oz (1939) like inspiration. That's why Matthew McConaughey's farmhouse (constructed in Alberta, Canada, or "Days of Heaven" country) had to be warm and cozy, despite the blight that's ravaged Mother Earth. By contrast, if there is no place like home, then the far off ice and water planets had to be anything but beautiful and familiar. Both were shot in Iceland. A trip to Mackem Bay in the north of England inspired the otherworldly look of marble ice sheets. And the water planet is comprised of 4,000-foot tidal waves, the likes of which we've never witnessed before"(<http://blogs.indiewire.com/thompsononhollywood/how-interstellars-nathan->

crowley-designed-the-ultimate-trip-from-wormholes-to-snarky-robots-20141106
05.05.2015).

EFFECTS AND DESIGN OF TARS AND CASE ROBOTS

Nolan has cut the frames for analyzing the size of robots. Tars and Case are the animatronics designs. Interaction with other actors of Tars and Case robots has been approached in a realistic structure (<http://www.avclub.com/review/christopher-nolans-interstellar-uneven-space-odys-211389> 23.03.2015). According to Lacan, a woman is a symptom of man. It gets a metaphorical sense in relationship between Cooper and Tars. In other words, sexual differences are turned into human beings and robot differences in *Interstellar* (Zizek, 2013: 39).



***Interstellar* (2014)**



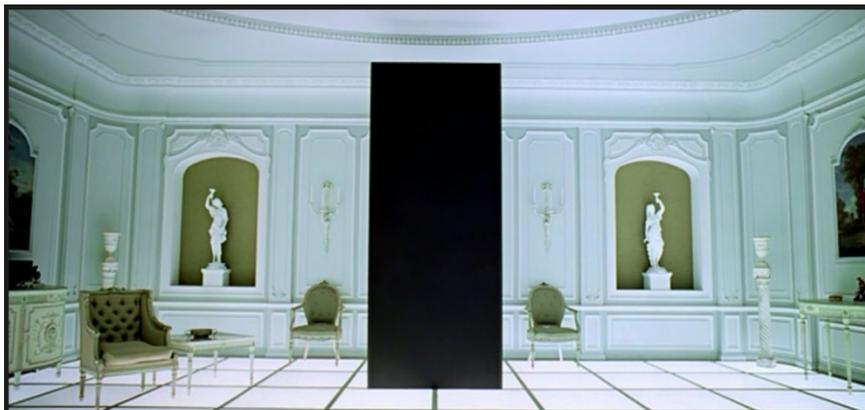
***Interstellar* (2014)**

Tars and Case robots have been inspired by a monolith icon, which was in *2001: A Space Odyssey* (1968). Nolan has designed scissors effects for it. Nolan expressed that "I was a fan of minimalism and Mies van der Rohe. We started with a monolith and divided it into four. Then we came up with mathematical divisions of four for something more sophisticated with the block breaking down into three pins and four legs. It was continuously matching divisions of itself. After repeated viewings, the same can be said

of *Interstellar*" (<http://blogs.indiewire.com/thompsononhollywood/how-interstellars-nathan-crowley-designed-the-ultimate-trip-from-wormholes-to-snarky-robots-2014110605.05.2015>).



***Interstellar* (2014)**



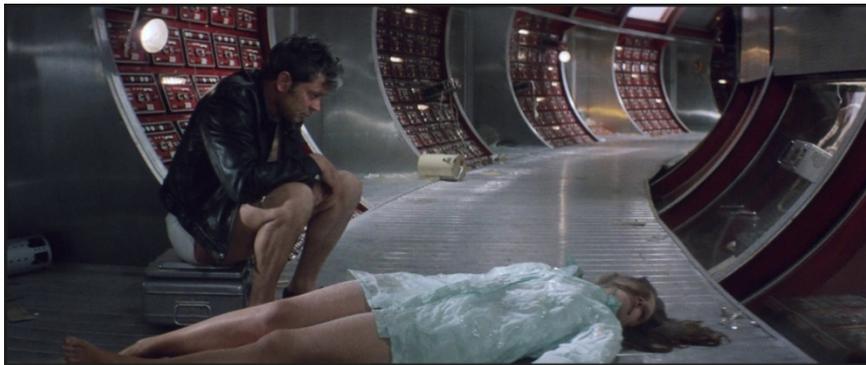
***2001: A Space Odyssey* (1968)**

Tars and Case robots look like a walking closet in the *Interstellar*. Actually, they have been moved by real actors. Christopher Nolan has used physical effects instead of CGI. Digital effects have been used only to clear the actors who manage the puppets. This cannot be done in real life.

The puppeteer Bill Irwin is filmed when he directs the puppet. And then, he was erased by digital practices. Different versions of robots have been created for different scenes. For instance, some models can be used on the water. This minimalist design has been inspired by Ludwig Mies van der Rohe. Rohe has designed some architecture buildings like IBM skyscraper and Farnsworth House in Chicago. Also Rohe has created some furniture like Barcelona and Brno chairs. They look like Tars and Case robots

(<http://www.cnet.com/news/interstellar-robots-were-real-not-cgi-tars-and-case/>
09.05.2015).

Interstellar reminds us Andrei Tarkovsky's *Solaris* in many ways. Both films stretch out a long set (world and space). Both movies have a widower protagonist character that has a heavy duty. In both cases, he is leaving behind a young girl and an older man his niece and father in *Solaris*, his daughter and father in law in *Interstellar*. Both films shift the action into space abruptly, are set partly to organ music (Bach in Andrei Tarkovsky's *Solaris* and one of Hans Zimmer's better scores in *Interstellar*) (<http://www.avclub.com/review/christopher-nolans-interstellar-uneven-space-odys-211389> 23.03.2015). When both films compare, it can be seen that *Solaris* is more minimalist than *Interstellar*. Christopher Nolan is a popular story teller, but he balances the action in in most instances.



***Solaris* (1972)**

CONCLUSION

Nowadays, unreal images can be shown as a real in cinema. Fantastic and real can be together. It is possible to change reality. Especially, there are several ways to canalize reality in science fiction (Şenyapılı, 2003: 87). Digital technology has been used commonly in all films. Completely CGI based CGI films have been done. Likewise, CGI images made in digital media are combined with real shoots and they are used as supplemental of films. Science fiction movies will be shooted in digital sets or virtual sets without actors in the future. However, sense of reality will remain on one side. The more computer tricks will develop, the more sense of reality will be continued. Christopher Nolan has used computer based effects in minimally in *Intersteller*. He has tried to create a different reality with minimalist effects. Digital effects have gained a digital reality like a virtual world in science fiction. In spite of that, science fiction has preferred the reality for the sake of a general aesthetic. Realism has pulled into the aesthetic field and it has become a rule.



In this context, the use of effect can be divided in two approaches. Some filmmakers may prefer to use the digital effects in minimal level (like color correction process and masking). They want to protect the sense of reality. This may preserve the filmic reality a certain extent. The others may prefer to use all of the digital effects in science fiction. However, reality is presented as relatively in both cases. Because realism has become a rule. Consequently, science fiction cinema, which has lost its function has seemed like an augmented reality, because it has exhausted all that it has.

REFERENCES

- Adanır, Oğuz. (2010). *Baudrillard*. First Edition. İstanbul: Say Press.
- Baudrillard, Jean. (2011). *Neden Her Şey Hala Yok Olup Gitmedi?.* (translated by: Oğuz Adanır). İstanbul: Boğaziçi University Press.
- Bernard, Kaitlin. (2011). *Between Reality and Realism: Cgi and Narrative in Hollywood Children's Films*. Department of Communication Faculty of Arts University of Ottawa.
- Canikligil, İlker. (2007). *Dijital Video ile Sinema*. 1. First Edition. İstanbul: Pusula.
- Cubitt, Sean. (2004). *The Cinema Effect*. London: Massachusetts Institute of Technology.
- Cornea, Christine. (2007). *Science Fiction Cinema: Between Fantasy and Reality*. Edinburgh University Press.
- Ersümer, Oğuzhan. (2013). *Bilimkurgu Sinemasında Cyberpunk*. İstanbul: Altıkkırkbeş Press.
- Hayward, Susan. (2012). *Sinemanın Temel Kavramları*. (translated by: Uğur Kutay, Metin Çavuş). İstanbul: Es Press.
- Prince, Stephen. (1996). *True Lies: Perceptual Realism, Digital Images, and Film Theory*. Film Quarterly, Vol. 49, No. 3. (Spring, 1996), pp. 27-37.
- Ryan, Michael. Kellner, Douglas. (2009). *Politik Kamera. Çağdaş Hollywood Sinemasının İdeolojisi ve Politikası*. (translated by: Elif Ö.), İstanbul: Ayrıntı.
- Ryu, Jae, Hyung. (2007). *Reality & Effect: A Cultural History of Visual Effects*. Georgia State University. Department of Communication.
- Onaran, Alim, Şerif. (1999). *Sinemaya Giriş*. Second Edition. İstanbul: T.C. Maltepe University Press.
- Özön, Nijat. (2008). *Sinemaya Giriş*. Agora.
- Şenyapılı, Önder. (2003). *Sinemave Tasarım*. Second Edition. İstanbul: Boyut.
- Yurdigül, Yusuf. Zinderen, İbrahim. (2013). *Sinemave Televizyonda Özel Efekt*. İstanbul: Doğu Bookstore.
- Zizek, Slavoj. (2013). *Yamuk Bakmak: Popüler Kültürden Jacques Lacan'a Giriş*. (translated by: Tuncay Birkan). İstanbul: Metis Press.



Internet resources

<http://www.avclub.com/review/christopher-nolans-interstellar-uneven-space-odyssey-211389> 23.03.2015

<http://blogs.indiewire.com/thompsononhollywood/how-interstellars-nathan-crowley-designed-the-ultimate-trip-from-wormholes-to-snarky-robots-20141106>
05.05.2015

<http://www.cnet.com/news/interstellar-robots-were-real-not-cgi-tars-and-case/09.05.2015>

<http://www.imdb.com/title/tt0816692/synopsis> 12.04.2015