The Power of Computer-Generated Imagery (CGI) in Avengers Endgame Movie: Hyperreality Perspective

[1]Lestari Budianto, [2]Slamet Setiawan, [3]Pratiwi Retnaningdyah, [4]Pijar Krupskaya Barus, [5]Bilqis Aurell Widya Ningsih, [6]Diah Riska Amelia

[1,2,3] Universitas Negeri Surabaya, Indonesia
[4,5,6]SMPU.BP Amanatul Ummah, Indonesia

Abstract
In this modern era, technology plays a very important role in human life. Related to film production, Technology can emerge hyperreality -fiction reality that looks real- to provide a better experience and sensation for the viewers. Avengers Endgame movie is one action movie that uses hyperreality for the effect. This movie is directed by Antony and Joe Ruso. This paper explores the effects of hyperreality that occurs in the superhero team. Bearing the objective of the study, the researcher uses the theory of hyperreality proposed by Jean Baudrillard. In this paper, the researcher used a descriptive qualitative method to explore and explain how hyperreality affected the superhero team in Avengers Endgame. The result shows that CGI technology plays a very important role in creating effects of hyperreality. Superheroes with incredible abilities, places, planets, weapons, and scenes are supported by CGI to enable imagination as an illusion that looks so real in the movie. Many things that do not exist and seem impossible in the real world look so real that it is difficult to distinguish between illusion and reality. That is how hyperreality effects on the Avenger Endgame movie applied.

Keywords
Role of Technology
CGI
Hyperreality
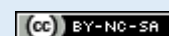
The Power of Computer-Generated Imagery (CGI) in Avengers Endgame Movie: Hyperreality Perspective

Introduction

Technology cannot be separated from human life. Nowadays, People are dependent on technology. Education, politics, entertainment, and so 'on include technology. Therefore, technology plays a very important role in human life (Cascio and Montealegre 2016; Lowe, Dwivedi, and D'Alessandro 2019). In movie production, technology plays an important role (Fang and Xiong 2020; Gran and Gaustad 2021). Technology helps especially when the genre of the movie is science fiction. One of the technologies that are commonly used is CGI (Computer Generated Imagery). CGI is special effects resulting from the use of graphics hardware and software using Maya and 3DS Max (Puspasari, Amizah, and Mahmud 2019). CGI provides a better and more amazing experience for the viewer. It can create special effects as imagination is considered as real that changes over time that cannot be done by a camera or found in human real-life (Chastine and Zhu 2008). CGI was commonly used to generate video game that is familiar among adults and some television programs such as advertisement and cartoon to make them more entertaining for children, portray scenery in films and create hyperreality (Huang 2019).

Hyperreality is the theory proposed by Jean Baudrillard. Hyperreality is effects that can make something beyond reality and modify the simulation to make viewers sure about what they are seeing and listening to (Luthar and Pušnik 2021). It combines reality and illusion real fantasy. Hyperreality does not reflect reality. It's just a model to give a better understanding and experience for the viewers (Bharathi and Ajit 2018). One of the movies that contain hyperreality is Avengers Endgame. The genre of this movie is action and science fiction. Science fiction films have become a favorite genre to watch (Barnett et al. 2006; Levin and de Filippo 2014). This movie is based on Marvel Comics and produced by Marvel Studio. Avengers Endgame is distributed by Walt Disney Studios Motion Pictures. This movie is directed by Antony and Joe Ruso and has been released in 2019.
The existence of hyperreality in this movie is presented when Robert Downey Jr as Tony Stark or Iron Man make friend with Nebula who is a creature from another planet and galaxy. They are flying in the same space plane and do not know where to go since the plane is out of fuel and cannot work properly due to the great damage. Then comes Captain Marvel, a woman superhero that travels along the galaxies to find the plane and brings it to Earth to meet Tony's family and superhero friends. In the story, they lost the previous war with Thanos. Thanos is a man from another planet and galaxy who wants to conquer the world and create his world.

Hyperreality enables the superhero to assemble and use the time machine to travel to the past and surround the world across planets and galaxies to change the condition of the future. The superheroes meet the people and the condition in the past and even they meet themselves. An unexpected thing happened when Nebula that is on the side of superheroes is connected to Nebula in the past that is still on the side of Thanos since Nebula was the creature of Thanos. Through that thing, Thanos finally realizes the reason why the superheroes come from the past. Then Thanos decided to come to the future by the portal and attack the superheroes. Thanos brings all his troops and the war happens again. But this time, the superhero team is better since they have more troops and help from captain marvel that did not participate in the last war. Finally, the superhero team won the war and could save the world.

The situations and conditions in the movie are the effects of hyperreality supported by CGI technology to make the movie looks so real. It is related to Baudrillard's theory of hyperreality which makes the image looks so real. Therefore, Avengers Endgame was chosen to be an object of analysis. To give a clear understanding of hyperreality and its effects, the researcher limits the research to the Avengers Endgame movie.

Method

The approach of this research is qualitative. It is a research approach that highlights how theories were generated (Collins and Stockton 2018). While the method of this research is descriptive qualitative. It was chosen to identify, analyze, and describe the data (Asrifan et al. 2021). The data of this research were the movie and the transcript that focused on the effects of CGI and hyperreality in the Avengers Endgame movie by Antony

and Joe Ruso. The data were analyzed by watching the movie and reading the transcript by using the perspective of hyperreality comprehensively (Fauzi and Pradipta 2018; Nassaji 2015). The data was then presented in the result of the research after being analyzed.

Results

Hyperreality in the Characters and the Actions

Avengers Endgame movie is an action and science fiction movie that has been released in 2019. The story is about a superhero team trying to save the world. The war between the superhero team and villain team happened across planets and galaxies. In this movie, hyperreality exists in the characters and the actions. The characters and the actions are supported by CGI technology to create hyperreality. The characters and the actions are not existing and are possible to be done in real life. Hyperreality supported by CGI technology enables the characters and the action to have appeared. The characters and the actions also look so real even if it is not real but it is considered real in the Avenger Endgame movie.

Ironman
One of the superheroes is Ironman. Ironman is a superhero with a super costume made of iron and equipped with many amazing features. With his costume, Tony Stark as Ironman can fly, shoot, and even stop the meteor that is going to hit his planet. Ironman is a billionaire man. He lives on planet Earth. He is very smart and talented. He uses his wealth to create many amazing weapons. He stays in his amazing house. In his house, he has amazing technology. Everything is almost automatic. He has many luxurious cars, robots, and other advanced tools that help him do everything.

Ironman with other superheroes on planet Earth like Captain America, Ant-Man, Hulk, and others always tries to keep the peace on planet Earth. They fight with villains on planet Earth even villains coming from other planets and galaxies. In Avengers Endgame, Tony Stark as Ironman successfully fight and beat Thanos as the villains' boss. Ironman successfully grabbed the magic gloves equipped with all the infinity stones. After grabbing the gloves, Ironman uses them to change the condition and make it normal without war. After using it, the world condition becomes so peaceful but he dies. In another world, Ironman sacrifices his life to save the world.
In Avengers Endgame movie, hyperreality is supported by CGI technology that provides an illusion to be accepted as reality. CGI technology creates an illusion that makes ironman amazing. He can travel everywhere, fighting monsters from other planets with the weapons on his iron costume, beating the villains' boss, and saving the world.

Captain Marvel
Another hyperreality supported by CGI technology is captain marvel. Captain Marvel is a female superhero that travels across the planets and galaxies to keep the world in peace. She is very strong and able to destroy everything with her superpower. She crushes her body on the enemy space planes to destroy them. Her name in the movie is Carol. Carol is working in the air force. One day, he flies a plane with her partner namely Walter Lawson.

They fly the airplane together but suddenly the plane explodes and they fall but are still alive. Fortunately, Carol is okay but Walter Lawson is extremely injured. Here is the fact that Walter Lawson is not an ordinary woman. She brings special tools from the Kree clan. Kree is a clan from another planet and galaxy. Some Kree creatures come to Carol and Lawson to get the tool. When the Kree creature shoot Carol, it hits the special tool and makes it explode. The explosion of the tool changes its DNA of Carol. Because of that, Carol has a superpower from the Kree clan but she is still human. This is how Carol gets her superpower as Captain Marvel.
Carol can travel and surround the world across planets and galaxies. She has a light covering her body and it makes her able to crush everything she crosses. In Avengers Endgame, Carol with other superheroes fights Thanos as the boss of the villain. Carol's superpower and actions are simulated by CGI technology to create hyperreality. It is not real but considered as reality in the movie.

Valkyrie
Valkyrie is also affected by hyperreality supported by CGI technology. She is a female soldier that rides a Pegasus -a horse that can fly- to participate in the war. Valkyrie can destroy many enemies with her sword and ride Pegasus. Those superpowers of the superheroes are the effects of hyperreality supported by CGI

technology since in the real life, they cannot do those things but viewers consider those things as reality in the movie.

Valkyrie, portrayed by Tessa Thompson is a goddess from Asgard planet. This planet is a place where gods and goddesses live peacefully in eternal life. Valkyrie is a superhero that participates and helps other superheroes in the final warfighting against Thanos. Valkyrie rides her flying horse namely Pegasus. With her horse, Valkyrie destroys many enemies' planes with her sword. Hyperreality in Valkyrie's character can be seen when she rides Pegasus. In reality, there is no horse with wings and horns. With the support of CGI technology, Pegasus is equipped with wings and horns to help Valkyrie participate in the final war. Even though that character is just imagination and illusion, it is considered real in the movie. This is how hyperreality is applied in the Avengers Endgame movie.

Hyperreality in the Time Machine

In the Avenger Endgame movie, the time machine supports hyperreality to appear. In the real world, people cannot go to the past or travel across periods but in that movie, with the time machine of a superhero Ant-Man, the superheroes can travel to the past and use the chance to make a difference in the past to change the future. Using the time machine, the superheroes are successful to arrive in the past and it makes 2 realities since they meet themselves. For an instant, when Captain America traveled to the past to get the infinity stone, he met himself and fought himself to get the stone. That is the effect of hyperreality where someone from the future could travel and meet himself in the past. This illusion and imagination are considered a reality in the movie.
An unexpected thing happened when the superheroes' plan was known by Thanos as the boss of the villains. Thanos realized that the superheroes traveled to the past to collect the infinity stones and beat Thanos. Even if the superheroes were successful to collect the infinity stones to change the future, they still got big problems because when they wanted to come back to the future, Thanos and the troops also used the technology and the portal to reach the future. Thanos and the troops were successful to reach the future. He then started the war with the superhero team. The portal is the effect of hyperreality that makes people from the past go to the future. In reality, there is no portal like that. The scene is supported by CGI and that makes the image looks as real as hyperreality.

Hyperreality in the Locations

Planet Titan
Planet Titan is the home of Thanos a supervillain in the Avengers Endgame movie. Planet Titan is not a planet. In real life, that is the satellite of planet Saturn. It is a moon and there are no living things there. In the movie, Planet titan is the planet of eternal creatures. People call them Titanian and Thanos is one of Titanians. In the movie, Planet titan is overcapacity. There are too many civilians and the food and resources seem to be not enough in the future. Seeing that, Thanos has a plan to dismiss half of the world's population so the resources for living will be enough for everyone. He then travels across planets and galaxies to collect infinity stones and with the power of the stones, he can dismiss half of the world population. Planet Titan is affected by the technology of CGI which makes it different from Titan in the real life. The effect of CGI technology on Titan is to create hyperreality to make the movie more interesting even if it is just an illusion.

Planet Vomir
Planet Vomir is one of the things affected by CGI technology to create hyperreality. Planet Vomir is a place of soul stone -one of the infinity stones- that is Thanos looking for. In the Avengers Endgame movie, Thanos was struggling to collect all the infinity stones to dismiss half of the world's population. In real life, planet Vomir is in Lencois Maranhenses National Park in Brazil. In the movie, if someone goes to planet Vomir, the one will not get out of the planet unless the one gets the soul stone. How to get the soul stone is not easy because one should sacrifice the most beloved person of his or her life. In the movie, Thanos goes to planet Vomir with Gamora and sacrifices her. Thanos finally gets the soul stone and gets out of planet Vomir. Here, the effect of CGI technology creates hyperreality on planet Vomir. The appearance of the National Park can be displayed as a very silent planet. The scary aura can be seen in the movie. Even that is not real but the illusion looks and is considered a real planet in the movie. That is how CGI technology support providing hyperreality to make the movie looks amazing and interesting.

Discussion

The use of CGI technology in the film world has had a huge impact (Morie 1998). The effects caused by the technology can make the film more interesting (Han 2016). Something fictional looks and sounds like reality throughout the film. With this technology, films are edited to create extraordinary animations that are very satisfying to watch (Schulz et al. 2021). With the impression of visualization that is very visible as a reality, the CGI effect can form a hyperreality.

The hyperreality that appears in the Avengers Endgame movie is seen in several things, including those seen in the superhero characters in the film and their actions. In the film, superhero characters seem to exist in this real world when in fact they do not exist in this real life. The superheroes are also able to do extraordinary things where these things are impossible to do in the real world, but in the film, it feels so real in this world. The hyperreality effects made something unreal was considered real (Ekawardhani et al. 2020). That's the CGI effect that creates a hyperreality.

In addition to the characters and actions, the hyperreality created by CGI effects is also seen in an equipment called a time machine. In reality, there is no time machine, but in this film, superheroes use a time machine to return to the past to change destiny in the future. The appearance of the time machine looks so real with CGI effects that it forms a hyperreality.

Not only superhero characters and their actions and time machines, the CGI effects that makeup hyperreality are also seen in the location settings in the film. The locations edited using CGI effects that make up the hyperreality are Planet Titan and Planet Vomir. In reality, the two planets are not real but in the film, they look very real with the details. This is proof that planets that are not real in real life look so very real with CGI effects. In this film, the audience is presented and brought into a hyperreality where many aspects that seem very real are not real in real life (Martadi 2003; Michelle et al. 2017, 2017). This is done by using CGI effects in the process of making the film. The use of CGI has become a trend in the film industry (Mahale 2021). The goal, of course, is to make the film much more interesting to watch.

Conclusion

CGI is a technology to create an illusion based on imagination in a movie. CGI in the Avengers Endgame is used to support hyperreality to make the movie looks so real. Many things in the movie were supported by CGI such as the superheroes with their incredible abilities, places, weapons, planes, and many more. CGI technology makes the science fiction movie looks so real and presents hyperreality in the Avengers Endgame movie.

Bearing the findings and discussions of this research, the researcher concluded that the Avengers Endgame movie contains hyperreality. The hyperreality of this movie was created by CGI technology. CGI technology enabled the superheroes to do many incredible things such as flying, destroying meteors, transforming into tiny and giant bodies, creating a time machine, traveling across planets and galaxies, and many more. Those abilities are only imagination and considered fiction but because of the CGI, those abilities look so real.

The abilities of the superheroes are not only proofs of the existence of hyperreality in this movie. The places and locations are also an example of hyperreality that is supported by CGI technology. CGI technology-enabled illusion based on imagination to create new places that are different from reality. For instant, planet Vomir and planet Titan. Those planets look so real even not exist in real life. with the support of CGI, those planets are considered real planets.

This research focused on analyzing the application of computer-generated imagery (CGI) in a movie entitled Avengers Endgame using the perspective of hyperreality. It is suggested for further research to conduct similar research with different perspectives and movies.

Acknowledgment

References

Asrifan, Andi, Harun Abdullah, Muthmainnah Muthmainnah, and Atul Patil. 2021. "An Analysis of Code Mixing in the MOVIE 'From London to Bali.'" *ENGLISH FRANCA : Academic Journal of English Language and Education* 5(2):317. doi: 10.29240/ef.v5i2.2619.

Barnett, Michael, Heather Wagner, Anne Gatling, Janice Anderson, Meredith Houle, and Alan Kafka. 2006. "The Impact of Science Fiction Film on Student Understanding of Science." *Journal of Science Education and Technology* 15(2):179–91. doi: 10.1007/s10956-006-9001-y.

Bharathi, Susee, and I. Ajit. 2018. "Hyperreality as a Theme and Technique in the Film Truman Show." *Global Media Journal* 16(30):1–5.

Cascio, Wayne F., and Ramiro Montealegre. 2016. "How Technology Is Changing Work and Organizations." *Annual Review of Organizational Psychology and Organizational Behavior* 3(June):349–75. doi: 10.1146/annurev-orgpsych-041015-062352.

Chastine, Jeff, and Ying Zhu. 2008. "The Cost of Supporting References in Collaborative Augmented Reality." *Proceedings - Graphics Interface* 275–82.

Collins, Christopher S., and Carrie M. Stockton. 2018. "The Central Role of Theory in Qualitative Research." *International Journal of Qualitative Methods* 17(1):1–10. doi: 10.1177/1609406918797475.

Ekawardhani, Yully Ambarsih, Imam Santosa, Hafiz Azis Ahmad, and Irfansyah Irfansyah. 2020. "Modification of Visual Characters in Indonesia Animation Film." *Harmonia: Journal of Arts Research and Education* 20(2):167–75. doi: 10.15294/harmonia.v20i2.22556.

Fang, Jingxuan, and Wei Xiong. 2020. "Impact of Digital Technology and Internet to Film Industry." *IOP Conference Series: Materials Science and Engineering* 768(7). doi: 10.1088/1757-899X/768/7/072112.

Fauzi, Ahmad, and Ika Wahyu Pradipta. 2018. "Research Methods and Data Analysis Techniques in Education Articles Published by Indonesian Biology Educational Journals." *Jurnal Pendidikan Biologi Indonesia* 4(2):123–34. doi: 10.22219/jpbi.v4i2.5889.

Gran, Anne Britt, and Terje Gaustad. 2021. "Digitizing Cinemas–Comprehensive Intended and Unintended Consequences for Diversity." *Journal of Arts Management Law and Society* 52(2):101–16. doi: 10.1080/10632921.2021.2018374.

Han, Xiao. 2016. "Research on Computer Digital Means of Film Post-Production." 50(Iceeecs):149–52. doi: 10.2991/iceeecs-16.2016.33.

Huang, Yan. 2019. "The Construction of Hyper-Reality of Advertisement in Consumption Culture." *Journal of Asian Research* 3(2):p190. doi: 10.22158/jar.v3n2p190.

Levin, Luciano Guillermo, and Daniela de Filippo. 2014. "Films and Science: Quantification and Analysis of the Use of Science Fiction Films in Scientific Papers." *Journal of Science Communication* 13(3). doi: 10.22323/2.13030207.

Lowe, Ben, Yogesh Dwivedi, and Steven Peter D'Alessandro. 2019. "Customers and Technology in A Changing World." *European Journal of Marketing* 53(6):1038–50. doi: 10.1108/EJM-06-2019-966.

Luthar, Breda, and Maruša Pušnik. 2021. "Intimate Media and Technological Nature of Sociality." *New Media and Society* 23(5):1257–77. doi: 10.1177/1461444820912387.

Mahale, Jayesh Manohar. 2021. "The Recent Trends of VFX (Visual Effects) & Animation in Indian Film Industry." 10(03):380–81.

Martadi. 2003. "Hiper-Realitas Visual." *Nirmana* 5(1):80–95.

Michelle, Carolyn, Charles H. Davis, Craig Hight, and Ann L. Hardy. 2017. "The Hobbit Hyperreality Paradox: Polarization among Audiences for a 3D High Frame Rate Film." *Convergence* 23(3):229–50. doi: 10.1177/1354856515584880.

Morie, Jacquelyn Ford. 1998. "CGI Training for the Entertainment Film Industry." *IEEE Computer Graphics and Applications* 18(1):30–37. doi: 10.1109/38.637268.

Nassaji, Hossein. 2015. "Qualitative and Descriptive Research: Data Type versus Data Analysis." *Language Teaching Research* 19(2):129–32. doi: 10.1177/1362168815572747.

Puspasari, Cindenia, Wan Amizah, and Wan Mahmud. 2019. "Diffusion Innovation in Movies Development: Computer Generated Imagery." *International Journal on Social Science Economics & Art* 2(March):28–32.

Schulz, Anne, Amelie Eder, Victor Tiberius, Samantha Casas Solorio, Manuela Fabro, and Nataliia Brehmer. 2021. "The Digitalization of Motion Picture Production and Its Value Chain Implications." *Journalism and Media* 2(3):397–416. doi: 10.3390/journalmedia2030024.