

# Cinematic Evolution: What Can History Tell Us About the Future?

Daniel Maddock  
Griffith Film School  
Griffith University, Brisbane  
[d.maddock@griffith.edu.au](mailto:d.maddock@griffith.edu.au)

## Abstract

Many commentators and proponents of the film industry have called for a review of the cinematographic award asking who is responsible for these images; the cinematographer or the visual effects artists. Theorist Jean Baudrillard said cinema plagiarises itself, remakes its classics, retro-activates its own myths. So, what can the history of filmmaking tell us about the practice of visual effects?

Four of the previous five winners for Best Cinematography in a Feature Film at the Academy of Motion Picture Arts and Sciences Awards (2009-2013) have been films which have contained a large component of computer generated imagery (animation and/or visual effects). Some of these films have moved far beyond creating virtual backgrounds for the actors to appear in. *Avatar*, *Life of Pi* and *Gravity* are examples of films creating whole universes and characters for the actor to interact with.

This paper analyses the use of visual effects in popular filmmaking prior to the use of computer technology for the art. This historical analysis is then compared and contrasted against today's discussion/argument of cinematographic authorship. What did it consist of before the use of computers in filmmaking? Are and will cinematographers always be the authors of the image?

### Keywords

*Virtual Cinematography, Cinematography, Visual Effects, Cinematographic Authorship*

## Introduction

Technological developments have been part and parcel of the ever changing face of film-making in Hollywood since the inception of cinema. From the inventions of sound recording to colour photography technological developments have had a lasting effect on the way cinema is made. Although the cinematographer has largely been on the forefront of such developments their role has generally remained consistent over the history of cinema. I will talk about my investigation into the current definition of cinematography which historically relies on the camera as central to the art and practice of cinematography.

This research questions the current definition as an accurate representation of current industry practice based on an historical analysis of the artistic practice of key cinematographers. I will explore the development of cinematographic

mediums and draw on recent examples of current practice in mainstream Hollywood cinema to suggest how the definition of cinematography might be reframed.

## Virtual Image Creation: the Cinematographic Argument

James Cameron's ground breaking film *Avatar* was released to record audiences in December 2009. It was a film much discussed by critics and the wider media while it broke box-office records becoming the highest grossing film in history at the time and the first film to gross more than two billion dollars [1][2][3].

The famous film critic Roger Ebert of the Chicago Sun-Times called the film extraordinary and gave it four stars out of four. "Watching *Avatar*, I felt sort of the same as when I saw *Star Wars* in 1977", he said, adding that like *Star Wars* and *The Lord of the Rings*, the film employs a new generation of special effects and it is not simply a sensational entertainment, It is a technical breakthrough which has an environmental and anti-war message [4].

*Avatar* won the 82<sup>nd</sup> Academy Awards for Best Art Direction, Best Cinematography and Best Visual Effects, and was nominated for a total of nine Oscars, including Best Picture and Best Director [2].

However, *Avatar*'s cinematographer Mauro Fiore, ASC, didn't step foot on the film's set until Cameron had already been shooting the virtual elements for eighty-five days [5]. Fiore won the Best Cinematography award for a film which he says is about seventy percent virtual; though he believes his work on the live-action component to be the imagery that set the look of the film [5].

The argument itself blew-up in 2012 shortly after *Life Of Pi*, another huge grossing and largely CGI film, was released. Not only where some critics, one hesitates to call them purists, still concerned with the input of the cinematographer to the overall image but one famous and outspoken cinematographer was furious about *Life Of Pi*'s Best Cinematography Oscar for Cinematographer Claudio Miranda, ASC:

I don't care, I'm sure he's a wonderful guy and I'm sure he cares so much, but since ninety-seven percent of the film is not under his control, what the fuck are you talking about cinematography, sorry. I'm sorry. I have to be blunt and I don't care, you can write it. I think it's a fucking insult to cinematography [6]

That was a statement from Australian Cinematographer Christopher Doyle, HKSC, now an expat living in Hong-Kong. Furthermore most cinematography associations don't yet recognise virtual imagery; although the Australian Cinematography Society is one of the first and few to have awards and recognition for virtual work [7].

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission. Copyright 2015 AUC Createworld.

Many journalists and commentators have discussed the possibility for a return to two awards for Best Cinematography at the Oscars as it was in the early days of colour photography when there was one award for black and white and one for colour photography [8][9]. We seem to be at a stage where there is a strong realisation in the industry of the effect of virtual cinematography in filmmaking but an uncertainty of what to do with this virtual image and where it may fit in to our industry structure.

## Visual Effects History

An argument could be made that the first films to use visual effects were those made in the very beginning of cinema. Georges Melies is probably the most notable early filmmaker to use visual effects extensively. Most of Melies effects involved the use of dissolves to make people and objects disappear and re-appear and double exposures used as a form of crude luminance key to create floating, bodiless faces. Essentially Melies used stage magic tricks that he refined for cinema [10][11].

However the birth of the visual-effects artist in cinema came in 1927 with Director Fritz Lang's epic masterpiece *Metropolis*. This film was like nothing else that had been seen before and continues to be a classic of cinema to this day [11]. The filming of miniatures had been done before but the work of Cinematographers Karl Freund and Gunther Rittau was particularly fine on this film. Eugen Schufftan, later to become an Oscar Award winning cinematographer, was credited with 'Special Visual Effects.'

On *Metropolis* Eugen Schufftan refined a process for compositing impossible shots together which would later be called the Schufftan Process [11]. Schufftan was able to composite actors into a miniature set through the use of partial mirrors making impossible and fantastic scenes for an awed audience. Through this partial mirror, which was positioned at forty-five degrees to the lens, both elements when placed in the correct position and distance from the lens would appear as one.

Eugen Schufftan's role on *Metropolis* was solely to produce these images therefore Schufftan can be referred to as the first visual-effects cinematographer. His process carried on until the middle of the century when it was replaced by static and travelling mattes [11][10].

Analysing Eugen Schufftan's career following this film it appears that due to his subsequent and notable success as a cinematographer (he won the Oscar for Best Cinematography in 1961 for the American film *The Hustler*) over a forty year career making films throughout Europe and America, he is and was then a cinematic image maker on the frontier of the art and practice [12].

Schufftan can be thought of as a cinematographer in his own right for the scenes he was responsible for on the film *Metropolis*. At this time in the history of cinema it was normal for the cinematographer/s to be responsible for any visual effect. Not least because there was no other way to make a visual effect in cinema except with a camera but also because any time a camera was used the resultant image was the responsibility of the cinematographer [13].

Unfortunately not a great deal is known about the exact practice and role of those responsible for the visual effects cinematography at this time because studios went to extraordinary lengths to maintain a veil of secrecy around the

actual making of their films so as not to demystify the magic [13].

## Visual Effects The Turning Point: 1993-2009

In the decades to follow the last uses of the Schufftan Process and the introduction and popularisation of other processes and technologies for visual effects cinematographers were pushed further away from the creation of such imagery. Processes such as stop motion and matte-painting still involved photography but were slowly becoming independent components of production with which the cinematographer had little contact.

The big shift away from cinematographic involvement came with the first large-scale use of computer generated imagery in a popular Hollywood feature film [14]. The creation of dinosaurs for the now classic *Jurassic Park* embodied this huge shift to a new era of Hollywood filmmaking. For the first time physical visual effects were replaced with virtual creations; creations that the cinematographer did not see on-set during production. Computers were not part of the production process for a cinematographer at that time and were seen as more of a post-production tool, a tool that had nothing to do with the camera which is a key element in the definition of cinematography.

Though this was groundbreaking at the time it was still far away from the authorship discussion of today. There is about fifteen minutes of dinosaur shots in *Jurassic Park*, nine of those minutes use practical, physical dinosaurs in the form of puppets or animatronics while only six minutes in total are CGI dinosaurs [14]. This process and technology replaced a component of puppetry and stop-motion animation but did not alter the cinematography of the film. This type of visual effect was a post-production addition to the film. The film would be shot with the knowledge, based on story-boards, that a dinosaur would be put in frame in post-production [14].

This may have an effect on composition and lighting but not radically change the overall look. The workflow in this era started with an almost entirely finished image to which the CGI team would insert a subject or object. This subject or object would not usually comprise a large component of the frame. The subject or object would also have to be 'matched' to the image which has been recorded by the cinematographer and therefore retain the cinematographer's original look. Today's discussions of authorship began to appear when the next great leap forward in popular cinema occurred; the creation of entire virtual scenes within a live-action film.

## Virtual Cinematography: 2009–2014

As I discussed earlier in this paper *Avatar* was a huge turning point in filmmaking, cinematography and virtual visual effects due to its approach of entirely virtual scenes as opposed to *Jurassic Park*'s insertion of virtual elements, subjects and objects. In fact, prior to 2008 there had not even been a winner for best cinematography that wasn't shot on celluloid emulsion film; an analogue medium [15]. 2008's winner *Slumdog Millionaire* shot by Anthony Dod Mantle, DFF, BSC, ASC was the first winner to be shot using a digital camera.

When *Avatar* won in 2009 with a film that was seventy percent virtually created images discussions of authorship arose [6]. Richard Crudo, ASC, President of the American Society of Cinematographers writes in American Cinematographer Magazine of June 2014:

If the history of cinematography has proven anything, it's not only that our world is one of steady change, but also that we are adaptable artists who are always embracing the new. Over the past year or two, certain self-interested individuals have been trying to redefine our job title and description to cover the myriad aspects of the hybrid model. That's just nonsense. Everything it entails has fallen under our exclusive purview as authors of the image since the very beginning, and that will continue to be true no matter where the technology takes us [16]

As almost all definitions for cinematography include a camera as central to the art and practice this automatically rules out virtual imagery or CGI as something the cinematographer is responsible for. Though author and cinematographer Blain Brown may disagree:

cinematography is more than the mere act of photography. It is the process of taking ideas, words, actions, emotional subtext, tone, and all other forms of nonverbal communication and rendering them in visual terms [17]

If this definition can be used then the work of cinematographer Emmanuel Lubezki, AMC, ASC on the film *Gravity* could be a model for filmmaking process and an example of the authorship of virtual imagery. Lubezki, a Best Cinematography Oscar Winner for *Gravity* in 2013, redesigned the entire process of traditional filmmaking procedure by starting with the virtual computer generated imagery and then lighting the live-action to suit:

Lubezki was deeply involved in every stage of crafting the real and computer-generated images. In addition to conceiving virtual camera moves with Cuaron, he created virtual lighting with digital technicians, lit and shot live action that matched the CG footage and fine-tuned the final rendered image [18]

As with Schufftan an analysis of Lubezki's career and films can show his deep involvement in *Gravity's* images; a film which is almost entirely virtual. Lubezki's aesthetic is prevalent in all his films but especially those where he has collaborated with Alfonso Cuaron, the Director for *Gravity*, and Terrence Malik, the Director of *To The Wonder*.

One such example concerning Lubezki's approach comes through the element of lighting. *Gravity* was shot entirely in a studio environment and pre-lit in a computer using rehearsed and pre-programmed LED lighting designs that were run by software. *To The Wonder* was shot entirely on location using minimal to no film-lighting fixtures and instead relying almost entirely on natural light. However, Lubezki sees both of these films as having the same 'nuanced' approach to lighting. To explain I will read two short excerpts from articles about the films in American Cinematographer Magazine. The first is about the Terrence Malik film *To The Wonder*:

On Tree of Life we really tried to do combinations of scenes with light and scenes without, and when you add movie lights they don't have the complexity of natural light. You're putting one light that has one tone and one color through some diffusion, and it doesn't have the complexity of natural light coming in through the window from a blue sky and clouds bouncing green off the grass. Some would call that kind of light imperfect, but it's more accurate to call it more complex. That complexity of natural light and the way it hits the face is amazing, and when you start to go that way it's

hard to go back and light [things artificially]. The less you use artificial light, the more you want to avoid it, because the scenes feel weak or weird or fake [18].

And now this quote about Alfonso Cuaron's *Gravity*:

Inside the LED Box, the CG environment played across the walls and ceiling, simulating the bounce light from Earth on the faces of Clooney or Bullock, and providing the actors with visual references as they pretended to float through space. This elegant solution enabled the real faces to be lit by the very environments into which they would be inserted, ensuring a match between the real and virtual elements in the frame. For Lubezki, the complexity of the lighting from the Earth source was also essential, giving nuanced realism to the light on the faces. "When you put a gel on a 20K or an HMI, you're working with one tone, one color. Because the LEDs were showing our animation, we were projecting light onto the actors' faces that could have darkness on one side, light on another, a hot spot in the middle and different colors. It was always complex, and that was the reason to have the Box [18].

## The Future: A Wider Conceptual Approach

With films like *Gravity* and cinematographers like Emmanuel Lubezki creating new ways for cinematographers to author images and own them throughout the production a new approach may be needed in film schools to tackle the future. Cinematographer Roger Deakins BSC, ASC has been engaged on many animations and credited as an image consultant. These animations, *Wall-E*, *Rango* and *How To Train Your Dragon*, have created striking images for cinema [19] [20][21]. I believe it's only a matter of time before cinematographers are expanding their craft into similar narrative imagery such as video games [22][8].

There is only one school worldwide that I can find offering virtual cinematography courses. The Global Cinematography Institute was founded by two famous names of Hollywood cinematography, Vilmos Zsigmond, ASC and Yuri Newman, ASC [23]. Their mission statement is:

The Global Cinematography Institute (GCI) is devoted to the education of cinematographers and filmmakers as the industry continues to extend into the digital and virtual realms. Along with teaching students concepts and techniques in "Traditional Cinematography", GCI also provides a foundation in subjects such as "Virtual Cinematography", "Previsualization", "Digital Lighting", "Image Management" and more. The goal of the Institute is to take students to the next level and put them in position for meaningful careers in cinematography, present and future.

The Global Cinematography Institute has seen the future in filmmaking and stands to put cinematographers in the driving seat. Cinematographers are not merely camera operators who record an image but artists who take ideas, words, actions, emotional subtext, tone, and all other forms of nonverbal communication and render them in visual terms. This can be applied to our work in the future.

## References

1. 'Avatar', viewed 14 September 2014, <http://boxofficemojo.com/movies/?id=avatar.htm>
2. 'Avatar', viewed 14 September 2014, [http://en.wikipedia.org/wiki/Avatar\\_\(2009\\_film\)](http://en.wikipedia.org/wiki/Avatar_(2009_film))

3. Bettinger, Brendan 2010, 'AVATAR Achieves The Highest Worldwide Gross of All Time with \$1.84 Billion', viewed 14 September 2014, <http://collider.com/avatar-achieves-the-highest-worldwide-gross-of-all-time-with-184-billion/>
4. Ebert, Roger 2009, 'Avatar', viewed 14 September 2014, <http://www.rogerebert.com/reviews/avatar-2009>
5. Hoben, Jay. 'Conquering New Worlds', *American Cinematographer*, vol. 91, no. 1, pp. 32-47. 2010.
6. Gaskin, Sam 2013, 'Christopher Doyle Interview Part 2: "Life of Pi" Oscar is an Insult to Cinematography', *Blouin Art Info*, viewed 28 May 2013, <http://sea.blouinartinfo.com/news/story/874483/christopher-doyle-interview-part-2-life-of-pi-oscar-is-an>
7. Australian Cinematographers Society 2013, *Australian Cinematographers Society*, North Sydney, New South Wales, viewed 28 May 2013, <http://www.cinematographer.org.au>
8. Hardy, Robert 2014, 'Should The Oscar For Cinematography Be Split Into Two Different Categories', *No Film School*, viewed 17 March 2014, <http://nofilmschool.com/2014/03/petition-split-academy-award-best-cinematography-live-action-cgi-based/>
9. Stuart, Jamie 2013, 'Hey, Academy: Here's Why the Best Cinematography Oscar Should Be Divided Into Two Awards', *Indie Wire*, viewed 17 March 2014, <http://www.indiewire.com/article/hey-academy-heres-why-the-best-cinematography-oscar-should-be-divided-into-two-awards?page=1#articleHeaderPanel>
10. 2011, 'The History of Specials Effects - Part One', *YouTube*, viewed 15 September 2014. <http://www.youtube.com/watch?v=DGfSz8d-Z6I>
11. IMAGO, *The Federation of European Cinematographers. Making Pictures: A Century of European Cinematography*. Harry N. Abrams, Incorporated, New York, United States of America, 2003.
12. Williams, Tomas. 'Tricks of the Light: A Study of the Cinematographic Style of the Émigré Cinematographer Eugen Schüfftan,' *Doctor of Philosophy Thesis*, University of Exeter. 2011.
13. 2014, 'Matte Shot - A Tribute to Golden Era Special FX', viewed 10 March 2014. <http://nzpetesmatteshot.blogspot.com.au>
14. Renee, V 2014, 'How the CGI Dinosaurs of 'Jurassic Park' Changed the Cinematic World', *No Film School*, viewed 13 June 2014, <http://nofilmschool.com/2014/06/cgi-dinosaurs-jurassic-park-changed-cinematic-world>
15. 'Academy Award for Best Cinematography', viewed March 2014, [http://en.wikipedia.org/wiki/Academy\\_Award\\_for\\_Best\\_Cinematography](http://en.wikipedia.org/wiki/Academy_Award_for_Best_Cinematography)
16. Crudo, Richard. 'President's Desk', *American Cinematographer*, vol. 95, no. 6, pp. 12. 2014
17. Brown, Blain. *Cinematography: 2nd ed. Theory and Practice*. Focal Press, Waltham, Massachusetts, 2012
18. Bergery, Benjamin. 'Facing The Void', *American Cinematographer*, vol. 94, no. 11, pp. 36-49. 2013
19. Chen, David 2011, 'Interview: Legendary Cinematographer Roger Deakins', *Film: Blogging The Reel World*, viewed 16 August 2013, <http://www.slashfilm.com/roger-deakins-interview>
20. Goldman, Michael 2011, 'More About Deakins' Doings', *The Art of the Craft Blog*, weblog post, viewed 28 May 2013
21. Ludwig, Joe 2011, 'The Imperfect Lens - Creating the Look of WALL•E (WALL•E Special Features)', viewed 18 March 2014
22. 2013, 'Beyond: Two Souls Director David Cage On Cinematography', *Tribeca - Tech*, viewed 12 April 2014, <http://tribecafilm.com/stories/beyond-two-souls-david-cage-interview-ellen-page-willem-dafoc-film>
23. *Global Cinematography Institute*, viewed January 2014, <http://globalcinematography.com/index.htm>