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TECHNOLOGICAL ADVANCES IN DEJAVU MOVIE

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Abstract:
The purpose of this study is to find out about technological progress in the film that explains and represents technological progress in the movie Dejavu, namely the development in the scheme and story containing the Theory of Relativity previously proposed by Albert Einstein. This is in several explanations and interpretations of logic, namely the proof of the representation of space and time with electromagnetic wave tools, which are widely available in our environment, although sometimes less realized, for example, an instrument that occurs every time we travel either on foot or by using a vehicle, then the acceleration produced will also be different in space and time. That is an example of an instrument that will be explained through a film work. This research method uses a descriptive qualitative method and uses the Theory of Relativity consisting of Acceleration Relativity, Time Expansion, Lorentz Contraction, and Mass and Energy Relativity. Based on the results of this Dejavu movie research, it can explain in detail how an object can move from one place to another, with a percentage connecting the Theory of Relativity with this Dejavu movie, it is concluded that Acceleration Relativity has 8 scenes (65%), Time Expansion has 3 scenes (15%), Lorentz Contraction has 2 scenes (10%), and Mass and Energy Relativity has 1 scene (5%). Acceleration relativity is present in certain accelerations although from science there are still some things that are still under development, in addition to technological advances based on CGI (Common Gateway Interface) which is a benchmark for combining technology in a film so that the understanding that is done can be conveyed clearly and realistically.

Keywords:
Relativity; Technology; Film

INTRODUCTION

Before the general theory of relativity was introduced by Einstein in 1915, we knew at least three laws of motion, namely Newtonian mechanics, special relativity, and Newtonian gravity. Newtonian mechanics was very successful in explaining the nature of the motion of low-speed objects. However, this mechanism failed for objects whose speeds approached the speed of light. This deficiency was covered by Einstein by proposing the special theory of relativity. This theory successfully explained the phenomenon of objects when they moved close to the speed of light. Newtonian gravity

applies to weak gravitational fields. Einstein repeatedly tried to formulate a theory of gravity that was consistent/compatible with the special theory of relativity, and in 1915 produced the general theory of relativity. He put forward a fairly revolutionary suggestion that gravity is not like other forces, but gravity is an effect of the curvature of space-time due to the distribution of mass and energy in that space-time. With a new concept, the general theory of relativity provides a new view of space-time. The concept that space-time can be curved if there is massive matter in it provides several new implications. In addition, the general theory of relativity also presents the idea of gravitational waves that arise due to the movement of massive matter in space-time. One of the quite spectacular implications is the emergence of the idea of black holes that are limited by the event horizon, where all events that occur within the event horizon cannot be observed from the outside. A black hole is a mathematical concept that arises from the solution of Einstein's gravitational equations with physical properties. Black holes are the most exotic natural phenomena found in physics today. Black holes are caloric machines that follow the laws of thermodynamics, which have temperature and therefore also have entropy.

Entropy is a measure of information loss and a measure of disorder associated with heat. In a closed space and isolated system, the entropy always increases and never decreases (Harrison, 2012). In 1916 Karl Schwarzschild solved Einstein's field equations in vacuum for a charged spherical coordinate system and his solution is known as the Schwarzschild solution, which shows the simplest type of black hole, the Schwarzschild black hole which is only determined by a single parameter, the mass M. Black holes are largely based on the general theory of relativity. About 48 years after Einstein, in 1963, Kerr found an asymmetric solution to the vacuum equations, where it was later realized that the rotating *black hole* can be studied using the metric for the charge of rotating black holes (i.e. black holes characterized only by m and J), the geometry is given by the Kerr metric presented in Boyer-Lindquist coordinates, (Hoyng, 2006). Therefore, researchers are interested in analysing the rotation of black holes using the Kerr Metric in Boyer-Linquist coordinates.

One of the several concepts of physics can be introduced in several plots, for example, the Science Fiction film, which is a popular genre that has been widely adapted into works of art, especially in literature and film. This genre is an imaginative thought about alternative human lives that are connected to the development of fictional technology. The general thought that arises from this genre is human life in the future, with technology that has developed far beyond the technology that exists today. The technology that is often imagined in this genre is vehicles for traveling between planets, tools to penetrate space and time, robots with artificial intelligence, sophisticated weapons such as laser guns, rapidly developing means of transportation such as teleportation and anti-gravity cars, and perfect urban systems.

One of the media used in various technologies shown in science fiction works is the interface display (*interface*), which can connect humans with the tools they use. Looking at the science fiction films produced in this decade, such as Iron Man (2008) and Dejavu (2006), it can be seen that the role of the interface display provides a unique attraction to the technology used.

To use technological equipment, since ancient times, in the early days of technological development, humans have needed a touchable interface to operate the equipment. For

example, it can be seen from simple technology such as a stick, where humans must hold the stick to function, either as a walking aid or to defend themselves. To produce fire, humans need to hold stones or wood to rub together. In more advanced developments, humans created wheels and used them to make strollers or carts pulled by animals, which, of course, require control. At present, in the early 21st century, humans still need interfaces such as steering wheels to drive cars, buttons to operate machines, or the use of applications to make digital equipment function. The same thing applies to technological equipment used in science fiction works, that to use sophisticated technology, even though it is only fiction, an interface is still needed so that what is displayed seems reasonable. With this article, the author intends to review how the development of human interfaces and science fiction technology affects the development of technology in the real world and vice versa, then question whether the fictional technology is relevant to be created in the real world.

As a start to studying the connecting devices for controlling technology, we will look at the history of science fiction films, which as a start will refer to what is considered to be the first science fiction film, namely Le Voyage dans la lune by Georges Melies in 1902. This film is a depiction of futuristic life that was imagined at the beginning of the development of cinema, where humans successfully travel to the moon.

Here, it is shown that the vehicle used is a rocket that is fired using a cannon towards the moon. The interesting thing here is that there is no control to operate the equipment used. There are no buttons or levers to operate the cannon or equipment in the rocket cockpit. The only effort made to make the equipment work is to light the fuse on the cannon. Understandably, this film was produced in the early days of the development of cinema, when the boundaries between film art and theatre art did not yet exist. Georges Méliès himself was a stage magician, so it is not surprising that his work was greatly influenced by theatre action. Another interesting thing about this film is the appearance of scientists who look like magicians. It should be noted that at the time this film was made, the known controllers were mechanical controllers, such as levers, hinges, or buttons. These controllers, although they have been discovered, have not become everyday items.

The situation changed in the 1920s and 1930s, when the use of electricity became more common and equipment such as buttons and switches became more widely known, thus influencing the films that were made. During this period, also known as the industrial era, technology users used a mechanical cause and effect system, which is simply when we press a button or pull a lever (cause) from a machine controller, it will cause a reaction from another machine.

With the development of technology, both those that appear in daily activities and those that are limited to use by certain parties, such as the military, also contribute to the development of equipment displayed in science fiction films. World Wars I and II have contributed greatly to the development of the interface for science fiction technology. With the war event, public knowledge about war technology developed through people who were assigned to the military and shared their experiences about military equipment. One example of influence is in the Buck Rogers series in 1939, where in the scene on the battleship, buttons have been shown as machine-operating equipment, and here they

already have the technology to see the display from another ship with a screen, which resembles a television today.

Science is scientific knowledge that is explored and based on truth or reality alone. Its nature is systematic (regular) and can be proven true. Science is a prerequisite for realizing one of the purposes of the creation of this nature, namely, for the benefit of humans. However, science is given to humans through human activities themselves to understand this nature, including time.

Time is a paradox, in the sense that everyone is aware of time, but no one can define it. This paradox arises from another, more fundamental paradox, the paradox of the relationship between time, space, and motion. Time is measured by motion in space, including the motion of the Earth rotating on its axis or its motion around the sun. But motion itself is measured by time and space because explaining the motion of a planet or atom, for example, means determining the change in its position when viewed in the dimension of time. For example, people measure distance in light years. One light year is the distance travelled by light in one year.

As one of the major changes in physics, the theory of relativity. The theory of relativity is a theory that is widely implemented in many ways. The general theory of relativity brings major changes in the history of science in understanding the universe. However, this theory was not born just like that. The achievements of science do not come suddenly, but rather the result of a long journey that has been built by predecessors. Many types of relativity theories were developed by inventors, especially Albert Einstein, who expressed the opinion that Albert Einstein was the scientist behind this theory, where he published the first part of this theory, namely the special theory of relativity, in 1905. The special theory of relativity refers to two concepts:

1. ***The laws of physics apply to every object in all frames of reference moving at constant velocity with respect to each other; that is, the form of the physical equations will always be the same even when observed in motion.***
2. ***The speed of light in a vacuum is always the same for all observers and does not depend on the motion of the light source or the observer (light travels at c = 300,000,000 m/s).***

Einstein showed that no object with mass can travel at the speed of light. In addition, Einstein's theory of relativity above resulted in changes that are somewhat different from our everyday experiences, such as:

1. Acceleration Relativity
2. Time Expansion
3. Lorentz contraction
4. Relativity of Mass and Energy

A decade later, Einstein published the second part of his general theory of relativity. Namely: ***The general theory of relativity is a theory of gravity.*** In Newton's statement, gravity is an invisible force that attracts objects to each other, but in general relativity, gravity is the curvature of space-time caused by the mass of an object. The heavier an object, the greater the curvature of space-time it causes. This curvature affects time; the

greater the gravity, the slower time passes in the curvature of space-time. A decade later, Einstein published the second part of his theory of general relativity.

This theory indirectly provides an example of how this can affect the concept that was previously implemented straightforwardly, precisely and flexibly, and which is widely used as a concept is the general theory of relativity. Why is that, because this theory is very interesting to apply in various ways, such as in a film.

Film is a creative work of art that has various artistic elements to fulfil spiritual needs. So, in making a story film, it must go through a thought process and a technical process, namely in the form of searching for ideas and story ideas. While the technical process is in the form of artistic skills to realize all ideas, concepts or stories to become a film that is ready to be watched.

As for the definition of film according to experts, Kridalaksana (1984:32) ***The definition of film is a mass media that has audio-visual properties, which can reach a large audience.*** Meanwhile, according to Michael Rabiger, ***the definition of a film is that it is entertaining and interesting, so that it can make the audience think more deeply.*** The film genres that you should know are, Horror, Romance, Drama, Thriller, Colossal, Comedy, Action, Mystery, *Sci-Fi* (*Science Fiction*), and fantasy.

Many people can easily grasp the message of a film. But many also have difficulty with this matter. Especially those who watch only for entertainment purposes. Many criticize people who analyse films because they think this is a waste, and the film is not enjoyed at all. This is not wrong, because everyone has the right to determine in their way how they will process a film, such as one of them by enjoying a film without thinking too seriously about the meaning of the message behind it. However, it is wrong to say that by analysing a film, someone cannot enjoy the film at all. If we are willing to try to understand, interpret a film and open our minds, films can provide information and educate, and even inspire.

Film *Sci-Fi* (*Science Fiction*) so many influences are displayed in the form of imagination that sometimes exceeds the limits of human reason, and perspectives from various angles show the great need to apply science, especially those based on certain theories, such as the theory of relativity. This idea is poured into the Deja Vu film by Director Tony Scott and Producer Jerry Bruckheimer, which was produced in 2006. It tells the story of Doug (Denzel Washington), who is a member of the ATF. Namely, one of the police investigation bureaus, a very intelligent person, a figure who has almost no personal life, dedicates his life to the police. This time he investigates the Born tragedy that killed 543 people on a navy ship that was celebrating Navy SEAL military education students, not only that, another victim was Larry, Doug's colleague and friend, who was very close and considered a brother by Doug. Unusually, this time Doug's investigation was introduced to a truly sophisticated technology, a super sophisticated installation that can provide a visual depiction of all events, anywhere, anyone, for a maximum of 4 1/2 days ago, he can visualize the past.

With the tool, TF detectives can see can hear anyone's conversation to find traces of the bomber, until they arrive at the investigation of the owner of the van used by the perpetrator to hide Born, a van owned by a woman named Claire (Paula Patton). Claire was also examined through the sophisticated tool, starting from what she heard, what she saw, and who contacted her. Initially, A TF agent believed Claire had died with Born, but the motive and who were still not revealed.

During the investigation, there was something strange that Doug suspected, namely that Claire felt that someone was watching her, but the ATF agents had looked around Claire and found no one. Doug began to suspect that Claire felt that someone was watching her and that it was them (ATF investigators).

The longer this sophisticated device makes Doug more curious, he casually highlights the device screen with a laser beam, and boom!, all electricity and systems go out, after it turns back on and the device is stable, Doug gets angry because he feels fooled, he asks for an explanation from the IT experts at the ATF who are there, they explain that the device is not just a visual display from the past, but a mini time machine, which is connected to the present at the same time, Doug forces the IT team to do more, and then it is agreed to send a memo to Doug the day before the bomb is detonated, with the help of a material transfer tube, they manage to send it to Doug's desk, but unfortunately, the memo is read by Larry and leads him to his fate.

Doug and the IT A TF team felt guilty, because the memo was the cause of Larry's death by the born perpetrator. Doug still didn't want to give up; he felt he shouldn't stop because he had caused Larry's death, but at this time, he was able to prevent more victims, namely the navy students. Doug also tried to send himself to the past to prevent and save the victims, including Claire, who turned out not to be the perpetrator. But unfortunately, Doug died because he was unable to save himself from the boat that he threw into the sea. After all, he chose to save Claire.

But they don't be sad yet, remember that it wasn't Doug at that time? There were 2 Dougs at that time, there was Doug from the future and there was Doug from the same time as Claire, and Doug from the future had died, but he managed to save Doug in Claire's time, and will continue to live because there was no birth, no victims, but maybe Larry was the one who couldn't be helped.

The Dejavu film emphasizes the theory of relativity itself, where there is Space and time that are closely connected and intertwined: when space bends or stretches, it will affect time. While the bending or stretching of space-time causes gravity in the universe. Einstein considered space and time to be intertwined like an infinitely long 'blanket'. A large object like the Sun can bend the 'blanket of space-time' with its gravity, so that light no longer moves in a straight line when passing through the Sun. Every bit (the smallest unit) of matter, including humans, can bend the space-time around it, creating its gravity even though it is very small. However, gravity only works in space and on flat planes. Although it is not yet known for sure, various researchers are currently continuing to develop this theory with what we can call a Black Hole (*Black Hole*)

METHOD

The approach is a way of looking at the object of study to be studied. The process in this study uses a general approach as used is a qualitative descriptive approach. According to Bodgan and Taylor who are based on Meleong in Faradila (2017:21), qualitative methods as research procedures that produce descriptive data, meaning that data is broken down in the form of words, or images, not in the form of numbers.

The data obtained by the researcher in this case is a scene in the Dejavu film related to the concept of physics. The library data found is ready to use and comes from the main object of the study, namely, the fictional film Deja Vu, or research results. The data is permanent and does not change (Zed, 2008:4-5). The researcher analyses and explains the scientific phenomena involved in the Dejavu film based on the concept of physics, which is relevant to physics books.

Research Techniques

The approach technique that will be studied is the content analysis approach. This analysis approach is taken to obtain information from the contents of the film, especially regarding the time tunnel in the film Deja Vu. This analysis approach can be used in all forms of communication, including newspapers, radio news, television news, and other forms of documents. In line with technological advances, in addition to manual methods, computers are now available to facilitate the content analysis research process. In this study, the author uses a literature study technique or *library research* to analyse the cultural values contained in Jerry Bruckheimer's film Deja Vu. Therefore, the author takes the following steps:

1. Watching the movie Deja Vu on repeat.
2. Classifying data by capturing scenes that are considered to represent scientific phenomena in the film Deja Vu.
3. Identifying scenes related to technological advances, especially the general theory of relativity.
4. Analyse the results that have been identified using the theory of relativity developed by Albert Einstein.
5. Reading theory books related to research.
6. Making conclusions from the research that has been conducted

Awalina and Purwoko (2018:2) stated that "Literature research is a data collection technique by conducting a review study of books, literature, notes, and reports that are related to the problem being solved". It can be concluded that library techniques are an effort to collect data by conducting a review of books, notes, literature, and reports that are relevant to the focus of the research.

Focus and Sub focus

The focus of this research is to analyse research on the film Dejavu by Jerry Bruckheimer. The sub-focus of this research is to analyse technological progress in the film Dejavu which is basically a science fiction film. In analysing this research, the author uses the theory developed by Albert Einstein regarding the General Theory of Relativity which is the benchmark for current film technology.

The sub-focus in this study uses the library method, which is a way of collecting data by searching for data on things in the form of information from various sources that focus on library collection materials only, without requiring field research. There are so many types of library collections, books, journals, and films. The data obtained in this study are scenes in the Dejavu film related to the concept of the Theory of Relativity developed by Albert Einstein; the library data found is ready to use and comes from the main object of the study, namely the fictional film Dejavu, or research results. The data is permanent and does not change. In this study, the sub-focus is also based on primary and secondary data. The documents mentioned in the primary data sources and secondary data are read, then understood, and then the data needed to answer the formulation of the problem in this study is obtained.

Primary data is data that is directly obtained from the source, observed, and recorded as the main basis for research. While secondary data is data that the researcher attempts to collect themselves. The data sources used by the author include:

1. The primary data source is the film Dejavu
2. Secondary data sources are Einstein's Cosmology (1996) written by Joko Siswanto, Modern Physics Concepts (1987) written by Arthur Beiser, Einstein's Theory of Relativity (2010) written by Albert Einstein, General Relativity (2006) written by Hobson and Film as Learning Media (2013) written by Teguh Trianton.

Research Instruments

Research instruments are tools used by researchers to collect research data. In qualitative research, humans (*Human Resource*) or the researcher themselves become a tool to collect the data needed for research. So, the main instrument in this study is the author himself and the film script, using a helper table to analyse the type of language style. The helper label format for this study is as follows:

Table 1 Values of the Theory of Relativity Conveyed in the Film DeJavu

NO	INFORMATION	SCENE	RESULT
1			
2			
3			

The theory of relativity itself has been tried by many people to solve several causes and effects, so that it can be told and exemplified in science fiction films, so that we can indirectly understand what the film is saying.

Data Recording Techniques

In recording data in this study, the author used a technique in the form of the following steps:

1. A careful reading of Jerry Bruckheimer's film Deja Vu.
2. Note the parts that contain elements of the Theory of Relativity concept shown in the film Deja Vu.
3. Analyse the results that have been recorded based on the theory of the concept of General Relativity.
4. Drawing conclusions based on the results of the analysis

Data Validity Checking Techniques

The author determines the film Deja Vu by Jerry Bruckheimer as a research source and has obtained approval to be analysed as a requirement for writing a thesis. In this study, it is necessary to check the validity of the study data to support the significance of the data findings. To measure the validity of the data in this study, the author uses semantic validity, namely by seeing how far the existing data can be interpreted according to its context; and validity *expert judgment*/ expert opinion, namely by researchers consulting with lecturers who are experts in the field being researched.

RESULTS AND DISCUSSION

Results

This chapter describes various things about the results and discussions of research in the form of the concept of technological progress in films related to physics, which indirectly has a relationship with the theory presented by Albert Einstein. Namely, the theory of relativity, which until now is still being debated, and the results are still in an imperfect state. The film Dejavu is one example, which is why this film is intended, because this theory is indeed very interesting to discuss.

This Dejavu film is very thick with the science of relativity, in several scenes it is explained that this theory can be done by creating a kind of "time tunnel" so that something that is not large can move dimensions through space and time, can go to the past. The beginning of this film is told when there was a bomb terror on a large cruise ship carrying quite a lot of passengers, especially American marines (US Navy) who at that time were going to return to their respective regions. This Bomb Terror killed more than 90 percent of its passengers, until an American Transportation Safety (ATF) agent came to investigate this case and indirectly joined a special team to carry out the mission, and they have a tool that can do "teleportation.

Generally, Deja vu is something that subconsciously reminds us of having done an activity or event, such as going to the same place or doing something. Previously, usually recurring conditions or a supportive environment, because dreams for example. However, this research focuses on the process of transfer through space and time. Because, as we know that incidents like this do happen a lot in our environment. For example, if we compare walking and using car transportation for example. Indirectly, in space and time, the difference is very significant because it is faster to arrive using car transportation than walking. This is one small example that needs to be realized.

Related to the theory of relativity itself, until now, many have tried to solve several provisions that are quite difficult to accept logically, especially with the advancement of technology today. How to convey knowledge in the form of a film. Based on this study, there is also a percentage of several scenes or conversations related to the Theory of Relativity proposed by Albert Einstein. The percentage is as follows:

No	Information	Scene	Results
1	Acceleration Relativity	Electromagnets are used as the main tool for interacting with moving objects.	There are 8 scenes

2	Time Expansion	Movement of objects from one place to another with equal time	There are 3 scenes
3	Lorentz contraction	Shrinkage of an object when it is moved through time dilation	There are 2 Scenes
4	Relativity of Mass and Energy	The mass of an object observed by a stationary observer will be different from the mass of an object observed by an observer moving at a certain speed.	There is 1 Scene

From the Percentage above, it can be concluded that from the Theory, there are indeed scenes and conversations that directly lead to Relativity. This can be calculated based on concrete results after research, namely, Acceleration Relativity has 8 scenes (65%), Time Expansion has 3 scenes (15%), Lorentz Contraction has 2 scenes (10%), and Mass and Energy Relativity has 1 scene (5%). Thus, this film can explain the Theory of Relativity.

In theory, this was initially only done for reasons of greater security for a country, especially the United States. However, with an incident like this, it can be a justification that the theory of relativity proposed by Albert Einstein was tried to be implemented in real form. Black holes (*blackhole*) are a condition where space and time can meet. So that it produces great energy that aims to "move an object from one place to another. But that doesn't mean that ha! Like this can run easily, but many risks and consequences are faced, one example of which is opposing the will of Destiny (God).

The function of this sophisticated technology, although only found in films, especially the Dejavu film, can provide information that relativity occurs a lot in everyday life, where, if we realize it, it can repeat itself at one time. The Dejavu film tries to implement the theory contained in the work that the concept of space and time acceleration can be done, even though in reality it is very little or almost impossible to realize. Therefore, the film is a manifestation of the dreams of scientists, whether this theory can be explained perfectly with human logic.

Discussion

Albert Einstein 1905 shook the world of science with his theory of relativity. At that time, time was considered absolute anywhere and anytime, but Einstein thought that time and space were not absolute but relative. Einstein expressed his special theory of relativity in two postulates. The first postulate, "The laws of physics are the same and have the same form in all inertial reference frames The first postulate of the special theory of relativity states that the laws of physics will always apply to any reference frame. Reported to Physics LibreTexts, an inertial frame is defined as a frame that is held by Newton's law of inertia. According to Newton, an object at rest will remain at rest if it is not affected by any external force. Likewise, an object in motion, the object will continue to move at a constant speed if no external force acts on it. In objects moving at speeds close to the speed of light, time, mass, and length will be relative. Where the time felt by a stationary observer will feel longer, the mass becomes heavier, and the length will be shorter (Lorentz contraction) when compared to that seen by a moving observer. Reported from the University of Pittsburgh, the first postulate states that absolute motion cannot appear in any law of physics, and every experiment will run the same in any reference frame. For

example, if we experiment in a stationary lab, the results will be the same as experimenting with a moving plane. This is why the first postulate was made, namely, to equate the laws of physics in every state or inertial frame. So, all the laws of physics in the inertial frame of reference will be subject to Newton's laws of motion. Second Postulate: "The speed of light is a constant, independent of the relative motion of the source and the speed of the observer". Einstein's second postulate in the special theory of relativity is a consequence of his first postulate.

According to Newton, speed can increase like a simple vector. If, according to the first postulate, then the speed of light can increase and vary for each observer. However, Einstein issued a second postulate to refute this. Reported to Lumen Learning, Einstein started from an experiment conducted by Michelson-Morley that light is a different wave because it does not require a medium to propagate and does not depend on the movement of the source. Einstein's second postulate concluded that the speed of light (c) is always the same in a vacuum, which is 3.10 ^ 8 m / s in any frame of reference. This means that the speed of light seen by a stationary observer or a moving observer will always be the same. No matter how the light source is, whether it moves quickly, has high intensity, or is dim, the speed of light remains the same. For example, the speed of light from a flashlight and a lamp will always be the same, even though the lamp is attached to the roof and the flashlight is carried. So, it can be concluded that light waves are constants that are not affected by Newton's laws.

By the title of this study, the discussion is the Advancement of Technology in the Film Dejavu. In the film, there are signs and meanings. From the denotative and connotative meanings in the film, they were successfully identified and then analysed and have a specific purpose, meaning, and a hidden and deep meaning. A sign is something physical, can be perceived by our senses; a sign refers to something outside the sign itself, and depends on recognition by its users, so that it is called a sign.

About the film which is full of symbols and signs, then what will be the researcher's attention here is the aspect of technological progress in conveying messages or knowledge obtained, where with the Theory of Relativity it will greatly assist researchers in examining the meaning of the depth of a form of communication and revealing the meaning contained therein. Simply put, the Theory of Relativity, through this theory explains that the laws of physics will always be the same and constant wherever they are. However, something that happens in space and time is what makes it different. Through different views will produce different space and time events. All of these things are relative. Space and time are interwoven into a single continuum known as space-time (*spacetime*). Events that occur at the same time for one observer can occur at different times for another. Space-time is not something we usually talk about as up-down, left-right, front-back, and separate from time. According to this theory, space-time is not a separate thing.

Space and time are intimately connected and intertwined: when space bends or stretches, it affects time. While the bending or stretching of space-time is the basis for gravity in the universe. Einstein thought of space and time as interwoven like an infinitely long

'blanket'. A massive object like the Sun can bend the 'blanket of space-time' with its gravity, so that light no longer travels in a straight line when it passes the Sun.

Every bit of matter, including humans, can bend the space-time around it, creating its gravity, albeit very small. However, gravity only works in flat space and planes. On a large scale like a star, Newton's laws don't apply because stars can bend and stretch space so that space, time, and light are the ones that matter most. Even a medium-sized planet like Earth can bend space enough to affect time.

CONCLUSION

Based on the results of this study, it can be concluded that the concept of physics contained in the film Dejavu is the concept of the Theory of Relativity explained by Albert Einstein, the general Theory of Relativity, black holes, wormholes, and so on. The scientific phenomenon in the film, which is by the concept of physics, is also narrowed down by Isaac Newton, who explained that the force of gravity is categorized as a centripetal force that causes centripetal acceleration. The phenomenon of time dilation can also be an object at the speed of light because it is near a strong gravitational field. This scientific phenomenon also has a discrepancy with the concept of physics, namely the phenomenon of Black Holes (*Blackhole*), so that it can return to the past with a certain time. This is only a sweetener in one digital computerization effect because this concept has not been explained with certainty by experts, and is only limited to thoughts with proof of a mathematical equation, namely, the carrying of objects can be conveyed by an electromagnetic aid either in the form of a small object or something larger. Black holes that have a strong source of gravity are very easy to refer to fantasy rather than reality because there is no safe path that is large enough for objects or materials that enter it, and the phenomenon of interaction between dimensions allows for interaction with humans in the past or future is an idea that is very far from the real world so that it can be seen as a fantasy rather than reality.

Black holes, also in the context of science, still need to be considered. This film is one of the physics concepts that explains the theory of general relativity explained by Albert Einstein. There is a slight possibility that in the human subconscious, there are actually many things like this, but it is still difficult to solve by human logic in general. From the existing Earth structure, we are only able to dive less than 30 percent of the Earth's contents. We can only explore land about 40 percent, explore the air about 20 percent, and explore the sea is still about 5 percent of the sea content contained in the earth until now. Therefore, science until now will continue to develop according to its usefulness and needs.

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