A STUDY ON THE VISUAL EFFECTS IN THE MOVIE

AVENGERS: AGE OF ULTRON

NAWAL MOHAMED. A. MOHAMED

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UNIVERSITY OF MALAYA

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ABSTRACT

Early of the twenty-first century, world population used to watch or to listen to different types of Hollywood media based on movies. Movies, is categorized as one of the most outstanding cultural activities. On a variety of economic and cultural phenomena in societies, nowadays, cinematic technology has added a valuable importance to the apparent sensitivity of the moviegoer's experience. Technologies in the contemporary period are creating digital cinematic films and produces how modern people perceive executives no longer real scenes before the camera starts recording objectively. However, they can be built by notable increases in computer generated imaging (CGI), motion capture technology and 3D digital camera systems. As the starting point of the film, audiences and producers claim a current relationship between reality and the green screen technology. Digital cinema currently allows the viewer to inhabit and interact with cinematic reality in a unique way, and this new paradigm shift from analog to digital has created the basis for new ways of watch the film and manipulated picture filmed reality. The goal of this study is to analyze the film Avengers: Age of Ultron according to its visual elements, generic elements and production and to identify the using of visual effects in a film. This research focuses on collecting information from secondary data. Secondary data sources are involved, through the analysis of qualitative methods. This study will be able to afford to show evidence that the presence of film-based manufacturer incentives such movies. However, demand for digital effects, 3D visualization, computer graphics and all other modern technologies is growing and is still steadily since its first appearanc

ABSTRAK

Awal abad ke dua puluh satu, penduduk dunia yang digunakan untuk menonton atau mendengar jenis Hollywood media berdasarkan filem. Filem, dikategorikan sebagai salah satu aktiviti kebudayaan paling cemerlang. Pada pelbagai fenomena ekonomi dan budaya dalam masyarakat, pada masa kini, teknologi sinematik telah menambah kepentingan bernilai kepada sensitiviti yang jelas pengalaman penonton pawagam ini. Technologies pada tempoh yang kontemporari mewujudkan filem sinematik digital dan menghasilkan bagaimana orang moden menganggap eksekutif tidak lagi adegan sebenar sebelum kamera bermula rakaman secara objektif. Walau bagaimanapun, mereka boleh dibina oleh kenaikan yang ketara dalam pengimejan komputer dijana (CGI), teknologi menangkap gerakan dan 3D sistem kamera digital. Sebagai titik permulaan filem itu, penonton dan pengeluar mendakwa hubungan semasa antara realiti dan teknologi skrin hijau, pawagam digital kini membolehkan penonton untuk mendiami dan berinteraksi dengan realiti sinematik dengan cara yang unik, dan ini anjakan paradigma baru dari analog kepada digital telah mencipta asas kepada caracara baru menonton filem dan gambar difilemkan realiti dimanipulasi. Matlamat kajian ini adalah untuk menganalisis filem mengikut elemen visual, elemen generik dan pengeluaran, untuk menjelaskan pengaruh kesan visual dan khas pada filem dan untuk mengkaji kepentingan menggunakan kesan visual dalam filem. Kajian ini memberi tumpuan kepada mengumpul maklumat daripada data sekunder. sumber data sekunder yang terlibat, melalui analisis kaedah kualitatif. Kajian ini akan dapat mampu untuk menunjukkan bukti bahawa kehadiran insentif pengeluar berasaskan filem-filem tersebut. Walau bagaimanapun, permintaan untuk kesan digital, visualisasi 3D, grafik komputer dan semua teknologi moden yang lain yang semakin meningkat dan masih berterusan sejak penampilan pertamanya.

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TABLE OF CONTENTS

Abstract	i
Abstrak	ii
Acknowledgements	iii
Table of Content	iv
Appendix	vii
List of Tables	viii
List of Figures	ix
CHAPTER ONE: INTRODUCTION	
1.1 Background of study	1
1.2 Problem statement	4
1.3 Research Objectives	5
1.4 Research Questions	5
1.5 Significance of the Study	5
1.6 Scope of the Study	6
1.7 Limitation	6
CHAPTER TWO: LITERATURE REVIEW	
2.1 Introduction	8
2.2 Trends in Movies and 3D Digital Technology	9
2.3 The different between Visual Effect, Special Effect and Picture Effect	11
2.3.1 Visual effects (VFX)	12
2.3.2 Special effects (SFX)	12
2.3.3 Picture effects (PFX)	12

2.4 Digital Cinema and Cinematic Impact

13

2.5 Computer Generated Imagery and Reality	15
2.6 Power of the Visual Image	19
2.7 Cinematic Realism	20
CHAPTER THREE: METHODOLOGY	
3.1 Research Design	23
3.2 Data Collection Method	23
3.3 Qualitative Research	24
3.4 Proposed Analysis	24
CHAPTER FOUR: ANALYSIS AND DISCUSSIONS	
4.1 Approach	26
4.1.1 Space and 3D	26
4.1.2 The dense image	27
4.1.3 The visceral image	30
4.1.4 The poignant image	32
4.2 The process	34
4.2.1 Spatial narrative	34
4.3 Visual Effects	36
4.3.1 Method Studios	38
4.3.1.1 Territory studio	39
4.3.1.2 Trixter studio	39
4.3.2 Green screen or Blue screen	41
4.3.3 Motion in Computer Animation	44
4.3.4 Lighting	50
4.3.4.1 Quick Quicksilver	50

4.3.4.2 The magic of Scarlet Witch	53
4.3.4.3: Light effect in Thor	56
4.3.5 VFX and compositing	57
4.3.6 Three dimensions (3D)	58
4.3.6.1 The Hulk	59
4.3.6.2 Iron man	67
4.3.6.3 Animal Logic	69
4.3.6.4 Creating Holograms and Cyberspace	71
4.3.6.5 Houdini Digital Assets and Animal Logic	72
4.3.6.6 Rendering with Mantra	72
4.3.6.7 Ultron Mark I	73
4.3.6.8 Envisioning Vision	75
4.4 Conclusion of the analysis	77
4.4.1 Use Visual Effects? In this movie	77
4.4.2 Quality of movie	79
4.4.3 Physical effects in the movie	80

CHAPTER FIVE: CONCLUSION AND RECOMENDATION

5.1 Conclusion	86
5.2 Recommendation	89
References	91

APPENDIX.....

Appendix I: The Marvel Avengers Series Film Details -from international moviesdatabase as of March 31st, 2014 - (Chronological order)97

LIST OF TABLES

Table (1.1): cast of movie Avengers: Age of Ultron

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LIST OF FIGURES

Figure 1.1: Theatrical release poster	2
Figure 2.1: Ultron is the funniest evil robot made by digital technology	15
Figure 4.1: Captain America in clip showed space-image in Avenger	27
Figure 4.2: The dense image of attack of Ulton in movie Avengers: Age of Ultron	
(2015)	28
Continued figure 4.2: The dense image of attack of Ulton in movie Avengers: Age of	f
Ultron (2015)	29
Figure 4.3: The flying of iron man can be recreated in actual scale within the virtual	
space	29
Figure 4.4: Hulk vs. the Hulkbuster in Avengers: Age of Ultron examples of a visce	ral
image	31
Figure 4.5: The heroes as poignant image	33
Figure 4.6: Holo-J.A.R.V.I.S, Holo-Ultron in Avengers: Age of Ultron	36
Figure 4.7: Visual Effects in the movie by Industrial Light & Magic	37
Figure 4.8: Blue and green screen technology in Avengers: Age of Ultron	42
Continued figure 4.8: Blue and green screen technology in Avengers: Age of Ultron	43
Figure 4.9: Green screen in Avenger: age of Ultron(2015)	44
Figure 4.10: Actors imitate Ultron in film Avengers: Age of Ultron	46
Figure 4.11: Thor with Hulk in film Avengers: Age of Ultron	47
Figure 4.12: Mark Ruffalo plays character as a Hulk in film Avengers: Age of Ultro	n 47
Figure 4.13: Ultron in the film is during a big party the Avengers	48
Figure 4.14: Spader's Ultron looked to the cast	49
Figure 4.15: Spader's Ultron looked to the cast	50
Figure 4.16: Quicksilver and his photographic trail.	51
Figure 4.17: Quicksilver in action.	52

Figure 4.18: Quicksilver helps out Cap during the train sequence.	53
Figure 4.19: The magic of Scarlet Witch	54
Figure 4.20: Sequences to make effect of the light	55
Continued figure 4.20: Sequences to make effect of the light	55
Figure 4.21: Thor and light effect	56
Figure 4.22: Special effect with Thor.	57
Figure 4.23: Hulk was rebuilt the muscle system	60
Figure 4.24: ILM worked on new muscle and skin simulation for Hulk.	61
Continued figure 4.24: ILM worked on new muscle and skin simulation for Hulk	62
Continued figure 4.24: ILM worked on new muscle and skin simulation for Hulk	63
Continued figure 4.24: ILM worked on new muscle and skin simulation for Hulk	64
Continued figure 4.24: ILM worked on new muscle and skin simulation for Hulk	65
Continued figure 4.24: ILM worked on new muscle and skin simulation for Hulk	66
Figure 4.25: Before and after the render in the movie.	67
Figure 4.26: Iron man before and after the render	68
Figure 4.27: Flying Iron man	69
Figure 4.28: J.A.R.V.I.S. and Ultron holograms.	70
Figure 4.29: Ultron Prime.	74
Figure 4.30: Ultron Mark1	75
Figure 4.31: Paul Bettany as Vision.	76
Figure 4.32: They used Cinema 4D to make some amazing simulations	77
Figure 4.33: They used RealFlow to make some amazing simulations	79
Figure 4.34: Avenger: age of Ultron (2015)	80
Figure 4.35: Car effects	82
Figure 4.36: Fire effects and Explosions as Special effects	83
Figure 4.37: Modeling of Hulk's hand as Special effects	84

Figure 4.38: Make up as Special effects	84
Continued figure 4.38: Make up as Special effects	85

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CHAPTER ONE

INTRODUCTION

1.1 Background of study:

Enormous progress in the 3D effects which is a project between the visual effects, the procedures associated with the industry and others. From the Lumière brothers who had introduced the first public screening of a film in 1895 (Karney, 2005), significant improvement in the field of cinema which seems utopian switched to a more realistic experience. This was mitigated by the digital 3D technology where employees of the enormous power of computer generated imaging software on the break screen, deep, crossing the border power of 3D. Computer graphics and visual effects are a major part of the film industry these days. Improved computer graphics (CG later in the text) has increased considerably since the first computer animation effect was in the movies.

This development not only says a lot ability of the film and the experimental story, but how can we analyze the joys of spreading cinema?. The cinematography industry can hardly think without visual effects and computer generated imagery (CGI, which later in the text). One of the main reasons of such a generated imagery computer rapid development was the enthusiasm of the spectators to develop and the development of computer technology. The principle that CGI provides opportunities for cinematography and advertising of the industry are several types of visual effects and 3D graphics. In animated films as much as in feature films and commercials now, with the advancement of digital technologies, it is conceivable a real research can renew regarding the environment in movies, various methods action and do all sorts of creatures, animators and designers.

Avengers Age of Ultron (figure 1.1) is an American superhero film in 2015 given the superhero team Marvel Comics produced by Marvel Studios and distributed by Walt Disney Studios Motion Pictures. The Avengers series is a vast 15 Movie series, crosses several superheroes miracles.

Comic -Iron Man, Hulk, Captain America, and Thor - in exceptional superhero combat team that protect the land: Avenger. It was also the spin-off of 2012's Avenger and the eleventh edition of the cinematic Marvel universe (MCU) .The film composed and coordinated by Joss Whedon. The Avenger considered as the ever epic movie that follow the greatest aforementioned superhero. Outpost in Sokovia was Wolfgang von Strucker who is monitoring a study on the website of Loki sceptre. Both got the Hydra of subjects twins Pietro and Wanda Maximoff, human super abilities by the sceptre; Pietro with his incredible speed, while Wanda psionic abilities like telekinesis and hypnosis. These supernatural abilities are the ultimate test to save the planet. As the infamous occurs, it is up to the Avenger to avoid prescribing its cruel, and soon plans hamper cooperation and worse unexpected actions set the stage for an epic and unique adventure.



Figure 1.1: Theatrical release poster <u>http://www.comicbookmovie.com/fan_fic/avengers-age-of-ultron-poster-a104790</u>

In the Avengers Age of Ultron, Avengers team must work together to defeat <u>Ultron</u> a mechanical deformation of the artificial intelligence of the refund and the result was declared in May 2012. Following the successful release of the Avenger, Whedon, the manager of the first film was back on board on August and release date has been set on April 2013, Whedon had completed a draft of the script and casting began on June with the re-signing of Downey. The second unit filming began on February 2014 in South Africa with principal photography took from March to August 2014. The film was mostly shot in Shepperton Studios in Surrey, England, in rotation with other recordings in Italy, South Korea, Bangladesh, New York, and in various locations around England (Wikipedia, 2015).

Directed by	Joss Whedon
Produced by	Kevin Feige
Written by	Joss Whedon
Based on	The Avengers by Stan Lee and Jack Kirby
Cinematography by	Ben Davis
Production Company	Marvel Studio
Distributed by	Walt Disney Studios and Motion Picture

Table 1.1: Cast of movie Avengers Age of Ultron

Avengers Age of Ultron actors are Joss Whedon who leads a cast with Chris Evans (Captain America), Robert Downey Jr. (Iron Man), Chris Hemsworth (Thor), Scarlett Johansson (Black Widow), Mark Ruffalo (The Incredible Hulk), Don Cheadle (war), Jeremy Renner (Hawkeye), Cobie Smulders (Maria hill), Samuel L. Jackson (Nick Fury), Paul Bettany (JARVIS / vision), Aaron Taylor-Johnson (Quicksilver), Elizabeth Olsen (Scarlet Witch), Hayley Atwell (Peggy Carter), Idris Elba (Start), Anthony Mackie (Falcon), James Spader (R), provide Skarsgard (Erik Selvig), Thomas Kretschmann (Baron Strucker), Josh Brolin (Thanos), Claudia Kim (Dr. Cho), Andy Serkis (Uylsses Klaw), Henry Goodman (Dr. list), Julie Delpy (Madame B) and Linda Cardellini (Laura Barton) as stated in (Flickeringmyth, 2015). Obviously, the film has revolutionized the use of computer graphics. More importantly, effects are still convinced after 16 years; certified in order to stand the test of time.

The assembly of the technical elements: realistic models and textures, believable, and the animation of attention to detail in composition. They had abilities to film the scenes and plates more close to reality, live the prehistoric dinosaur animation. This contributes to the reliability of the movie because the process does not need more attention. All effects of the film sequences were shot realistically. The film was a revolution in narrative aspect which was related not only to a story, but also mixed in themes and classical genres and was modified to be lively and exciting.

1.2 Problem statement:

For a number of years, visual effects were in the scenario of films. There are two types of effects, one is the obvious or overt visual effects and the second is the hidden/concealed, visual effects. Both types of visual effects in movies are used as the main equipment to improve the real effect and exciting action scenes. This practice has been in the industry absolutely clearly designed for certain time and had the technological improvements and innovations. Technical information, skills and new discoveries in the computer-based software such as 3D animation have been able to improve the use of such outstanding effects and their integration into films with extended gain in the application. Some films are hailed for strong visual effects, and are distinguished by critics and audiences, always classics not only innovative technology, but also its implementation in the story. The selected movie Avengers: Age of Ultron,

most if not all of its scenes produced by using the techniques of visual effects more than other movies so, the aim of this study is to investigate the technical requirements of visual effects and characters as they are on visual effects. By analysing these requirements, we can learn to defy what visual effects and the test of time.

1.3 Research Objectives:

The objectives of the study are:

- To analyse the most used technology approaches in a movie Avengers: Age of Ultron.
- 2) To identify the using of visual effects in the movie Avengers: Age of Ultron.

1.4 Research Questions:

The current study attempted to describe the role and importance of special visual effects in movies based on the following questions:

1. What kind of technological approach is in the preparation of movies?

2. What is the process of the visual effects that are digitally manipulated in the computer?

1.5 Significance of the Study:

This research investigation is an important step in assessing the question of whether young designers are aware of their heritage, culture and the foundation of their conception.

This kind of study could be worthy and significant in increasing the knowledge in related field of technology. The result of the study will lead to help in determining the importance of visual effects in high ranking movies. The study determines the role of the film production and serves as a reference material and the body of knowledge for researchers; motion designers, directors, editors and video enthusiasts. The study may help directors and producers in improve their skills in order to obtain good quality of the productions.

1.6 Scope of the Study:

The testing and investigation of the use of visual effects and their importance in films production are advantageous for technological and the cinematographic fields alike. Essentially holds enormous significance in the fields of technological innovation and in the successful development of the movies.

As the framework for this study, the Avengers Movie is analyzed in this study based on many features, including visual effects, graphic design, computer generated 2D and 3D images (CGI), computer animation, motion capture and special effects. Each of these features is applied for nine selected scenes from the Avengers movie. The first scene is the fly of Iron Man, the second scene is the attack of Ultron by the end of the movie, the third scene is the Hulk against the Hulk Buster, the fourth scene is reconstruction of Hulks muscles, the fifth scene is Holo-JARVIS, Holo – Ultron, the sixth scene is the mimic actor, Spader's Ultron and Mark Ruffalo plays character as Hulk, the seventh scene is the fire, light and effects of explosions, the eighth scene is Captain America in the clip showed space image and the ninth scene is the Quicksilver in action and magic of Scarlet Witch.

1.7 Limitation:

Like every other scientific enquiry or investigation, it is plausible that this proposed study project also encounters certain limitations. As the study is related to the investigation of the importance ant the using of visual effects utilized in the movie Avengers: Age of Ultron, it is suggested that the study might face problems in integrating the intricacies of visual effects in movies, there are some secrets for make the movie which is did not reveal till now. The research will attempt to integrate the results in a coherent set of implications which are deduced from the thorough secondary analysis.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Throughout the history, the development of new communication technologies and multimedia platforms achieved tremendous worldwide changes in how people exchange information. Films can be either a temporary phenomenal experience and more importantly, it has a significant impact on the cultural climate. For example, films could be an introduction of a new theme, a style influence or promote a convention that changes in the habits, critics of authors, and the public to interpret literature. Visual effects have the power to offer multiple perspectives and different realities within the film and television industry. The most obvious aspect of improving glasses at the end of the twentieth century about visual culture; it is the so-called "blockbuster" movie, technologically efficient and many special effects. These movies are apparently the central symbol of the recent turn in the image forms.

The great success of movies has been firmly established as a valid and important business strategy in Hollywood since the 70s with movies such as "The Exorcist (1973)", "Jaws (1975)" and "Star Wars (1977)" which are cited among the first examples. In the mid-80s, an obvious structure based on a conical resurgence in technical special effects has been made to be seen in the production of hyper film media. Undoubtedly, this trend has been stimulated and supported by a number of developments in digital imaging technology. Examples of such early films including "the Alien (1979)", "Blade Runner (1982)", "The Last Starfighter (1985)", "the Abyss (1989)", "Robocop (1987)", "Total Recall (1990)". Scenarios and tends could give an audience an equal share stunning photos with narrative content and meaning. As the 21th century began, remarkable development of such films appears. On the other hand,

such movies issued only a few general revenues of the cinema standard; nevertheless, they always detect most of the pre-release advertising and produce the most benefits.

Thus, research documents dealing directly with the appearance of reality and emotion towards fiction are tinny documents. Previous studies have shown that the experience of watching movies in stereoscopic 3D is different while watching in 2D types. For example, (Po"lo"nen et al., 2009) indicated that respondents rated 3D movies as a reliable, realistic and fascinating. Other studies have shown that 3D depth enhances the feeling of presence, natural or not mediation (IJsselsteijn et al., 2001, 1998a, b). Thus, for the stereoscopic depth of handling in this manner, it is conceivable for a visual experience that is more similar to 3D from the viewer's point of view of its daily physical world. This type of control also allows empirical control of parameters such as volume, size, and quality and how these variables are as fixed (Cho et al, 2014. Huang et al, 2014.). Despite the fact that 3D movies have enjoyed a renaissance in recent decades, they probably were not widespread enough to say that everyone has experienced this kind of films. It is conceivable that the 3D experience group rose emotion on their commitment with a new experience, and this trend should be investigated. Researchers have defined realism as a multidimensional construct (Battery and Greenberg, 2000; Hawkins, 1977; Potter, 1988; Shapiro and Wedge, 2004).

2.2 Trends in Movies and 3D Digital Technology:

The development of films to cinemas, drive-in movies, television programs, cable television, video recording, DVD Rental, Online DVD Rental, Online DvD Rental, Online Downloads, illustrates the need for a review of the mainstream of contemporary cinema experience, moviegoers' preferences and different motivations behind the process of priority selection a film. For example, an "avid" movie-goer, the film is an enthusiasm

and is fundamental to be on their social life, illuminate and reveal important facts about the human being and more compelling, the zealous viewers can derive satisfaction even from a rejected film. However, to meet the tightened reason for the overwhelming people through a film, it is to experience, but as the end of the story that, it is all about enjoyment, rather than the core of the story "credibility"; it is more about being with close friends or partners; for a middle-aged movie-goer, "Escapism", the great motivator along with entertainment.

A study of cinema consumers found that moviegoers goods preferably young and educated. This is related positively to the preference for the cinema, whereas family responsibilities similar negative with this setting. Since the initiation and dynamic improvement of cinema, there have been many trends in the production of films and their success. One of the earliest trends in these days has the pre-eminence expensive movies from the film industry. This high budget films are found to be excessively burdened with the special visual effects, have become a common trend in such a high budget film projects. According to a statement about the prediction of "future consequences", viewers are also fully recognized as addicted to this kind of films and are unlikely to enjoy the special visual effects in movies. In addition, (Ji & Waterman 2010) argued that the trends of employment special visual effects in movies at the box office have noticeably changed the norm and practice the default action illustrated in the movies. It was an unavoidable and noticeable rise in the levels of aggression in movies. Moreover, the utilization special digital effects have basically the destruction in the wake of bloody battles and aggressions to an extreme level. The demolitions as revealed in the films by the use of special visual effects have observed an unparalleled increase in its hardness and idealistic situations. The capacity and the ability of digital compositing and VFX imports of such potentially allow a refined and expansive improve any movie work.

The properties of 3D animation by means for cultural representation and education are studied and applicable. The link between 2D and 3D animation is investigated which is crucial in the context to understand 3D CG (computer generated) animation whose production is based on the principles established in the early animators working on 3D and 2D shapes. Furniss (1998) argued that the animated 3D objects with a body and form. The height, width and depth although they indicated that 2D animation mastered the techniques, 3D animation for several years in the form of *"business success and scientific debate"* (ibid.).

The situation has changed now in the twenty-first century being more and produces more 3D animation. is the production of 3D CG animation becomes feasible because the improvement of new digital technologies have affected the image and manipulate everything from the production of animated text for distribution, reception, and aesthetic aspects (Crawford, 2003). It's intuitive and VFX established as ingenious performances of the subtle interaction of players in spectacular effects, can have an immediate and significant interest on the screen.

2.3 The different between Visual Effect, Special Effect and Picture Effect:

There are many different types of computer graphics (CG) techniques nowadays documentaries, such as computer generated 2D and 3D images (CGI), computer animation, and even "control" of the data produced by the computer, also known as human-computer interaction (Wikipedia, 2009). In this study, we focus on three effects, visual effects, special effects and image effects. The term visual effect is used to illustrate images produced, modified or improved to a movie or other media that is not accomplished during the shooting live action. In other words, the art collections of visual effects are performed during the production period, shortly after the development of the bases.

2.3.1 Visual effects (VFX): It can be added to the live action detection by techniques such as matte painting; front and rear projection; sets or miniature forced perspective; graphic objects and environments of the computer, the characters and the different images recorded in compositing different ways. The last explosion in digital tools perfect compositing, digital setting and completely computer generated character feasible and open to the moving image makers at all levels of visual effects as an integral part of every Moving Picture Maker's tool kit Okun and Zwerman (2010). From the review, visual effects is widely used, however, in this research, study the techniques of visual effects in the movie Avengers.

2.3.2 Special effects (SFX): It is commonly referred to as technique, which can be done at the same time with the live action scene. The scenes are captured and are typically larger than the practical consequences. Special effects go hand in hand with visual effects in the current methodology, so it generally identify troublesome, who was a special effect and a visual effect has been.

This coordination has been enhanced by digital technology. For example, the beginning of the line with the digital age expansion allows more flexibility for special effects for artists to develop drilling platforms set when flight greatly improve safety for all concerned. Samples of typical special effects are ball strikes, rain, fire or explosion to imitate the universal movement, practice of ships or aircraft, car gags of all kinds, beating derricks, motion, shake or accessories platforms or vehicles, and artificial waves spray Zwerman and Okun (2010). To produce a film, printing begins in another area next to real life; one of the reasons is the special effects. However, recent studies, we can assume that there are limited studies on special effects. This study focuses on computer generated images.

2.3.3 Picture effect (PFX): The impact will be in the picturization the action scenes are technically organized and interpreted so that no real present action scenes like real

scenes. The special effects are required by Digital Design of animated scenes and their combination with scenes of real live video on all films. The effects are most often associated with event scenes images and characters that are not in the real world or not photographed, but they are also financial reasons. Using matte painting in this example uses a simplistic approach to the basic projection butt each other in practice focusing on technology, including green and blue screen technologies. The existing results indicated that both conceptual and perceptual factors confer advantages to picture over words in memory.

2.4 Digital Cinema and Cinematic Impact:

The introduction of digital technologies in the production process of the new trend of movies has allowed the development of this new sense of realism and trend to be made. Specifically, various kinds of exposure manifest in each index under discussion and to some extent, at least in terms of different ways that the digital imaging capabilities are provided in an aesthetic way.

Thus, positive reception of the films of mainstream digital cinema depends as much on a fascinated spectator, immersed in dazzling and 'spellbinding' imagery, as on identification with character and the machinations of plot and theme. Computer imaging techniques have created directly and indirectly a central power in this new mode or genre. This important and unique register of illusionist spectacle cinema, as in the technological thrill movies such as Terminator 2; "Judgment Day (1991)", "The Mask (1994)", "Speed (1994)", "True Lies (1994)", "Independence Day (1996)", "in Starship Troopers (1997)" and "Titanic (1997)".

With the advancement in technology, it creates unimaginable things in action films and their implausible scenes became one of the most important features of digital cinema. These movies are also linked to the animation films produced for young audiences, bridging the gap between the imaginary and illusory fantasies with many materials projected in movies (McEachern, 2007).

The digital nature of the films was directly related with the special effects, for instance, action increases the mass destruction of the playing area in the Dark Knight film. This means with digital cinema and its large role in the production; amazing blockbuster special visual effects plays as a deep element in the production of action movies. These are detailed processes in which images are formed in the environment or context. This includes the coordination between scenes shot with live videos produced outside the context of live recordings. These imaging technology products have worked to give a realistic look to the settings you appear as if shot is live for the crowd. The application and creation of visual effects in films have proven to be costly in term of investment, income and time (Cram, 2012).

The expertise for such use, production and implementation also require skills and crucial abilities in order to succeed in implementing technology in movies. There were several awards for the improvements through the cinema. Centre of digital technology and the wonders he has in producing wonderful movies. The fabulous, "twenty five reasons it's all over" in 2001 to the end of cinema to our knowledge in 2001, there have been many critics and even appreciation of how the films were produced. The simple functionality of digital cinema is the assimilation of the art of data processing in the various processes of the production of films. This process in most cases includes the production, distribution and exhibition of films.

Contemporary, filmmakers are working under the banner of digital cinema use these methods and techniques to help in the improvement of digital audio and video editing (figure 2.1). It is basically plays its role in the colours of the digital image and finally improve digital aspects that perspective visual effects in movies.



Figure 2.1: Ultron is the funniest evil robot made by digital technology http://variety.com/2015/film/news/avengers-age-of-ultron-cgi-special-effects-1201487125/

Theatre and films shooting has extremely left the boundaries of the physical edges of the cinema. They have long way to process the actual and live recordings of scenes. It is common now to proceed the recording of films in the frequent streets, the markets, and even the space. It has become in the course of the technology to the film industry vital for researchers and reviews of cinematography to drive the level of suggestions.

2.5 Computer Generated Imagery (CGI) and Reality:

CGI stands for computer generated images (also known as computer-generated images, and is often abbreviated CG or CGI) is an interpretation of 3D animation and computer graphics. CGI is used for graphics animations such as the ecological environment and the 3D aspects within the film industry. For example, "The Hobbit (2012)", "Avatar (2009)", and the Pixar film "Toy Story (1995)" (Shilo, 2007). Computer Generated Imagery is the most talked about contemporary technology utilized in the filmmaking using motion design and 3D programs such as:

a. Motion design Applications include:

- Adobe after Effects.
- Autodesk Composition.
- Apple Motion/ Shake.
- Max/MSP.
- Apple Quartz Composer.

b. 3D Programs used in Motion Graphics include:

- Maxon Cinema 4D.
- Softimage XSI.
- Autodesk 3D Studio Max.
- Autodesk Maya.
- New Tek Light wave.

Innovation were issued in 1960s info-graphic in graph plotters, Massachusetts Institute of Technology Lincoln Laboratory came to the idea of connecting a computer to a cathode ray tube (CRT) television to the conceivable computer animation. The system has been used for the differential equation solutions (Kerlow, 2003). Prompted this development, Ivan Sutherland improve his program Sketchpad acting as the origin of computer graphics in a practical means (Bendazzi 2001).

The system allows users to interact with wired objects with a light pen (Kerlow, 2003). The United States and Canada are the priorities of computer animation business in the 1970s, due to the strong competition between the TV networks. The Japanese were among the first phases of development of computer animation, but because of their relative lack of software, they have focused more in the 1970s on the production of hardware – computers for their rapidly growing manufacturing industries.

However, over the next decade, Japanese computer animation has been revived (Bendazzi 2001). As early of 1974, computer graphics were duped viewers see in the

unimaginable things and unimaginable places (Geller, 2008). Raw data can be given or in the computer, with software as a digital sculptors and animators (Wolkomir 1990).

Computer graphics produced on the digital display to make for an actor, or even a complete character. In addition to technology, enable digital graphics, more control and inventive in the visual aspect of the film, the artists create detailed models, backgrounds and characters at an incredibly low price in comparison to the material investment (Geller, 2008; Wolkomir 1990). Accordingly, the digital effects are more necessary unlike mechanical or optical effects. Bernard (2011) provides for the use of CGI in films with serious concern that judge do what the true filmstrip is producing unimaginable. The generation is unthinkable through technology stands out among the invigorating aspects reflected in action movies. It generally enjoys lively debates in film criticism even with the CGI, a missing points and the possible effects even if the presence of these outstanding technologies; having someone had mentioned in their minds before it on the technological aspects (Skilton, 2007). For example, the scenes with digital LED controls in the Hunger Games - catch fire, and the man of steel in recovery reflects the predominance of special visual effects; but they need to be consulted by the imagination predominant reality (Christiansen, 2013).

The computer innovation brings an uprising on the lively appearance. Computer graphics, computer boosters and computer animation has completely changed the world of animation (Bendazzi 2001).

In the early CGI development, the effects created in principle for horror, thriller or films for the production of the supernatural scenes in the previous films. England's John Halas was among the first to traditional computer - generated short film animator of the US dilemma. Lasseter worked with Keane in the nature of things that has been tested, and slide the combination of Phillip Mittleman (mathematics Synthavision Applications Group Inc). It was a computer rendering and animation system (Furniss, 1998). Computer animation can be largely recorded in the film industry because of its time. The scenes can be joined quickly by wire line forms, simple colouring and shading images with computer animation to control lighting, camera angles and actors on the stage. This help administrator to possess a prior idea on the scene and decide if there are changes need to be made (Bendazzi 2001). Therefore, the possibility of realization, production and shows an animated television series has become a reality thanks to technological improvements in computer-generated imagery. However, visual effects is put into creating scenes of mass destruction, destruction and devastation in the spectacular action scenes. That's why movies like Terminator, Star Wars, Batman was colossal Box Office Hits (McEachern, 2007). For first time, the various aspects of the new techniques were implanted in the film. A rainforest in the movie, the audience could see which stunned on the screen it is affordable continuously along the movie time.

Due to this, filmmakers also innovates a method to grow a dense forest in three dimensions, for example, they created a novel and highly changes made throughout the technique of movie spots and actually provide various types of printing and mood. However, improved real-time motion capture technology of facial expressions and the muscle between the 3D model and a human being was an outstanding original new stage in the digital effects industry. Although there are different philosophies about the nature perceive reality. Thus, for the purposes of this study a reality is what can be seen through the senses and the agreement known facts in the physical world. It is in the same line with pipe (2010), agrees that reality is what can be seen and experienced by the overwhelming human. Earn Shaw (2010) postulated that realism is a true representation of the world and is associated with likelihood. This "first reality" can be seen in the manufacturing process all the live content. The newly created reality or "second reality" is recognized as diegetic world. This diegetic world is the history of

cinema (McClean, 2007). This suggests some diegetic world attenuated reality or authenticity, whether you. In a dream or science fiction world an example here is the Avatar (Cameron, 2009), a film that. In a strange world, and therefore outside the reality we know despite the fact that this movie is not our own view on the world and the reality is always based on reality and believability in accepting project diegetic world and reality. The visual effects are an integral part of the filmmaker process to create diegetic world. The computer-generated object is an innovation that physical presence is somewhat similar to what it means - it's just a lot of data in a microchip but by inserting his imagistic form, it can be done with such realism seems photographic possibly an index of speakers. It is important to know that, when used in addition to the name of the software, most respondents also have the purpose of using separate programs.

This has led to the production of categorization software:

- 3D animation and modelling (including sculpting, rigging, lighting UV mapping lighting and rendering) and visual effects (such as particle systems, dynamic simulations, fluid, atmospheric, morphing, etc.): 3D Studio Max, Maya, light -Wave 3D, Soft Image, Cinema 4D, Blender, Luxology Rendering Modo, Messiah, Houdini, Real flow, Pixologic Zbrush, Mudbox.
- For post-production, composting, 2D or 2.5D visual effects: eyeon Fusion, After Effects and Nuke
- Video Editing: Final Cut Pro, Sony Vegas, Render Man Premiere Pro
- Plug-in and Renders: Solid Angle Arnold, V-Ray, Mental Ray.

2.6 Power of the Visual Image:

The depiction of a message by a virtual image is seen as the most powerful and convincing of all media tools (Welch, 2001). For centuries through the history of

mankind, from the ancient Egyptians to religious institutions and artists of all kinds, still images have the strength and the power of the spread of emotions and passions in the minds of audiences. The non-verbal signals are carried out by a visual image is for an immediate exchange of messages that are not able to easily express in words. For example, the intensity of the message to one's mind by looking at a close-up picture of a dead body still with open eyes, just for a second, far overrides the intensity of reading a large, bold, written headline, the words "dead with eyes wide open". Associated with a plurality of visual images are in a series, as in a film and / or television, this depth and the power of images is excellent. This phenomenon can be manipulated, the perception of the audience influence even further when mixed with words or sounds.

The representation of someone in relation to attractiveness, health and strengthening a sign will worsen with more positive reactions than if the same sign was, and dirty Hunchback of Notre Dame, the same as, for example. This is a technique that Nazis quite clever in both still images and movies like (Jud Suess 1940), for example. Another example of the power of the visual image as the first television broadcast presidential debates in the United States between Richard Nixon and John F. Kennedy (Postman, 2006). Development and integration of Visual Image permit the fixing of the frame and the entire make-up of the film.

2.7 Cinematic Realism:

Recently many critics and film analysis (Hermiz Haley et al., 2012) revealed that there exist a likelihood issue in movies particularly in their ensemble. The production of the unusual and prospects in action scenes in movies captivate for target groups close to real. However, the main concept of cinematic realism to appear in movies is crucial that the public have to accept the reality of the images by computer technology and 3D effects (Hermiz Haley et al., 2012). Technological development has a key role in the production of unimaginable scenes but shows how the reality state in public. The fact that the public free real feeling of the computer-generated scenes also regarding how the scene was recorded in the right direction. So what technological means special visual effects are reflected in movies is closely linked with the fact that this jurisdiction has become an inexorable part of the film production (Ganel et al., 2008). The idea of realism in the cinema has become a rising, especially in the debate about the combination with special effects. Realism is in two aspects in cinema:

• As referring to the acceptance of the characters and events.

• As a real, mechanical reproduction of life (Faris & AMP; Zamora, 1995).

The majority of films have the old version of realism, and movies with special effects strongly enter the fascinating realism category. Realism is an attempt to produce an image of life as it is, or magical realism, based on the imagined reality as if it is the true reality.

It is based on realism, but only on what could be manipulated to the extreme (Bowers, 2004). It has fantastic elements as true, occurred in a practical way: the "real" and "spectacular" there in the same place (Bowers, 2004). to entertain objective films, but they are also at the front. Realism is a tool in the sense that if the player does not accept what you see, there is a slim chance that they accept or even understand the meaning (Braudy & AMP; Cohen, 2004).

Realism is not particularly that events have a real possibility of occurrence, but the questions and the ideology behind the film to connect with the audience (Braudy & AMP; Cohen, 2004). In this sense, tends to some point, often by the time the film is released, and is linked to the economic, political or social (Braudy & AMP; Cohen, 2004). Success is a movie you can count on the movie's ability to convince the public that the film is really whether or not it falls into the category of magic realism. In the film, as long as the scenario has an interesting and attractive, email, and includes the availability of funds and to communicate this message, and a representation of reality (Braudy & AMP; Cohen, 2004) .The connection between film and reality was constant discussion and debate since the early days of cinema.

In addition, their constant presence in a realistic world of interpretation is based on an aesthetic of discontinuity, by the high production of these elements, and yet by the production, continuity reigns. But the concept of discontinuity also flourishes as spectators realistically.

CHAPTER THREE

METHODOLOGY

3.1 Research Design:

The design of the current study is considered the methodical planning that is prepared studies on the subject of study. Methods and procedures of research are mainly the scientific plan or an arrangement for carrying out the implementation of a scientific study. The research confirms the basic explanation of the type of study and its aspects. This chapter includes the planning and arrangement of all related concepts dealing with the numerous research method processes such as the process of the study, data collection and other similar plans. Qualitative methodology was used in this study. It is usually characterized by its inductive and descriptive way in elaborating a finding.

3.2 Data Collection Method:

The data projected to be collected for the study by conducting a review of related and important literature to support a background and perspective to the research problem. The data collection for the current study through the secondary processes is projected to be carried out by the gathering relevant information from the data available on the topic. This will assist the researcher to find the information about the topic and the area of research. Primarily, it was envisaged that evidence would be available such as from thesis, magazines books, exhibition catalogues, and relevant journals and newspapers. This process of secondary information collection will be based upon the various studies, researches or investigations which have been carried out in relation to the use of visual effects employed in the movie Avengers: Age of Ultron. The data collected in this study is to analyzing the techniques of selected scenes in the movie Avengers: Age of Ultron such as, the green or blue screen technique, the technique of

the speed of Quicksilver, three dimensions (3D) of Hulk, Iron man and the physical effects in the movie.

3.3 Qualitative Research:

Qualitative inquiry seeks to understand human and social behaviour from the "insider"s" perspective – that is, as life is lived by participants in a particular social setting such as school, community, group or institution. It is an intensely personal kind of research, one that freely acknowledges and admits "the subjective perception and biases of both participants and researcher into the research frame. qualitative inquiry seeks to interpret human actions, institutions, events, customs and the like, and in so doing construct a "reading" or portrayal of what is being studied. The ultimate goal of this kind of inquiry is to portray the complex pattern of what is being studied in sufficient depth and detail so that someone who has not experienced it can understand.

It offers a rich and holistic approach to understanding the what, how and why of events in relation to the particular setting. The researcher does not have to prove or disprove hypotheses held prior to the study. Data from qualitative research is described in narrative form (as close as possible to the form in which they are collected) and in sufficient detail so that one who has not experienced the situation or event can understand and appreciate it. By using research made by film and literary scholars, combined with a close reading of the films, specific scenes and aspects of behind-thescenes are studied through their relation.

3.4 Proposed Analysis:

This study is a qualitative research approach in the same row with the following plan of action: a literature review is carried out in many fields, including literature and scenario. To detect with library and Internet research and the researchers used Internet
photo associated with certain film Avengers: Age of Ultron, and online databases have been accessed from the library. In addition, research is an overview of relevant and important literature to create a background and context for the research. This will help to install the researcher to establish the information on the subject and scope of the study.

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CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Approach:

4.1.1 Space and 3D:

Discussion: The entire story focuses on the question of how the selected movie provides space and spatial effects in the representation. From these priorities, derived the logic of images and the corresponding filmic procedures are checked. Place image as a strategy for determining a given spatial relates contains cinematic techniques and logic of the images show the spatial concerns. In examining how a room cinematic, the concept of space-image helps in this film about how a specific Spatial character of the place can be made. The Spatial character of the square will be adjusted as spatial concerns and the likely strategy of spatial image and the similar logic of the image can be used. Numerous characteristics and strategies of such techniques are then divided into several types of Space:

- a. Cinematic practice.
- b. Spatial impact.
- c. Spatial features of a place.

The technique: Avengers: Age of Ultron space images are used techniques for building the spatial representation. So with the spatial image categorized, they represent different techniques used to effectively show spatial acts in history. In Avengers: Age of Ultron, certain room and places will be held for the drama. Normally used in the camera capacity service for smooth interpretation of the drama. In this case, viewers are less aware of the outer regions as the dramatic action. But the history of the Avengers: Age of Ultron where the courts are to show the foreground a metaphorical point or are itself a character in his own. In this film, the camera focus on the spatial characteristics of the place and thus influences spatial detected. The camera techniques are then demonstrated in the service, as regards spatial. This is the case when the space-images are formed, such as images, which affects spatial images that simulate space, room, or create even place (in the minds of the audience).

We found in the Avengers: Age of Ultron (figure 4.1) director style is also to be particularly creative perception in cinematic spatial representation, but are categorized space image as a general principle criminal proceedings on a small level of image creation.



Figure 4.1: Captain America in clip showed space-image in Avenger: age of Ultron https://diaryofamovieaddict.wordpress.com/tag/theme-movies/

4.1.2 The dense image:

Discussion: the dense image is not tight in view of the large number of manufactures details in order to overload the audience. Rather, it is a faithful representation of the spatial density and complexity, longed in history. A dense image is thus a surgical and confidently describe complex. In fact, this can be simply defined as a photo realist view of an area of complexity. It could organize dense image as not such a cinematograph, but only in the brink of virtually animated world of cinematography. The contrast is compatible, because instead conquered positions of dense image in accordance with digital simulate. The density image is a materialization of human imagination, a logical representation of the world is a filtering of the given

complexity recorded and documented. Meanwhile, the dense image also kindled an emotional oscillation in the audience. It is not the awesome cityscape with skyscrapers rising; Instead, one would express the emotion with the experience of wonder to illustrate the experiences of the poet.

The technique: It is not a pretentious treatment techniques or visual effects, but a reality, a disinterested description discloses a world or place. It is a romantic version of the experience of the sublime, as. In the paintings of the 18th century The cinema eye sees it with cold effect and without exaggerating the largest of the structure and scope, it looks as if it is already a living reality.

In Avengers: Age of Ultron the imaginary world of complexity is different from the directorr who decides to populate the visual frame with complexity with more cars or people or buildings (figure 4.2).



Figure 4.2: The dense image of attack of Ulton in movie Avengers: Age of Ultron (2015) http://justmytwodinars.tumblr.com/post/112732332253/avengers-age-of-ultron-trailer-3-montage



Continued figure 4.2: The dense image of attack of Ulton in movie Avengers: Age of Ultron (2015) http://justmytwodinars.tumblr.com/post/112732332253/avengers-age-of-ultron-trailer-3-montage

It is obvious that digital composition in the virtual 3D environment in this film,

the flying Iron Man can be seen to project the real extent of the virtual space (figure

4.3). Its infinite generalization and representation of the virtual space is the fascination.



Figure 4.3: The flying iron man can be recreated in actual scale within the virtual space http://www.flickeringmyth.com/2012/06/fully-assembled-making-of-avengers

In the density image at this level, the standard conflict of the drama worked to its maximum limit. The conflict manifests itself visually on the screen through the dense image. But, built with the development of digital animation and the story of callous machine, the Guardian seems to be much more threatening and thus the image all the more unbearable and dense.

4.1.3 The Visceral Image:

Discussion: A visceral image is a sequence combining editing, *mise-en-scène*, and the underlying story a nice moment of viewing. It is gratifying, because it works viscerally rather than for a contemplative moment in the audience. It is an extremely engaging movie viewing experience because it offers a high degree of pleasure to the viewer. The visceral moment and visual pleasure are promises to viewers, a return to the basic idealistic attitude of cinema itself, not by its history, but also by the controller of the photographic image; in fact, the change of an implied reality. The importance of such psychological appliance is a dominant of the real, planted straight forward in the image itself, but a subtext of the story.

Cinematic technique and *mise-en-scène* must be set up carefully, to the point of being almost transparent. The no targeted action sequence will continue. As secondclass the visceral image can be drawn back to Hollywood blockbusters from the seventies, dominated the audience's attention by the tools the thrill and effects. However, you should not see these productions as mindless movies. When executed carefully and effects were accurately anticipated by the manufacturer, it provides an efficient and strong production mechanism in the capitalist system; an obvious, but technically transparent image, works closely with the human nature. It is a completely polished, highly articulated image production process, the self-conscious, intellectual contemplation of the image on the part of the film producer. Only some quest sequences live up to the visceral image have elaborate design and sophisticated rhythms, not. As regards the technical preparation of the sketch, but also its data processing influence on the audience The designers have full knowledge of what has been done before, and not repeat the trick on a Board audience who is only seen action sequences. The design of the sequence itself, therefore is an exercise that a meticulous revision of a simple issue; but it must work closely with the history to produce emotional impact.

As space represented, it shows how the film machine is able to register in "space", an ultimate eye position, in fact, the view. The visceral image includes the omnipotence of the entire vision. It is a penetrating gaze, which allows the narrow vision of the film to transcend audiences, the infinite, whether in space or in time.

The technique: Perfect sample of an intuitive image include Hulk against Hulkbuster clip (figure 4.4). In the scene, Hulk losing his mind in South Korea after Scarlet Witch has its spirit. Tony Stark looks to reduce the damage by calling in a new sign it with Bruce Banner, under the code name "Veronica" (the word "Hulkbuster" is never mentioned in the movie again).



Figure 4.4: Hulk vs. the Hulkbuster in *Avengers: Age of Ultron* examples of a visceral image http://sploid.gizmodo.com/behind-the-scenes-footage-of-avengers-2-shows-how-goofy-1698029033

It is a sign of a satellite in deep space to stop with sufficient power. Although an extended clip, there are two real standout moments in this fight, which you have not yet seen. We are not all gone, but Tony Stark has to stop a few other tricks up its pocket

when it comes Hulk and one of them may very well make the GIF moment of the entire film. You watch Hulk and Iron Man completely destroy each other and then there's still another hour left! This scene is not only some amazing action sequence; it provides a path for the rest of the film both Tony Stark and Bruce Banner, who always irritated by the fact that his Hulk sessions are ending with untold casualties. (If you've heard the rumors, you may be able to see where this is headed (<u>http://screencrush.com</u>, 2015).

All effects of free escape in the visual, spatial and temporal production of the image itself, making this a spatial operation. Here, the spatial adjustment of the production is in the aspect of complicity to discover the time and processing, the intuitive experience in their work most obviousness. There is no doubt that the "making of", adds the special effects and the have process itself on a DVD. the "making-of" sequences, which usually does not reveal in the movie-DVDs in retail shops or decoding of the process, so much as to remain some ambiguities, so that it more mysterious, and deepening view. To know more behind the scene not of course with the fascination of the image itself. This form of control of the normal quick cuts and precise camera position is displayed in terms of how the intuitive picture workers on the consciousness of the viewers' minds may shock".

4.1.4 The poignant image

Discussion: The memory of the essence of the film is the poignant Image. The poignant image happened when a shot showing just what was implied or kind of impression is in the last shot. As indicated, but telling, is an important detail of the cinema as a spatial description when a room is shown, enormous information to the audience. In its process of improving the concept of the place, there should be no abuse of the camera angle or framing, with respect to spatial information; there must be a continuous and smooth performance without redundancy and the flow is interrupted.

The technique: The poignant image brings the cinematic cut in The Avengers: Age of Ultron. The heroes' appearance surprised when they found Hawkeye has a wife (Figure 4.5). This fundamental nature of the cinematic image is important here, but if it is a kind of filmic image all data on the space is flushes with the audience. There are no other views or shots when a camera roving around the room, to the nature and the most essentials for spatial description. And, it is in the section, a poignant revelation should happen bombard the audience with new ideas. The poignant image do not waste time to improve the story. Instead, everything must be said, is in an appropriate manner, to the point and without eccentricity in the act of description.



Figure 4.5: The heroes as poignant image https://diaryofamovieaddict.wordpress.com/tag/theme-movies/

It is near areas that are at work within the moving image. But, the story could not the build-up to reach the scene with an emotional depth. It can only be expressed as Poignant.

4.2 THE PROCESS:

By documenting the implementation of the results of the previous analysis it can create a digital animation. A paradigm for the practice is developed by the concept of sphere of perception with the producer, the architect and the spectrum of techniques.

4.2.1 Spatial narrative:

Discussion: spatial story is a kind of portraying the forms and the development of spatial temporal experience itself but cinematic or "Archi-virtual." It is the control of forms to clarify certain human cognition in understanding, communication and recognition of such productions. As descriptions of the places, landscapes and topography clarify emotions from the audience of travelogues. Spatial description has occurred in the cinema, since the preparation of this spatial temporal confusion. Whether cinema was as a dramatic story medium or an experimental form, the spatiotemporal potential, impact and thus new space for human existence and imagination is not fully understood.

Narratology, is the study of narrative influences how human culture, the investigation must, as space is unfolded and represented in the cinema, to the continued use of these spatial-temporal perception through cinema. As a result of this new vision is the architecture to produce a narrative of the cinematic space area as an expression of cinematic value for the viewer. With the development of cinema as narrated mental models of worlds and virtual architecture, these simulated multiverse constructs are test-driving the chances of existences through consolidation of physical and virtual reality. In turn, the experience of the world in an increasingly complex sensorium. Spatial narrative is to allow for a substantial guide map, the growing experience aspect to stay, precise and comprehensible on cultural, social, affective and layers. Spatial

narrative strategies as a form of association, can be alleviated from the existing theoretical framework, is the large number of space images.

The technique: the space itself can mean something that the viewer understands just on a sensory level, more than the use of languages. Various types of space have different sets of values for the spectators. These stories describe exactly how effects are produced, and enter a record of improving complex sensorium in the world of realities merged. The projection of the plan described in this techno-cultural reality. In addition, three aspects of spatial narrative strategies arise; namely, encapsulation, spatial imagination and the affected area. The position of the camera creates the merciful glance of the world. For example, Tony Stark shows Bruce Banner Holographic representations of J.A.R.V.I.S. (Paul Bettany) and the AI as manipulation Structure of Loki the scepter. He sits J.A.R.V.I.S. (Figure 4.6) to work on combining the operating system code structures and ultimately Ultron comes to life - still just as code at this point. Frequently it can be like a rhomboid, and at other times a sphere. Between each of these griddles are these tiny compounds have energy light, such as Plasma Light.

In a certain way, a spatial narrative focuses on the description and the appreciation of the represented space for the viewer and directs the eye to see, space again, not as a backdrop for drama, but as possible locations of the drama. has the environment a story that corresponds to in the literature and in the travel book of mental greatness of the state of the human mind; landforms are concentrated expressions of a state of being in a particular space-time.



Figure 4.6:Holo-J.A.R.V.I.S, Holo-Ultron in Avengers: Age of Ultron http://www.animation-boss.com/avengers-age-of-ultron-behind-scene.html

4.3 Visual Effects:

Visual Effects-driven movies on a lot checking in mainstream film criticism. Critics omitted to focus on impacts rather than history. Most visual effects shots are very complicated; they contain many layers and elements. In reality, motion picture projection itself is a form of visual tricks. The film actually begins with such effects in the earliest time. The serious dramatic tone and realism this both in its visual aspect and behavior and in the way in which it is integrated and combined with traditional live action (high definition, high fidelity) the filmmaking settings with live actors. A number of innovative visual effects techniques have been used in the production (figure

4.7).



Figure 4.7: Visual Effects in the movie by Industrial Light & Magic http://www.flickeringmyth.com/2012/06/fully-assembled-making-of-avengers

4.3.1 Method Studios:

Discussion: Avengers: Age of Ultron the highest units of VFX shots than any other Marvel series. It was considered the most ambitious film so far (Afzal, 2014). Method Studios on the Vancouver, Los Angeles and London work delivered 314 VFX Shots for Avengers: Age of Ultron in a period of 3 months. Often Method Team are working on CG elements to digital environments and more on the film VFX Supervisor Chad Wiebe, Olivier Dumont & Simon Carr management team at Method Studio Www.animation-boss.com, (2015).

In the opening fighting sequence of the movie, innovative artists in the studios method mixed Computer Graphic tanks with live action to generate soldiers full-scale battle image. Method team also produced the signature shockwave effect of superhero Thor's Hammer, an effect of the previous film, which was revived for the battle sequence for better transmission of the sheer size of the hammer.

The Technique: it has requested method, fully develop and produce on the inside of the magnificent new Avengers training aptitude test that they are below the image. Method team created training address on CG. The Avengers set characters from the original and they are performed in the graphical environment Computer Www.animation-boss.com, (2015). Method Studios VFX disruption images and a marvelous FX reel from their pioneering impressive work on Avengers: Age of Ultron.

Method of artists and cultural workers from throughout the world (Vancouver, Los Angeles and London) to deliver all collected forces 214 shots in three months for Marvel's Avengers: Age of Ultron. The team, which more than 250 artists and was led by VFX supervisor and VFX Producer Chad Wiebe Christopher Anderson in Vancouver, 51VFX Supervisor and VFX Producer Olivier Dumont Michelle Machado in Los Angeles, and VF Supervisor Simon Carr and VFX Producer Lorna Dumba in London - each described failure that a precise and excellent views in the production of Avengers: Age of Ultron.

4.3.1.1 Territory studio:

Discussion: Innovative Team in the area studio produced 200 plus screens and 80 minutes of exclusive animations for The Avengers: Age of Ultron. In the movie when Tony Stark and Bruce Banner try to jump-start a dormant peacekeeping program called Ultron, things go horribly wrong and it's up to Earth's mighteous heroes to stop the villainous Ultron from enacting his terrible plans.

In Avengers: Age of Ultron, territory Studio worked closely with production designer Charles Wood and the art department, to draw up a unique visual language to support Whedon's dark and gloomy vision for the film and reflect the lonely characteristics of personality in history. The challenge was an unusually horizon of realism to the beleaguered heroes and their technique.

The Technique: Territory expressed advanced visual identities and the user interface for the technology in Avengers Tower, stark Lab and Banner's Research Lab, the newly introduced Quinjet aircraft and parameters of the evil Baron Von Strucker and his fortress, and Dr. Cho, who's leading laboratory and supports the Avengers in history (Www.animation-boss.com, 2015).

4.3.1.2 Trixter studio:

Discussion: In all, Trixter processed 294 shots for the main sequences and parameters within the age of Ultron and a further 106 for his followers for a total of 400 shots.

The technique: Here is a list of their shots, assets and animations:

• Concept and look development for Ultron Mark I and the Iron Legionnaires.

- All shots of Mark I and the Iron Legionnaires in the "Party Fight' sequence (140 shots).
- Worked on character creation and animation of digital doubles for Quicksilver (+ speed effect FX), Exo Hydra Soldiers, Captain America, Iron Man and FX of Scarlet Witch's magic power.
- Various environments and digital assets. Trixter produced the VFX for the iconic "Party Fight" sequence, which sees an Avenger cocktail party suddenly interrupted by the story's robotic antagonist, Ultron Mark I.

Following Tony Starks foray into a A.I. Peacekeeping soldiers of the robot called legionnaires Mark I Self-assembled and planify with his robot army to destroy Stark and The Avengers. The Mark I is the first compound from Lens and James Spader's mocap and voice-over performance is greeted as an exceptional work for the diabolical, bionic nuisance blog.digitaltutors.com, (2015).

Trixter's CG supervisor, Adrian Corsei clarify that the Marvel Priorat gave the Centre some general concept images for the Mark I elaboration. Based on these concepts, Corsei's department of 25 stars in the form of an asset with ZBrush. They imported it into Maya, and a rapid rig was built and the mocap studio, Imaginarium. There, the model has been used to promote the development spader its performance in real time (blog.digitaltutors.com, 2015).

The studio was also for the procurement of M-robot soldiers, legionaries. For Corsei and his CG team, a challenge arises from Getting Started construction of the army, made up of 35 props in one scene to take the Avengers to the army of the Legionaries. Animating such a large army of robots AI is very complicated. However, since the legionary army is basically blew through the heroic group Trixte's team had to build in the battle sequence numerous layers of damage to the robot "frames (blog.digitaltutors.com, 2015). Trixter used a wide range of software on your shots that Maya for modeling and animation, Mari for texturing, nuke compositing, rendering and Katana for Houdini FX. A major change in the system for the Trixter r project was the decision to switch to Houdini for VFX work. First of all, the team employs a mixture of 3ds Max along with blog.digitaltutors.com, pluginslikeFumeFX (2015).

Trixter's Compositing Supervisor, Dominik Zimmerle, clarifies the particularity of how these heroes were made. "Pietro's Speed Lines or trails were a mixture of the photographic trails, which came from the photographic plate, and the visual effects. Both were mixed together. The first step was to create a slow motion plate (120 fps 72 fps, etc.). This was based on the needs of the shot. They were then to produce along with numerous techniques in Nuke the first smoothed trails from Pietro blog.digitaltutors.com, (2015).

4.3.2 Green screen or Blue screen:

Discussion: Only with the coming of the "blue screen color difference process", more a blue background and a series of multiplying copies of the original shot, the line image, the technique has been improved enough to really plastically results. With the actual digital cable remove, this job has become easier and safer as a starting point the last days as an actor were to drift fine music wire, more likely, than to break the thicker.

The technique: The use of motion capture and green screen technology in special effects (figure 4.8), the directors to film needed an actor in a mixture with the green screen and then change the 'green' with the manufacturer. This consent can be controlled for the production and the filmed reality.



Figure 4.8: Blue and green screen technology in *Avengers: Age of Ultron* https://mattmulcahey.wordpress.com/2015/05/01/behind-the-scenes-the-avengers/



Continued figure 4.8: Blue and green screen technology in *Avengers: Age of Ultron* <u>http://www.theverge.com/2013/1/10/3863814/avengers-visual-effects-reel-reveals-how-</u> <u>ilm-built-a-fictional-nyc</u>

Using this process, the directors were eventually develop capable, the introduction of separate characters in a film of the body, using techniques and technologies, both share the strengthening combination of temporal and spatial, with a no precedents, these simple techniques are in production, only on a very large scale. Avenger: Age of Ultron in an admirable example (figure 4.9).



Figure 4.9: Green screen in Avenger: age of Ultron(2015) http://digitalsynopsis.com/design/movies-before-after-green-screen-cgi/

Other CG elements in Avengers: Age of Ultron, the background buildings, sky, cars and people. These effects are the best shot in the film, because it includes photorealistic CGI together with relevant pragmatic elements. This shows how the disappearance of compositing can produce a shot that creates a sense of realism, but is based on detection of multiple images process that inspires a sense of unrealism.

4.3.3 Motion in Computer Animation:

Discussion: Motion capture is a technique that has some links to illustrated by Lev Manovich, namely that the universal capture. (Projecting AProcess Akin) Universal capture works by shooting physical elements and then 'mapping' the imaging footage on a digital object, creating an unreal simulation of a physical object. Motion Capture also includes physical objects in the unreal world, but this does in a variety. By using system with multiple cameras at different angles of light captured in a traditional and novel ways (www.ign.com, 2015). Motion capture data provided the motion to reproduce the character and with the human face background for work with the animation team. It should be noted that "performance capture" is a term that is often employed in this context, but in its establishment, going to work exactly in the same manner as motion capture. The only difference is that the performance capture.

The technique: Capturing infrared light, multiple infrared light-sources and suits covered in dots reflecting this infrared light. All the data the cameras capture is then fed into a computer where it is interpreted into data corresponding to the movement of the points an used to move virtual objects. For example, an actor moving his or her arm will move the dots on his or her suit. That movement is then transferred to a digital arm by have certain points on the digital arm move just as the physical arm does. The digital objects that are moved by this process can even include virtual lights or cameras.Motion Capture indexical works the exact same as live action film, it does not light where it differs in the exemplary aspect of the character. While, as has been clarified, a photo "has" as its object, look just the movement of the digital object in motion capture has the reality. The digital object itself could be anything. It is not necessary that the digital object should look like the actor that moves. The animator's role in motion capture is to clean or parameter data and the models that are moved by the entered data. In this way, motion capture is closer to the puppet show (which is on film, live-action). An example can be seen in Avengers: Age of Ultron, where the actors act as Ultron (figure 4.10), and Thor with Hulk (figure 4.11). Mark Ruffalo also plays character as Hulk, among animators (figure 4.12).



Figure 4.10: Actors imitate Ultron in film *Avengers: Age of Ultron* https://mattmulcahey.wordpress.com/2015/05/01/behind-the-scenes-the-avengers/



Figure 4.11: Thor with Hulk in film *Avengers: Age of Ultron* <u>http://digitalsynopsis.com/design/movies-before-after-green-screen-cgi/</u>



Figure 4.12: Mark Ruffalo plays character as a Hulk in film *Avengers: Age of Ultron http://digitalsynopsis.com/design/movies-before-after-green-screen-cgi/*

Overwhelming many (if not all) motion capture films contain a substantial amount of key frame animation, but many key frame animators have no positive position on motion capture. In fact, if the camera is unreal directly through physical exercise and unreal parameters controlled by physical actors, the indexical character of the motion capture is in addition to the live-action film.

The data collected can then be introduced to computer-generated characters existing in the unreal world. This result in the animation is not only less timeconsuming and create intense, but also probably more realistic. Although several effects and private companies have their own equipment and means for motion capture, there are also motion capture suits, cameras and software. The combination of an earlier model unreal space and real-time rendering means it is conceivable to obtain feedback as performer moves through the unreal world.

The first time we see Ultron in the film is during a big party the Avengers are hosting (Figure 4.13).



Figure 4.13: Ultron in the film is during a big party the Avengers http://www.techinsider.io/james-spader-ultron-without-visual-effects-2015-9

And here's how Spader's Ultron looked to the cast (Figure 4.14):



Figure 4.14: Spader's Ultron looked to the cast http://www.techinsider.io/james-spaderultron-without-visual-effects-2015-9

It's kind of funny to see everyone dressed up in their finest while Spader is walking around in a capture suit. Refer (Figure 4.15):



Figure 4.15: Spader's Ultron looked to the cast http://www.techinsider.io/james-spaderultron-without-visual-effects-2015-9

The selection criteria are based on a technical, geographical and cultural matrix. The technological developments in the production of motion picture show a change of cinematic Spatial View because the nature of the images can be improved by increasing the size of the screen, the method of presentation and cinematic special effects for the construction of the artificiality of the cinematic space. Digital technology has completely played a major role in changing the method of creating the moving image and the quality of such images displayed on the screen.

4.3.4 Lighting:

4.3.4.1 Quick Quicksilver:

The discussion: Houdini FX mixes of higher performance and dramatic, simple use for producing a strong and 3D experience to visual effects artists create movies, commercials and video games. With its procedural node-based workflow, Houdini enables you to produce more content faster and with less time consuming and improved delight flexibility in all your creative work. Houdini is perfect for visual effects artists and technical directors with its pragmatic and flexible environment. Houdini FX includes a complete toolset for Studios for those who want to try other tasks such as lighting, animation or procedural modelling. The event: Pietro Maximoff / Quicksilver (Aaron Taylor-Johnson) and its double Wanda are the results of the experiments of Hydra's Baron Wolfgang von Strucker (Thomas Kretschmann).

In the case of Quicksilver, he shows superhuman speed. Trixter who had done previous work on the appearance of this effect for a day in order Captain America: The Winter Soldier, sharing the views of Quicksilver's streaky phenomena and share with other dealers. Trixter formulated the many methods that could be used, including Barred from cameras, superior speed, clean dishes, pans node and a digital double plus mixtures to live the Quicksilver (figure 4.16).



Figure 4.16: Quicksilver and his photographic trail http://blog.digitaltutors.com/behind-vfx-trixters-age-ultron/

The technique: Ultimately, Townsend and Whedon preferred resembled shoot things "at 6 fps, with a wonderful open shutter angle, photographic, creamy effect - not only the direction of the light, but a very flexible and malliable effect behind the things that are move fast in order to achieve this, that with our compositing device, it has almost shoot everything in high-speed -. at least in the foreground, namely Quicksilver -. with an Arri Alexa varies between 120 fps and 72 fps (figure 4.17), rely on the tries to shoot an empty plate or backgrounds (www.cgw.com, 2015).



Figure 4.17: Quicksilver in action http://www.chicagonow.com/thinkdifferent/2015/01/predicting-the-plot-from-marvels-second-avengers-age-of-ultrontrailer/

One of the fundamental elements of the look of Quicksilver is what as the "photographic tracking shots, and all the time. Chris Townsend did shoot many test before the production step explains Trixter is Alessandro Cioffi. "He has found that the shooting at 6 fps with a large aperture and some quick movement that will allow him to present longer and softer motion blur track the object moving in the camera. This was re-produced in compositing. With immense speed photography, ask a lot of images available, it could re-like effect, so it was very long and malleable Vector trails - a mixture with the trails in Houdini and mix-use with Comp tricks it has many frames per second film material. For example, 120 fps or 72 fps, the produce on the needs of the shot. This photographic way, sometimes, when the frame was hard or if we had a higher frame range, it could be used only the plate with the inscription Pietro's and produce an optical trace with NUKE agents such time echo frame interpolation. It is then necessary to mix these motion trails in the main planes, bring in Pietro's True Colors in the trail in both directions, so that there was a real trail on the whole thing.

The team first encounter Quicksilver in a wintry forest. Sometimes the high frame rate footage is not encompassing the entire interpolation. It is a necessary technique for maintaining Pietro's trails and re-tracks it in to the camera and felt even original in the scene. This consists of a set of masking, Roto -Scoping, keying - even on the Roto-automated geometry to pieces by Pietro and bring him back to the plate. They put his trail on cards and track it in again into the shot. Each shot was clear and each had its own requirements (figure 4.18).



Figure 4.18: Quicksilver helps out Cap during the train sequence http://www.recenzent.com.ua/avengers-age-of-ultron/

4.3.4.2 The magic of Scarlet Witch:

The discussion: Visual Effects Breakdown – Marvel Avengers - Industrial Light and Magic the Avengers - was the major challenges putting together the "tie-in" shot during the third act of the film. Instead frames; this single shot is calculated in minutes on the screen and is one of the longer effects shots in the film. Iron Man, Captain America, Thor, Hulk, Black Widow, and Hawkeye - Raid a HYDRA outpost in Sokovia where Wolfgang von Strucker inspected experiments on Loki the sceptre. Two of the Hydra of subject twins Pietro and Wanda Maxim were awarded super-human abilities by the sceptre; Pietro can at Super speeds while Wanda has psychic powers like telekinesis and hypnosis.

The Technique: It includes both practical special effects and extensive digital visual effects of ILM. The New York City, is the setting for this shot, and virtually the entire Alien Invasion was generated while computer with the visual effects team at ILM

(www.awn.com, 2015). The event: Pietro's twin wanda maxim off / Scarlet Witch (Elizabeth Olsen) causes disaster among the Avengers and, Ultron's Army, with their telekinetic powers and radiate magic. Again, Trixter Split sight of the red Maxim off energy and other investments consisting of ILM and Method Studios, expanded on the work (figure 4.19; figure 4. 20). The results of the mixing of many signs of Houdini and with additional interactive light rotosin NUKE (digitaltutors.com50). NUKE is a node-based digital compositing application created by the foundry, and for film and television after the production step (wikipedia.org). Wanda's Brain Control was the result of the mixing of multiple signs of Houdini and other interactive light rotos in nuke (blog.digitaltutors.com, 2015). Software was used by Nuke, Katana, Houdini, Mari, Maya, Mocha, PRMan, Arnold, MotionBuilder, 3d equalizer, Adobe Photoshop.



Figure 4.19: The magic of Scarlet Witch <u>http://screenrant.com/avengers-2-trailer-vision/</u>



Figure 4.20: Sequences to make effect of the light http://blog.digitaltutors.com/behindvfx-trixters-age-ultron/



Continued figure 4.20: Sequences to make effect of the light http://blog.digitaltutors.com/behind-vfx-trixters-age-ultron/

The Scarlet Witch's powers of mind control and creating its "aura" also had its challenges. "Visually, her powers were an interesting challenge because they could have both a subtle and profound impact on the plates," Zimmerle explains. "They created a lot of distortion, and you can see it quite easily at some points and others not so much. Wanda's mind control was the result of mixing a lot of elements from

Houdini and involving additional interactive light coming from rotos in NUKE." (http://blog.digitaltutors.com/behind-vfx-trixters-age-ultron/)

4.3.4.3: Light effect in Thor:

Discussion: Lighting plays a crucial parameter when creating the environment in a movie. The amount of light and the direction of the light source can make sense to give the viewer of the film. For example, the lighting is used to control the time of day.

The technique: The lightning actually shows more of the "God of Thunder 'aspect, and really using his skills (www.moviepilot.com, (2015) (figure 4.21). Using Maya and After Effects as their most important tools for this effect was an essential part FumeFX to produce our pipeline since its first release FX team that flowing simulations for the tornado effect and cloud effect with our updated FumeFX pipeline that we previously not often during our work on Thor (www.artofvfx.com).



Figure 4.21: Thor and light effect http://moviepilot.com/posts/2860305

The visual effect some time not used which use normal light as project on artist (Figure 4.22). The main light source comes from above the character. It is used to remove shadows produced by the key lighting. It can also create the illusion of a bright, sunny day but in this movie was used to increase the effect for power of Thor.



Figure 4.22: Special effect with Thor http://panels.net/2015/05/18/civil-war-willdivide-marvel-cinematic-universe/

4.3.5 VFX and compositing:

The discussion: digital techniques aim at creating synthetic elements to say as an aid, certain stories, films are not, in principle, applied depending on binary oppositions (Real / Fantasy), and new digital media, as always, if not in the fee to existing cinematic methods and types of realism. It is therefore conceivable to locate VFX and compositing as much as actual sets and locations within the staging, since these "studio construct Settings". Therefore, you should transmit the impression of realism, so that the viewer feels they see events that could happen in real life and were photographed on the spot.

The technique: an especially uses a range of Mattes, writing male and female components, really in the visual form. The male Matt range is used to the foreground element in the background. It appears as a black figure, and is really a transparent area in which an image can be injected. This is on the background via the optical printer, but remains underdeveloped. The process is now reversed to create a female matt, wherein the background is now black / transparent. The opaque surface of each piece of film allowed to be exposed to no more. The final image is generated by showing the individual elements of the optical printer, with each section, the accurate images in its transparent regions. The precise matte allows separate images are mixed together, but not to flood. Also presented numerous VFX and compositing practices, so the importance of research into aspects of realism and should constantly pressed the focus highlight the flexibility of the cinema.

4.3.6 Three dimensions (3D):

4.3.6.1 The Hulk:

Discussion: computer animation or CGI animation is to generate the procedure, animated images using computer software. The overal term computer-generated imagery includes both static scenes and dynamic images, while computer animation only refers to the moving pictures. Modern computer animation usually uses 3D computer graphics, though 2D computer graphics are still for stylistic, low bandwidth, and faster real-time rendering. Sometimes the target of the animation is the computer itself, but sometimes it's with another device, such as film (Https://wikipedia.org, 2016).

The technique: After ILM VFX supervisor Ben Snow, the hulk is 50 percent more aged than in previous Avengers movie, and he is more dynamic. The design of the hulk was largely the same, although even angrier and more powerful. It always greatly increases the resolution and redesigns it from the inside out. They have a complete skeleton and skull, which do not already exist. the muscle was in this movie, hulk reconstructed accurately, rather than a simulation tool, you can see his muscles moving under his skin is more real (figure 4.23).

This time around, a blend of motion-capture and animation were used by effects studio Rhythm & Hues, with director Leterrier pushing to bring the man and the monster closer together by using more of the former and less of the computer-generated latter whenever possible.

Along with shifting their approach a bit, the studio also opted to base this new version of Hulk on football linebackers instead of personal trainers, using motion-capture technology to mimic their fast, brutal, and aggressive movements. Norton and co-star Tim Roth, who played the equally monstrous CGI villain Abomination in the film, also got in on the action by filming more than 2,500 different takes of their characters' movements in front of 37 digital cameras. The pair also used phosphorescent paint and lighting techniques to record some of their facial expressions and mannerisms

Along with making this version of the CGI-driven Hulk more expressive facially, significant attention was paid to the way Hulk's muscles and skin reacted to both internal and external elements throughout the film, with computer programs created to mimic inflation of muscles and the flushing of skin.



Figure 4.23: Hulk was rebuilt the muscle system http://www.digitaltrends.com/gaming/the-avengers-at-the-oscars-building-a-betterhulk/

Most of the studios animation and rigging base is elaborated with Autodesk Maya. Simulations are made in Maya and the studio's proprietary tools which soft body dynamics and hard body flexibility (www.cgw.com, 2015). For several simulation and for meat and muscle system, they used proprietary solver. The skin simulation or muscle-driving simulations were carried out mainly with internal matters (figure 4.24). The group uses Pixar Render Man for creatures, and Chaos Group's V-Ray is used to represent the atmosphere (www.cgw.com, 2015).


Figure 4.24 ILM worked on new muscle and skin simulation for Hulk http://www.cgmeetup.net/home/making-of-hulk-the-avengers-industrial-light-magic/



Continued figure 4.24 ILM worked on new muscle and skin simulation for Hulk http://www.cgmeetup.net/home/making-of-hulk-the-avengers-industrial-light-magic/

For The Avengers, new Bruce Banner actor Mark Ruffalo played both the human character and the monster in front of the camera throughout filming, relying on a motion-capture suit and four dedicated, motion-capture HD cameras (two for his body, two for his face) to bring man and Hulk closer than they've ever been on the screen. ILM was given a second chance at bringing the character to life, and started by approaching Bruce Banner and his alter ego as one character instead of two (http://www.digitaltrends.com/gaming/the-avengers-at-the-oscars-building-a-betterhulk/).



Continued figure 4.24 ILM worked on new muscle and skin simulation for Hulk http://www.cgmeetup.net/home/making-of-hulk-the-avengers-industrial-light-magic/



Continued figure 4.24 ILM worked on new muscle and skin simulation for Hulk http://www.cgmeetup.net/home/making-of-hulk-the-avengers-industrial-light-magic/



Continued figure 4.24: ILM worked on new muscle and skin simulation for Hulk http://www.cgmeetup.net/home/making-of-hulk-the-avengers-industrial-light-magic/



Continued figure 4.24: ILM worked on new muscle and skin simulation for Hulk http://www.cgmeetup.net/home/making-of-hulk-the-avengers-industrial-light-magic/

It is used motion capture in begin then the modifying by 3D program to achieve final shape. The render plays significant role in the many movies (Figure 4.25).



Figure 4.25: Before and after the render in the movie http://sploid.gizmodo.com/behind-the-scenes-footage-of-avengers-2-shows-how-goofy-1698029033

4.3.6.2 Iron man:

The Discussion: 3D animation consists of multiplying properties of a 3dimensional scene defined in numerical quantities. can distinguish a 3D model of its properties such as position, shape, rotation, and surface. An animated 3D scene is usually defined by the change in this numerical attributes through time. Apart from 3D objects, a scene consists of a camera (point of view) and lighting, can also be animated.

The technique: Although ILM was able some of the assets of Iron Man Mark 43 suit that was at the end of Iron Man 3 and constructed by other facility (figure 4.26), the artists but also faced with the "Hulkbuster" "Iron Man" Detective Suit and new brand, Iron Man's latest production. But "Iron Man" is amazing suit pales in comparison to the job ILM in production / Prime (www.cgw.com, 2015). Especially in the 3D animation this interpolation in the form of 3-dimensional Bezier curves (paths), as a number of checkpoints, permitting for interactive control of smooth 3D curves showed in Iron Man.



Figure 4.26: Iron man before and after the render (www.cgw.com, 2015)

"The Iron Man suit seen at the start of Avengers is simply the Mark VI seen at the end of Iron Man 2," notes Janek Sirrs. "There's an established handover of the latest and greatest suit from one Marvel movie to the next. But toward the end of Avengers, the Mark VI is replaced by the new Mark VII version. Marvel's in-house design team was responsible for the look of the Mark VII, but we incorporated some specific features/capabilities at Joss' request. For example, Joss wanted Iron Man to have the ability to hover, and engage in aerial combat, without his hands being part of the flight system (figure 4.27), basically, the ability to shoot and fly and the same time. The trick was to preserve the iconic look/profile of the established Iron Man suit while making the new suit feel like a logical update from the previous version. For example, the new suit also incorporates some aspects of the portable 'suitcase suit' seen in the Monaco sequence in Iron Man 2." (http://www.flickeringmyth.com).



Figure 4.27: flying Iron man http://www.flickeringmyth.com/2012/06/fully-assembledmaking-of-avengers/

4.3.6.3 Animal Logic:

The Discussion: Casting Animal Logic: "Animal Logic's amazing to create skilled, things they've never seen before, and they are aware of storytelling and the fluidity of the interface and the way things are constantly moving in Marvels universe include a lot of the graphics and the stories of the visuals and animal logic has a great affection for the stuff. Artist at animal logic examined first concepts with Townsend for as an operating system for both JARVIS and ultimately Lens (James Spader) would see. JARVIS ' holographic display was realized as orange series of arcs (figure 4.28).



Figure 4.28: J.A.R.V.I.S. and Ultron holograms http://www.animationboss.com/avengers-age-of-ultron-behind-scene.html

In one of the scenes of the film, Tony Stark shows Bruce Banner Holographic representations of JARVIS and the AI as manipulation Structure of Loki the sceptre. This job was terminated by Animal Logic (Www.animation-boss .com, 2015).

The Technique: the final holographic eyes were mainly in Maya and Houdini, the latter bokeh mainly for procedural implications with profound compositing in nuke, which helped to add to the actor under the holograms, artist, worked for more effects and maintained to a short depth in many of the shots. it made sense for us to use, Houdini as a design tool, and run through to the last use (www.sidefx.com, 2015). Then there is the brilliant harmonics of shimmer and spot and aberrations to the public that this is a projection system, instead of only one object (www.fxguide.com, 2015).

Cinema 4D (C4D) helped "Avengers: Age of Ultron 'to life on the cinema. MAXON CINEMA 4D animation inspired art, VFX and Avengers: Age of Ultron. MAXON, the main developer of professional 3D modelling, animation, painting and rendering solutions, today announced that dominant innovative, design and visual effects. Using the camera and the tracking data in Cinema 4D allows us to import the church model (provided by ILM) and further developing the schematic appearance of the key component we were intuitively able to animate and enrich in After Effects. At the age of Ultron our 3D visuals make to tell a story in the blink of an eye, while many details for a close control of a cinema projection. Cinema 4D allowed us to think like designers work quickly and with more innovation and push us technically to discover new techniques. Its tight workflows closely with other agents such as After Effects is also an important aspect when working against tight deadlines, allowing us an element during compositing and animating constantly (www.reuters.com 2015).

4.3.6.4 Creating Holograms and Cyberspace:

Discussion: Its shots need to see, in intelligent holographic systems with a sense of deep complexity, action and reaction, and power transmission. Houdini's procedural workflow she gave a statement they could use to carry out the effect of the animation with audio signals and segments respond in shape with the animation of the surrounding geometry.

The technique: With this procedural workflow came the casual random event that is perfect for a save. Create Most their job the JARVIS hologram Nokton hologram and complete CG shots of cyberspace had finished Houdini to procedural model, animate, spot and render. It was crucial that you worked as accurately as possible, with no time losing unnecessary simulations. Animal Logic employs a wide range of Houdini geometry features including volumes, point clouds, curves and a very free use of volumes (VOP) and Go BREAKING wrangle surfaces (SOPs). Some of the new features in Houdini tantalize 13/14 as the ability to create and delete geometry were extremely helpful. Because the holograms do not need the use of complex lighting in

the traditional sense, a lot of their "shading" was produced interactively with Houdini surface Operators (SOPs) to manipulate on the setting of attributes that color, turbidity and other utility parameters. You create custom tools to illuminate the holograms interactively in SOPs utilizing Houdini lights, with the lights and Reflection baked in the Pattern mode. This meant that what she saw in your 3D image window was close to the final power that allows you to emphasize fast with very fast making on their farm (www.sidefx.com, 2015).

4.3.6.5 Houdini Digital Assets and Animal Logic:

Discussion: These are periodically reviewed and system kick out of their Enterprise-wide Asset Management live in Houdini scene to work numerous artists simultaneously on separate tasks on the same and could visualize, reference, and extract data from other artists anytime. As a general practice, which are Houdini artists at Animal Logic publish their valuable utility program as versioned Houdini Digital Assets (HDA), so you can share with your colleagues simply by clicking a button (www.sidefx.com, 2015).

The Technique: The Integration of Animal Logic's proprietary asset system and pipeline in Houdini depend mainly on digital assets. Outsider assets are seen when imported into a procedural error, allowed their Houdini artists and change the view of assets such as props and sets. Instead, only to you In modern files, we work in the 'fx containers', are mainly subnets packaging to classic structures of data (geo, CHOPs, SHOPs, ROPs) relevant for a particular task in a given shot or sequence.

4.3.6.6 Rendering with Mantra:

Discussion: Houdini procedural workflow were artists at Animal Logic with an obvious advantage in this project, as it allows them to produce and measure a wide

range of visual parameters for the appearance of these effects, providing tools to quickly share with colleagues helpful tools, and run your shots with Mantra. Because of Houdini's procedural approach, Animal Logic had to really dig the leisure of flexible time and examine all options for visual images that normally. As difficult and abstract So often, VFX artists are simply planned reproduce shot for shot sequences while previz with a tiny room for innovative expression. The Avengers: Age of Ultron shots gave the possibility to use VFX as storytelling device to improve and ideas from concept to implementation step on the cinema (www.sidefx.com, 2015).

The Technique: Because of its tight integration and manipulation in Houdini, Animal Logic chose mantra to all your shots in the Avengers: Age of Lens. You can add custom properties easy to produce, on the geometry and made it through easily and quickly or by as AOVs for comp who see it as a great time saver. The facility for export AOVs per-light and per component is also great. In situations like this, it's not just a matter of an additional improvement in elaborately - in other more rigid pipes, although it is conceivable to make small changes such as this, you are usually hard that you harder than their value. Having that accessibility and integration makes things conceivable in the sense that it is not lost, do half the time, little experiments (www.sidefx.com, 2015).

4.3.6.7 Ultron Mark I:

Discussion: Casting Trixter "Trixter are valuable this real art concept and taking into account that all the way through the modeling to embelish and a nice animation. Mark I is not original version of him from many bits of " Iron Man "and" Iron Man "fits for creating this almost monster. They also worked www.fxguide.com, (2015) in collaboration with James Spader's performance mocap in his final appearance, M Prime (figure 4.29) is a complex metallic robots spectacular athleticism,

flight and fight, but with a high degree of elegance - a feature of the spading machine's performance, even ILM built the asset and completed the lion's share of m Prime shots, common among the merchants, including double with another negative for Seoul chase sequence to produce the number of rigging m Prime is colossal www.fxguide.com, (2015).

The Technique: Trixter locked geometry for R Mark I in Zbrush and then pursue modelling and animation in Maya (the animation was by Simone Kraus), with lighting and rendering is performed by Katana with render man (www.fxguide.com, 2015).



Figure 4.29: Ultron Prime http://www.techinsider.io/james-spader-ultron-withoutvisual-effects-2015-9

In the scene, Ultron Mark1 is only half assembled. He hasn't yet taken on the form of Ultron Prime (figure 4.30), his ultimate iteration, so the film's key creative wanted to create a spooky and creepy appearance for him. Getting the right look took a lot of collaboration. Whedon and Townsend were both open to suggestions for Mark1's look, allowing Cioffi and his team to take a big part in the creative process. They approached it from a cinematic perspective adding lighting, modeling, and animation that would underscore Spader's performance.

They tried to help [Spader's] performance by providing some additional drama through lighting. The set looked slightly like a stage. The first thought they had was that it looked almost like a theater, so they created a very theatrical light that gave the character a backlight or a slight three-quarter ring light. He's metallic; he takes light from the environment, but there's a very strong key light all the time that gives a shape to his body and defines his evil look. His face is always lit from two sides; these elements created a very strong, diffused feeling to the scene.



Figure 4.30: Ultron Mark1 http://blog.digitaltutors.com/behind-vfx-trixters-age-ultron/

4.3.6.8 Envisioning Vision

Discussion: Digital VFX used to modify partially and replace the physical performance of the actor, whereby the shape is invisible. In addition, a detail that is just in many other areas, from VFX compositing backgrounds and create an association of content-rich digital elements, and often replace the human, material and solid aspects of a film constitution (www.awn.com, 2015).

Vision's face and skin sind2eine complicated system of plates, layers, valleys and edge-worked to produce virtually inconceivable (figure 4.31). Lola's solution involved creating a 3D structure on the top of Paul Bettany, to clarify the skin, the shape and cues. They produce the confusion of textures, panels and skin surfaces in compositing. The biggest challenge was that had his skin and metal alloy characteristics all the time keeping an "indefinable" quality. The material must never 'skin' or 'Aluminium' for example, but all should something in the middle.

The technique: A new interface has been created, both had qualities of skin and a more synthetic materials such as plastic. Among them, was the flower not only underline the subsurface scattering of human skin, but a bit of a magical quality as well. 3D team has a scene and object, connection to all shots [PFTrack and Syntheyes], then rotomated Paul's movements with our model and rigging with Maya and ZBrush. Every shot was then lit and textured 3D supervisor Carlos Fueyo. The shaders were always strived in Maya, the target of nondescript materials. Claus was pleased with the cinematic end result.



Figure 4.31: Paul Bettany as Vision http://www.animation-boss.com/avengers-age-ofultron-behind-scene.html

4.4 Conclusion of the analysis:

4.4.1 Use Visual Effects in this movie:

Discussion: There are three reasons for the use of visual effects in a film: The first is when there is absolutely no pragmatic way to film the scenes described by the script or required by the director. The second reason to use visual effects comes to fore when you could do the scene practically, but doing so might place someone's life at risk. The third reason arises when it is more cost effective or practical to utilize a visual effect than to film a scene for real, due to issues of scale or location (or both).

Lev Manovich (2001), the digital image as characteristics of the photographic image that they are unreal in nature deals a form of realism, but in reality. Age of Ultron has to show more character in the VFX, its powers. In addition, the type of film franchises - that the spectacle receives important, each installment has be to require more visual effects. But whether or not the number of additional VFX shots makes aged ... a superior film, remains to be seen (figure 4.32). Although, it will certainly help to bring back the world to live by the Avengers (in particular the ship's hull and R), visual effects can at times take the audience of a film, when it too obvious - even in a movie about super-heroes. Marvel Studios constantly produced fascinating stories about superheroes need to do some visual effects.



Figure 4.32: They used Cinema 4D to make some amazing simulations http://www.animation-boss.com/avengers-age-of-ultron-behind-scene.html

The technique: The technique for entering data for the generation of virtual space is already well established. Photogrammetry employs pictures of a real world object from a different point of view to create a 3D computer-generated image of a particular scene. For example, a building or room, a scan of a room or in the neighborhood with an automatic laser rangefinders offer a point cloud, which can be transformed into a 3D space, just provides a set or a range. Outsider scans are often associated with satellite information to help the large room. As the technology is strongest, the scanning technology is expected a greater utilization of it, including other applications for such processes as virtual tour. 3D modelling software such as 3D Studio MAX offers great viewpoints and animation of camera control, the endless digital manipulation.

The digital virtual mode of representation allows almost all Camera Setup as in real-life filmmaking situation; for example, the lighting, the movement and the stimulation of the camera, different lenses, or camera effects such as dissolve and filtered. But in the context of collective artistic and technical input in the cinema by several employees, the animator is not the writer or the top management. The animator is, no more than a cameraman, the document promised the virtual design sufficient for sending an obvious view of the landscaped surroundings, its configuration, and management aspect for its customers. Therefore this architectural animation sets many weights on the ability of the animation effect in a specific view of the typical multimillion architectural projects. It is cheaper to produce an operation guide enlightened by the practitioners' experience of more than a hundred year of Cinematography (helloluxx.com, 2015).

They used Realflow to some outstanding simulations for the blockbuster of the year, especially in the movie Avengers: Age of Ultron (figure 4.33).



Figure 4.33: They used RealFlow to make some simulations http://www.animationboss.com/avengers-age-of-ultron-behind-scene.html

Straight from the first frame of the movie it can see Realflow hybrido be used further to Maya N particles for the scenes. Realflow would be excellent because hybrido particles are very easy to control, and they are to simulate extremely fast, so for numerous repetitions. RealFlow is confident and fast! It has a great Details Support and the support team behind it at the next border are some of the best artists.

4.4.2 Quality of movie:

Avenger: Age of Ultron (2015), a film consisting essentially in an unreal world of digital, has more attention to skin texture and reflective lighting. In conjunction with the mocap technology for the production of its movement, the CGI character provide a satisfactory, detailed and realistic look, contextually fits with the producer's intention, a realistic-looking atmosphere and characters (figure 4.34).



Figure 4.34: Avenger: age of Ultron (2015) http://www.forbes.com/sites/erikkain/2015/05/02/avengers-review-5-things-age-ofultron-gets-dead-wrong/#3d55751713da

4.4.3 Physical effects in the movie:

Discussion: rain, wind, snow, fire, smoke, car accidents and radiation are all tangible effects, as pragmatic, mechanical or special effects. Mechanical creatures known as animatronics, prosthetic makeup as false limbs or noses and stunts as actors jumping through a window or from a burning skyscraper, are also treated physical effects. Although physical effects are produced live on camera on the basis of actual objects, are a variety of magical films. For example, what looks like snow on the screen? it could be a mixture of falling ash, foam, painted glass and pieces of paper. The building demolished by a bomb could be a 20-inch miniature, a talking lion, a mechanical doll. The stars that look like running into a burning building is actually a stuntman. And the bullet holes from a gun war were of small explosions, not real bullets. The amount of the special effects of the anticipated aged R should not be surprising Who Marvel Studios films. With the return of Iron Man, Thor, Captain America, and the Hulk (Mark Ruffalo) and the additions of vision (Paul Bettany),

Quicksilver (Aaron Taylor-Johnson), Scarlet Witch (Elizabeth Olsen) and M (James Spader).

The technique: A few examples of the variety of pyrotechnics and mechanical effects are as follows:

- Pyrotechnic smoke: This includes the colored smokes, smoke, may be netted far away, or cause smoke at the same time with an explosion or fire.
- Squibs: squibs are small electrically detonated explosive tools bullet hits on props, buildings, water, and cars. Squibs are special safeguards in conformity with small bags of bloody scene in the film create frightening body hits. There are also small size squibs for use with makeup effects for mounting on prostheses for Close-up effects. used squibs to use Fast approvals, pivots, guns, glass and poppers. Squibs are also the inauguration detonating primer cord and gunpowder.
- Spark effects: a wide range of effects sparks is used.
- Pivot gun: small tool can be used to bullet holes in car windows or glass breakage; also known as pivot Launcher. Pivots guns looks like a small cannon mounted on a small heavy metal plate with a pivoting arm, and you can multiple angles. They have a flexible end cap with a tiny hole in the IT. A Squib is located in the end cap with the cable through the hole. A small projectile from glue sand or a ball bearing is then in the tube. When the squib fisred, the projectile from the barrel and produce a hole in the glass, it was aimed at. They are frequently used in this film, the effect of bullet holes in the car windows.
- Display fireworks. Public Display type fireworks are rare of special effects teams, these include all kinds of antennas and set pieces.
- Explosion: A staple of special effects, including car explosions, where the car blast and flying through the air, the blowing up of buildings and a large dust explosions

far away to simulate artillery fire. can be prepared with or without flame blasting and stunt performer in or near to you.

• Car Effects: There are just a few of the many car effects, written in film scripts (figure 4.35).



Figure 4.35: Car effects https://mattmulcahey.wordpress.com/2015/05/01/behind-the-scenes-the-avengers/

- Miniature Pyrotechnics: This is a special art in itself. The pyrotechnics must match the miniature in scale, and the timing is usually measured in milliseconds by fast photography.
- Fire effects: burning houses, fireplaces, campfires, candles, bonfires, burning bushes, lightning, fire and many other effects are the duty of the SFX Supervisor (figure 4.36).



Figure 4.36: Fire effects and Explosions as Special effects https://mattmulcahey.wordpress.com/2015/05/01/behind-the-scenes-the-avengers/

- Special props: props that do something on the set, as Mechanical Bulls Clock, gadgets with blinking dots, retractable knife, trees, fall on cue or self-growing plants. This may imply all sorts of mechanisms of action, either built from scratch or existing items altered to work on the set in a movie-friendly way.
- Breakaways: balsa wood, furniture, windows, walls, door panels, floors, props, all types of glass, concrete or handrails.
- Cars collide: to protect roll cages, actors, rollover guns, cars with self-contained traveling flames and other effects, cable pull cars in stunts too dangerous.
- Bullet Hits and blood effects on the walls, cars, people, water, plants, concrete, or Windows.
- Bullet hits may flicker or dust wisps.
- *Flying effects:* flying and moving people and objects on cable, synthetic rope, wire cranes, parallelogram rigs, hydraulic gimbals and overhead, floor, subfloor, and through-the-wall tracks, or arrows and rockets on wires.
- There are many other effects such as artificial modeling and make up (Figure 4.37 and Figure 4.38)



Figure 4.37: Model of Hulk's hand as Special effects http://birthmoviesdeath.com/2016/07/12/mark-ruffalo-gets-handsy-on-the-set-of-thorragnarok



Figure 4.38 Make up *as* Special effects https://makeupmag.com/creating-avengersage-of-ultron-vision-make-up/



Continued figure 4.38: Make up *as* Special effects https://makeupmag.com/creatingavengers-age-of-ultron-vision-make-up/

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION:

5.1 Conclusion:

The visual aspects in a film are crucial to modern cinema which built as valid and beneficial. They have the opportunity on the verbal aspects of a story and produce informative and profound meaning. Add special effects, a layer of lust and drama in the film. Several studies highlight the ability of the media and its influence. These influences may be able to change behaviour and culture of a society, such as sex, morality, body image and drinking. There is no convincing or scientific evidence that the media affected people because of the current controversy. However, some people believe in small influence in the media and try to control others through the media. In the following study on future media effectors, it is always difficult to assess the amount of the difference between the two phenomena (such as painting and computer animation), simply because it always the case that the dichotomies such as physical and virtual imaging, or production of image and perception of the image, or as active and passive, or control and responsiveness to multiple interpretations. Saying that does not mean that all phenomena are ultimately the same or as new versions are really standardized. All art begins with some materials and voluptuous into something else on its own way unthinkable. Differences on a continuum, or the differences between technologies, or between user interfaces are significantly different. Therefore, we can conclude:

 The development of technology and science has positively influenced the continuous innovation in the visual composition and modes of expression in films: changes in the expression techniques to changes in rich materials and novel artistic illustration tools, essential rule. It further emphasizes the role of visual composition, despite technological changes, as a fundamental perpetual element in films' visual expression and effects.

- 2. The theme of the research focuses on the most important factor in improving the quality of cinematic artistic expression, systematically and thoroughly studied catalogued all the visual composition and expression of effects in harmony, balance and a judicious mix together. It can be assumed that it is. a rule with specific properties.
- 3. The composition of visual interaction in cinematic expression is the visual expression methods in all stages of creation and film production, with a combination, resonance and fuse with creative elements in a specific measure.
- 4. CGI show not in opposition to the narrative progression (CGI storytelling through the promotion of faith in the fictional reality narrative of events).
- 5. CGI provides the ability to photorealistic rendering events that never happened. It allows these things as if they were filmed, not like the way they happen.
- 6. These advances in technology enhances the ability has always had the audience in a world built for fun, feature films, but one that is new and re-imagined by increased incidence of technology.
- 7. It was found that the type of emotions can create an impact on the degree of agitation, and therefore the emotional content of stimuli may have different effects.
- 8. CGI saved a lot of time and money in the production of the film because it was not necessary to thousands of costumes, weapons, equipment, and they reduced the work of operators and other special effects in film and produce an experience comparable to an experience where the viewer is not only the film, but the film's narrative.
- 9. Special effects and green screen environment are an integral part of the contemporary producer. Therefore, it is crucial that the actor who is able to adapt to

the demands of the film and television industry. Therefore, a psychophysical green screen acting strategy, completed and operates according to the actor a larger number of process is necessary. Actors operating in the field of film and comprehend benefit of this model, as complete film deal with technical demands of green screen.

- 10. 3D Studio Max, Cinema 4D, Light wave, Softimage and Modo are mainly for commercial advertising or VFX movies as much as the device compositing, like After Effects is also aimed at this. On the other hand, Maya and Houdini are mainly for animation, VFX in film production, and compositing means such as Nuke and fusion are VFX films. Finally, the reasons for choosing specific financial software can. Maybe cheaper to buy software that has all the necessary characteristics, rather than update all other software that has the studio.
- 11. Modern industry of digital video with all its animated graphics, visual effects, 3D animation and real that has great benefits. However, some critics that modern technologies penetrate the flatness in the dialogue and the main story of the film, because they are filled with special effects and CGI with the advent of computer graphics and various kinds of visual effects work actors in films declined slightly.

Therefore the researcher found that, the digital video industry in the near future, usually with the computer-generated imagery, most of the scenes in the studio with the latest technology, software and methods as green / blue screen VFX, 3D animation, morphing, motion tracking, and composition. No digital cinematography confusion continues to grow, because people are interested in films, commercials, animations and this is a very profitable form of entertainment. However, the digital nature of visual effects is so different from the visual effects that are already made; make it difficult to predict what the kind of computer graphics will be using in the future.

The Avengers film was selected in this study because it differs from other films in the following:

- 1. The new techniques applied in the movie as the one shots technique.
- 2. The combination of different effects, enabling the creation of new visual effects that are impossible to record with the conventional on-set approach.
- 3. The use of multiple visual effects such as 3D with missed camera while other movies are confined to one of them.
- 4. The selected well-known actors as superheroes such as Joss Whedon.

5.2 Recommendation:

The recommendations in this study are: benefit from further research by the continuation of the investigation, such as the apparent reality and increase their relationship with emotional arousal may interact with viewers delight in the experience.

It is also recommended that researchers to use mixtures of measures to realize the emotions or feelings of the apparent reality and specific level of manipulation on emotion technical regulation which may employ the participants.

The researcher hopes that other studies learn more about the cause of the behaviour enrich providing knowledge about the influence of media.

The researchers suggest that caution should be expressed on causal hypotheses account. The idea that is to increase of physiological activation contributes to the apparent reality perception and vice versa.

What is needed, systematic reflection on interdisciplinary links between the three areas of data processing, architecture, cinema and create an ontological framework animation digital architecture means in these contexts. This will benefit research examines the wealth of technical and narrative in the new environment. Also known as digital animation is a particular expression of the cinematic medium and as a subset of film practice, the lack of precision of the digital architecture of animated scientific discussion was in texts and publications the relationship and synergy between entertainment, architecture and cinema as the manifesto for checking the settings.

Technical camera has space could profoundly factors; they are not only from the point of view of the machine. Their decisions may depend on other factors, such as perception and narrative style director. New studies on cinema associated with visual effect. With these ideas in mind, the present study aimed to investigate the impact of this apparent lack of realism in the psychological experience of watching movies and emotions and related behaviours.

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