



# The Birth of a Notation: Myths and Histories of Digital Cinema

Enrico Terrone

Publié le 10-03-2020



Creative Commons Attribution-ShareAlike 4.0 International (CC BY-SA 4.0)

## Abstract

Does the digital turn introduce a total discontinuity in the history of cinema? André Gaudreault and Philip Marion (2015) claim that it does and provide an argument in favour of such “total discontinuity” view. In this paper, I shall reject their argument by debunking one of its premises. I shall then consider an alternative perspective, the “continuity view” proposed by philosophers such as Berys Gaut (2010) and David Davies (2011), who argue that the digital turn does not break the history of cinema. Finally, I shall find middle ground between the continuity view and the total discontinuity view, arguing that although the digital turn does not involve a total discontinuity in the way films are made by filmmakers and seen by spectators, it significantly changes the way films travel, as it were, from filmmakers to spectators.

## Résumé

Est-ce que le numérique introduit une discontinuité totale dans l’histoire du cinéma? André Gaudreault et Philippe Marion (2015) affirment que c’est le cas et fournissent un argument en faveur de la « discontinuité totale ». Dans cet article, je rejeterai leur argument en démystifiant l’une de ses prémisses. J’examinerai ensuite une autre perspective, la « continuité », proposée par des philosophes tels que Berys Gaut (2010) et David Davies (2011), qui soutiennent que le numérique ne bouleverse pas l’histoire du cinéma. Enfin, je proposerai une médiation entre la continuité et la discontinuité totale : bien que le virage numérique n’entraîne pas une discontinuité totale dans la manière dont les films sont réalisés par les cinéastes et vus par les spectateurs, il modifie considérablement la façon dont les films voyagent, en quelque sorte, des cinéastes aux spectateurs.

**Keywords:** special effects, film history, code, notation, analogue technologies, digital technologies

**Mot-clés :** effets spéciaux, histoire du film, code, notation, technologies analogiques, technologies numériques

# The Birth of a Notation: Myths and Histories of Digital Cinema

Enrico Terrone

## Introduction

This paper discusses the claim that the digital turn introduces a total discontinuity in the history of cinema. Such a discontinuity can be characterized in melancholic terms, as in Jacques Aumont's (2012) and David Rodovich's (2007), or rather in a more hopeful way, as in the works of André Gaudreault and Philippe Marion (2015) and Lev Manovich (2001). I shall focus on Gaudreault and Marion's view, which clearly articulates the structure of what I take to be the main argument in favour of total discontinuity. In the first and second parts, I shall reject this argument by criticizing one of its premises. In the third part I shall consider an alternative perspective, the "continuity view" proposed by philosophers such as Berys Gaut (2010) and David Davies (2011), who argue that the digital turn does not break the history of cinema. In part four and five, I shall find middle ground between these two more radical positions - the continuity view and the total discontinuity view, arguing that although the digital turn does not involve a total discontinuity in the history of cinema, it significantly changes cinema in a particular way; via a dialectical argumentation style, I will thus propose a synthesis outlining a sharp discontinuity introduced by digital cinema that nonetheless denies such discontinuity concerns the way in which films are created by filmmakers and appreciated by spectators. Ultimately, the discontinuity introduced by digital cinema only relates to the way in which films travel, as it were, from filmmakers to spectators.

## 1. Total Discontinuity

According to Don McLean's song *American Pie* and George Lucas' film *American Graffiti*, music can, since Buddy Holly's passing, no longer be considered music. Likewise, according to Gaudreault and Marion's book *The End of Cinema? A Medium in Crisis in the Digital Age* (2015), cinema, ever since the digital turn, is no longer cinema. What is said in *American Graffiti* and *American Pie*, however, is no more than a hyperbolic remark which rhetorically emphasizes Buddy Holly's artistic greatness. Neither McLean nor Lucas seem to really believe that since Buddy Holly's death music has turned into another form of expression. Instead, Gaudreault and Marion take very seriously the thesis that the digital turn literally turned cinema into something else. In fact, they conceive of the digital turn as a total rupture with the history of cinema; nothing will be as it was before. In this sense, Gaudreault and Marion reveal a significant affinity with scholars such as Aumont and Rodowick. And yet, the two scholars emphasize the "dark side" of the digital turn while Gaudreault and Marion, just as Manovich, are more keen to see the bright side of the novelty offered by this break with the past.

Gaudreault and Marion's argument in favour of total discontinuity has an underlying structure that one can articulate in two premises and a conclusion. Premise (1) states that a digital film is not a material trace but a series of numbers, a code. Premise (2) adds that codes are manipulable at will:

by its very nature encoding makes every kind of manipulation possible (2015, 54).

These premises lead us to the conclusion (3) that digital cinema sharply differs from analogue cinema because, as a code, it can be altered. As Gaudreault and Marion write:

Digital technology makes possible almost complete control over the image, facilitating creative work in unprecedented fashion (2015, 54).

Gaudreault and Marion's argument is valid, and premise (1) is true. Premise (2), as I will argue, is in fact false, and therefore the conclusion (3) does not follow.

I argue that premise (2) is false because a code involves absolute manipulation only in theory, not in practice. Yet, cinema is, by nature, a cultural practice, that is, a sort of social game governed by norms and patterns of behaviour that usually remain implicit in a network of shared attitudes such as beliefs, intentions and expectations. An important task of film aesthetics consists in trying to make such norms and patterns of behaviour as explicit as possible.

From this perspective, films are governed by public norms, and thus can be traced back to the category of public artifacts, which Amie Thomasson (2014) characterizes as essentially social and normative:

While all artifacts are indeed mind dependent, public artifacts do not depend merely on the *individual* intentions of their makers; they also depend on public norms. (2014, 47)

The public norms that govern the use of paradigmatic technical artifacts are quite often made explicit by user manuals, whereas those that govern the use of films remain implicit in networks of shared attitudes. Film aesthetics is therefore needed in order to make them explicit. In particular, film aesthetics is now required to explain whether and how such norms change after the digital turn. From this perspective, we should ask what the digital code enables in practice, regardless of what that code enables in principle.

Consider, for instance, a digital film in 4K. Every twenty-four times per second there is a frame consisting of about nine million coloured dots, called pixels. In one second of this film there are about two hundred million pixels, together with at least a hundred thousand sound samples. In a minute, twelve billion pixels. In an hour, more than seven hundred billion pixels. A man's entire life would not be enough to individually manipulate the value of all these coloured points. In this sense, the digital code allows us to manipulate a film only in a purely hypothetical way. In practice, making a film always requires relying on some automatism, which may be the new automatism made available by computer algorithms or the dear old photographic automatism.

Filmmakers do not create their films by manipulating pixels, nor do spectators usually appreciate a film by thinking that it was made in such a way. In this sense, the total discontinuity between the films produced in the digital era and those produced earlier boils down to myth. Digital films cannot be manipulated at will. The digital turn makes manipulation much easier than

before, but one should not forget that significant manipulations were possible before the digital era. In fact, it has been possible ever since Méliès invented special effects.

## 2. Special Effects and Editing

At this point, one might object that, although analogue cinema made room for manipulation, it also put constraints on it, whereas digital cinema allows unlimited manipulation. Yet, I argue that digital cinema also puts constraints on manipulation. Given the temporal limits of human existence, a completely manipulated film remains an impossible task even in the digital era. The digital turn raises the bar of manipulation, whereas total manipulation remains out of reach.

Furthermore, the coming of digital technology does not seem to produce particularly significant changes in the work of many filmmakers. One might wonder, for instance, whether the films of directors such as Roman Polanski, Martin Scorsese or Claire Denis have changed significantly due to the transition from analogue to digital. It seems to me that only a few cinephiles would be able to say with certainty which is François Ozon's latest analogue film and which is his first digital film. From the perspective of an ordinary spectator, cinema remains more or less the same before and after the digital turn. Of course, this is a hypothesis requiring empirical verification through surveys and statistics, a study which is beyond the scope of this paper. Suffice to say that any, if not most, films produced after the digital turn are not immediately and sharply distinguishable from those produced before this turn. The situation is different if one focuses on genres such as science fiction and fantasy, or on animation films. Yet, in these cases, the digital turn largely relates to technical improvement of the film's creation, rendering the production of animations and special effects easier than before. There are no new kinds of phenomenal properties to be experienced (i.e. properties directly accessible to experience, as in visual or auditory properties for example), as occurred in the transition from silent to sound cinema, or from black and white to colour, or from the Academy format to the widescreen. Indeed, digital technologies allow one to realize in a simpler and more effective way the manipulations, additions or substitutions of the photographic data that in the century of Méliès, Harryhausen, Trumbull and Rambaldi

were obtained through mechanical and optical techniques. Yet, this does not entail that cinema as a whole becomes special effects or animation. As a cultural practice, film continues to effortlessly distinguish Pixar animation from Michael Moore's documentaries, just as spectators in the analogue age easily distinguished between Disney's cartoon and Robert Flaherty's documentaries. Of course, there are more complex cases, for instance films such as *Beowulf* or *Avatar*, but these remain borderline cases, just as *Mary Poppins* or *Who Framed Roger Rabbit* were in the analogue age. This is not enough to support Gaudreault and Marion's claim that:

Special effects, in fact, are no longer an optional supplement or inherent to certain genres, but rather a practice inseparably linked to the elaboration of film images tout court (2015, 56).

There remains a significant difference between *digital* special effects that patently introduce new entities in a scene depicted and merely auxiliary *digital* manipulation of the scene depicted, just as there was a significant difference between *analogue* special effects that patently introduce new entities in a scene depicted and merely auxiliary *analogue* manipulation of the scene depicted, for instance the use of rear projection in a film like *Notorious*.

Another important consequence that Gaudreault and Marion infer from the central role of the code in digital cinema relates to editing:

The data that are immediately encoded and thereby dematerialized thus lend themselves, at the very source, to every possible arrangement and rearrangement, a sign of the intrinsic plasticity of the digital image. In a sense, our traditional conception of editing is modified as a result (2015, 55).

From this perspective, editing is no longer an operation made *on* motion pictures; it becomes the essential element in the genesis *of* them. Gaudreault and Marion state that:

a kind of editing we might call intrinsic is inherent in the production of any digital image: even when it has not been retouched, it is always-already a 'translation' through encoding and the result of an editing process. (2015, 55)

In short, editing "merges with the very genesis of the images" (2015, 55). Yet, once again, this statement presupposes that what matters is what digital

technologies enable in principle. In considering digital cinema as an actual practice, it is clear that editing is not the source of images, but operates *on* them. In fact, in watching digital film, one is perfectly capable of identifying editing cuts to the same extent as when watching analogue film; one does not have the impression of watching just one long take nor that the editing is confused with the genesis of the images. Just as the digital turn does not involve animation and special effects are everywhere in a film, it does neither involves pervasive editing throughout the film.

### 3. The Continuity View

In his book *A Philosophy of Cinematic Art* (2010), Gaut supplements each chapter with an appendix that shows how the digital turn adds to relevant aspects of cinema with new and interesting features without essentially altering cinema. In particular, Gaut argues that the interplay between the *causal relationship*, characterizing the photographic accuracy of films, and the *intentional relationship*, enabling their manipulation, is crucial to both analogue and digital cinema. The only thing that changes is the way in which these two components are combined.

According to the "continuity view", the digital turn is to be understood as a new equilibrium between causal and intentional relationships, rather than as a total primacy of the latter over the former. Both in analogue cinema and digital cinema, Gaut points out that:

the essential presence of a causal relation between a photograph and its subject is consistent with the contingent presence of many intentional relations, capable of expressing thoughts. (2010, 45).

Thus, "the root feature of photography, that it is the mechanical recording of the appearance of things by fixing a record of the light emanating from them, applies in both cases." (2010, 48)

In his paper "Digital Technology, Indexicality and Cinema" (2011), Davies takes the continuity view one step further. He argues that even if, for argument's sake, we concede that the digital turn indicates the primacy of the intentional relationship over the causal one, we are still unable to conclude that this leads to total discontinuity in the history of cinema. In order to make this point, Davies points out that the core component of cinema as



an art form is fiction through depiction, the production of visual narratives concerning events occurring in a fictional world. Relying on Gregory Currie's (1995) account of film spectatorship, Davies argues that moving images are just a means of leading the audience to imagine what is going on in the fictional world. Therefore, even if moving images transform entirely after the digital turn, this does not change the core component of cinema as an art form, which remains using moving images to elicit imaginings regardless of whether such images are produced by means of causal relations or intentional relations. In other words, the digital turn does not prioritize the intentional relationship over the causal; this priority predates the digital era, as it exists in analogue cinema wherein photographic causality was simply a way of fulfilling the filmmaker's intention that spectators use moving images to imagine the fictional world that she has conceived.

#### **4. Three Ways of Being a Film**

Even if one agrees with Gaut's claim that the ontological novelty of the digital turn does not consist in absolute manipulation, as well as with Davies' claim that the digital turn does not affect the core activity of filmmakers and the core experience of spectators, there remains a relevant sense in which the digital turn introduces a sharp discontinuity in the history of cinema. The idea is that the digital turn substantially changes the "transmission belt" between the activity of filmmakers and the experience of spectators, that is, the preservation of the film.

After the digital turn, the possibility of seeing the same film under different circumstances no longer depends on material objects such as film strips and reels but on a code, or a notation. That is, it relies on a system of symbols representing values of colours and sounds. As pointed out by John Zeimbekis (2012), the digital code, unlike analogue film, warrants exactly the same visual and sound patterns shown at each new screening. Moreover, the code is not affected by material deterioration as time passes in the same way as material objects. Therefore, a film becomes something that a filmmaker can establish once and for all. Cataclysms aside, viewers of the future can continue to see digital films from the past exactly as filmmakers had conceived them.

In order to elucidate this point, let me introduce some basic notions in film ontology, a discipline aiming to figure out which kind of things films are. As Noël Carroll (1996) suggests in his attempt to define the moving image, there are three ways of being a film: (a) the *work* created by the filmmaker; (b) the *template* that preserves the work; and (c) the *display* to which the spectators attend. Indeed, even in ordinary language the word "film" designates three distinct entities. First, it refers to the screening event, namely, the film as *display*: "The film will end at eleven pm". Second, to the object whereby this screening event is produced, namely, the film as *template*: "there are a lot of films in the warehouse". Third, the cultural entity that is embodied by objects and events of these sorts, namely, the film as *work*: "my favourite film is *Wild Strawberries*".

In the framework of cinema as a cultural practice, we appreciate and evaluate works by watching displays that are produced through templates. Specifically, a cinematic *work* requires *displays* and *templates* in order to preserve what a filmmaker created in her own context, and to transmit it to many other contexts.

The relevant manifest properties that make an event a display of a film are visual and acoustic properties. In general, instantiating a cinematic work amounts to producing a screening that shows certain patterns of colour and sound. Symmetrically, creating a cinematic work leads to specifying the distinctive visual and auditory properties that are to be exhibited by the work's screenings. The specification of these properties is made by the filmmaker not as an insulated being, but as a person that acts within a cultural practice, with which the filmmaker should negotiate in order to specify the relevant features of her work. For instance, Ingmar Bergman created *Wild Strawberries* as a cinematic *work* through an implicit negotiation with cinema as a cultural practice within which *templates* and *displays* could be produced.

On the one hand, cinema, as a cultural practice, establishes normative kinds of properties, that is, kinds of properties that an object ought to possess in order to properly be appreciated as a film. On the other hand, the filmmaker individuates a peculiar configuration of normative properties in the logical space of possibilities set up by the cinema as a practice.

In a certain period of the history of cinema, only visual properties, not acoustic ones, are normative within the cinematic work, whereas from a certain point in that history acoustic properties also become normative. Metaphori-

cally speaking, it is cinema as a cultural practice that establishes the chessboard on which filmmakers will make their moves. Of course, there can be experimental filmmakers who attempt to challenge the state of play, of cinema and its norms. Yet, in order to understand such approaches to the "game of cinema", we need to first understand how its "chessboard" is made; what underlying norms inform the creation of cinematic works?

First of all, a filmmaker should specify visual properties in such a way that these can be embodied by a template and instantiated by a display. Since displays consist of spatiotemporal coloured patterns, the specified visual properties must have a corresponding structure. In this sense, the filmmaker specifies an essentially spatiotemporal distribution of chromatic qualities, which I call the "visual manifold". There is a crucial difference between the spatiotemporal structure of the display and that of the manifold. The display is located in space and time, whereas the manifold is a normative structure that specifies how a display ought to be located in space and time.

## 5. A New Bridge between Two Old Banks

Digital technologies allow a filmmaker to specify the visual manifold in a notational way, so that every point of the manifold corresponds to a class of light values. Thus, a filmmaker can specify as normative, within her work  $W$ , all visual properties that  $W$  should have. In principle, there could not be two correct instances of  $W$  that are phenomenally distinguishable with respect to the spatiotemporal distribution of chromatic qualities. If a display is phenomenally different from what is specified by the filmmaker and fixed by the digital score, this cannot be a correct instance of  $W$ . It can be, at most, a flawed instance of  $W$ . As a thought experiment, we can even conceive of special digital devices (perhaps embedded in mobile phones) with which spectators can check whether the film they are watching is shown correctly. Such devices could measure light values on the screen and compare them with the original light values approved by the filmmaker and stored in some online database.

However, this is not the way in which cinema functions in practice, at least, not yet. The visual manifolds that filmmakers currently specify as normative within their works are not unique visual structures, but rather sheaves of visual structures with sufficiently small phenomenal differences between them.

Furthermore, in creating her work, a filmmaker usually does not explicitly specify a visual structure, which is rather implicitly established in practice by making reference to the original template approved by the filmmaker, or to the shared memories of the first public display, namely the *premiere*.

That being the case, in cinema we still do not exploit the ontological potential of digital technology (that is, their potential for specifying the identity conditions of films with absolute precision). Nevertheless, the ontological structure made explicit by this technology allows us to better understand what the cinematic work really is. Digital technology shows us that what is really normative within the cinematic work is ultimately not the template, but the visual structure that, by means of the template, can be shown as a display. That is why cinema as a cultural practice makes room for digital instances of old analogue films. What is normative in an analogue film, indeed, is not the film strip, but rather the visual structure preserved by the film strip.

In both analogue and digital cinema, film specifies of a visual manifold that can be instantiated by visual displays. What changes is only the ontological status of the template that relates the manifold to the display. In the analogue case we have concrete particulars, in the digital case an abstract code which does not occupy space and time in the same way as concrete particulars. That is to say that the analogue template is a *physical* object whereas the digital template is rather a sort of *mathematical* object. Yet, the ontological statuses of the cinematic work and of its instances remain the same both in analogue and digital cinema. The work is a visual manifold in both cases, and its instances are visual displays in both cases as well. In sum, there are three ways of being a film, namely, the *work*, the *template* and the *display*. The digital turn totally transforms the film as *template*, not the film as *work* nor as *display*. What the filmmaker creates remains a configuration of images and sounds, regardless of whether she creates it by relying on analogue technologies or digital technologies. Although the latter allows the filmmaker much greater degrees of freedom in configuring images and sounds, the film as a work remains an audiovisual configuration just as analogue film. Symmetrically, the spectator always perceives an instance of an audiovisual configuration, regardless of whether analogue or digital technologies are at work. However, at the level of the connection between work and screening, the digital turn actually introduces an ontological novelty: patterns of colours and sounds now travel through abstract objects, namely

numbers, instead of through concrete objects such as film strips and reels. The digital code, in this sense, is a new bridge between two old banks.

## Bibliographical References

- Aumont, Jacques. 2012. *Que Reste-T-Il Du Cinéma ?* Philosophie et Cinéma. Paris: Vrin.
- Carroll, Noël. 1996. *Theorizing the Moving Image*. Cambridge Studies in Film. Cambridge ; New York: Cambridge University Press.
- Currie, Gregory. 1995. *Image and Mind: Film, Philosophy and Cognitive Science*. Cambridge [England]: New York, NY: Cambridge University Press.
- Davies, David. 2011. "Digital Technology, Indexicality, and Cinema." *Rivista Di Estetica*, no. 46 (March): 45–60. <https://doi.org/10.4000/estetica.1655>.
- Gaudreault, André, Philippe Marion, and Tim Barnard. 2015. *The End of Cinema? A Medium in Crisis in the Digital Age*. Film and Culture. New York: Columbia University Press.
- Gaut, Berys Nigel. 2010. *A Philosophy of Cinematic Art*. Cambridge ; New York: Cambridge University Press.
- Manovich, Lev. 2001. *The Language of New Media*. Leonardo. Cambridge, Mass.: MIT Press.
- Rodowick, David Norman. 2007. *The Virtual Life of Film*. Cambridge, Mass: Harvard University Press.
- Thomasson, Amie. 2014. "Public Artifacts, Intentions, and Norms." In *Artefact Kinds*, 45–62. Springer International Publishing. [https://doi.org/10.1007/978-3-319-00801-1\\_4](https://doi.org/10.1007/978-3-319-00801-1_4).
- Zeimbekis, John. 2012. "Digital Pictures, Sampling, and Vagueness: The Ontology of Digital Pictures." *The Journal of Aesthetics and Art Criticism* 70 (1): 43–53. <https://doi.org/10.1111/j.1540-6245.2011.01497.x>.