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The borders of animation: designing in time and space

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[Animation / Animação]



Abstract

Animated films are usually associated with short and feature films based on characters, fiction or nonfiction, however animation is not restricted to traditional forms of cinema. According to Flusser [1], even though design and communication have been treated as separate fields, they aren't. Considering that animation has become intrinsic in diverse design processes: motion graphics, game design, and virtual reality - this premise can also be applied to animation and design. Given that animation is becoming omnipresent and an integral part of today's cybernetic and media driven society, animation becomes a form of human speech in this networked reality, either as an interface or as a representation that gives objects temporal form. The expansion of animation beyond cinematic form and language, leads us to investigate the role of animation in the age of digital cinema.

1. Introduction

The aim of this article is to establish a conceptual framework subsiding the discussion on definitions of "animation art" and how it dialogues with intersecting fields, particularly design. Since animation, specifically animated films, are quite commonly associated to the cinematic universe, I would assume that there is a consensus that animation as discipline is classified as sub-category within film studies and audiovisual production processes. However, not rarely misconceptions arise, the most common is the assumption that animation is a film genre [2]. By revisiting definitions of animation from the perspective of design disciplines, scientific visualization and digital culture, I question the validity of considering animation as a subset of film, alternatively, I propose that animation be studied as an art with a unique language and "grammar", mediated in multiple media and environments: film, digital communication, virtual reality, cybernetics, architecture and human computer interfaces.

If we accept that animation is not restricted to cinematic formats, therefore not exclusively a film art, but an art form in itself, we can realize that its language dialogues with other fields such as: data visualization, virtual modeling, pedagogical methods, design processes, digital devices and human computer interaction.

Keywords

Animation, motion graphics, graphic user interface design, human-robot interaction, transmedia.

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Virtual reality, augmented reality and digital based social networks constitute layers of an expanded universe establishing the fabric of the network culture we inhabit. Audiovisual communication today relies on media and design disciplines that incorporate animation as a universal language allowing for multi-cultural interactions in the digital universe. As the audience increasingly interacts with audiovisual media, spectators become agents - co-authors of a collective narrative. In this sense animation becomes a type of speech, in the same manner that Roland Barthes [3] describes myth as a type of speech.

2. Revisiting definitions of animation and cinema

By analyzing definitions presented by authors such as Bendazzi, Cholodenko, Furniss, Greenberg and Manovich, it is possible to establish a theoretical framework housing a range of thoughts on language, grammar and techniques of the animated arts. I propose reviewing these definitions as coordinates in a territory to be re-charted within a broader and more inclusive definition of the field. By questioning the definitions of animation, the borders of the animation field expand following socio-cultural and technological transformations in the audiovisual business that have occurred in recent years. Changes which seemed futuristic in the late 20th century are now an integral part of everyday life, animation was not spared by this shift and has become embedded into our digital lives, helping us use digital devices, access automated services and communicate with robots and artificial beings. In this sense animation becomes a “form of speech “ between humans and digital networks, acting as an interface allowing for time based interaction with digital devices.

Cholodenko [4], argues that since animation precedes the invention of motion picture films it should not be considered a sub-field of cinema studies, he believes that animation in its contemporary form, specially computer generated imagery has helped support the notion that film is a “type” of animation - due to digital technology, a century later we return to the invention of film, bringing animation back to a place that truthfully it has never left: the nucleus of contemporary cinema.

“If one may think of animation as a form of film, its neglect would be both extraordinary and predictable. It would be extraordinary insofar as a claim can be made that animation film not only preceded the advent of cinema but engendered it; that the development of all those nineteenth century technologies—optical toys, studies in persistence of vision, the projector, the celluloid strip, etc.—but for photography was to result in their combination/synthesizing in the animatic apparatus of Emile Reynaud’s *Théâtre Optique* of 1892; that, inverting the conventional wisdom, cinema might then be thought of as animation’s ‘step-child’.” (Cholodenko, 1997) [5]

According to Raz Greenberg [6] animation is not a medium, nor a technique, neither a code and not necessarily depends on the illusion of movement, citing the British science-fiction television series *Thunderbirds*

(1964 - 1966) that relied on the modification of the behavior of artificially created objects. Greenberg argues that for a long period of time theoretical discussions regarding animation have generally been part of the general theory of cinema, even though in reality cinema and animation are distinct fields. Furniss [7] suggests that the reason of the “inferior status” attributed to animation studies within academia is due in great part by the belief sustained by many researchers that animation is not a “real” art, given its commercial aspects and approximation to pop culture. Lev Manovich’s [8] definition of digital film contextualizes animation within the 21st century network culture, he states that cinema is a “child” that at one point in time expelled animation to its periphery, only to become (digital film) a particular case within the animation field:

“For the larger part of the twentieth century, different areas of commercial moving image culture maintained their distinct production methods and distinct aesthetics. Films and cartoons were produced completely differently and it was easy to tell their visual languages apart. Today the situation is different. Computerization of all areas of moving image production created a common pool of techniques, which can be used regardless of whether one is creating motion graphics for television, a narrative feature, an animated feature, or a music video.” (Manovich, 2006) [9]

Giannalberto Bendazzi [10] in his article “Defining Animation: A proposal” cites the first official definition of animation presented at the 1962 Annecy festival as the preamble of the original statute of the Association International du Film d’Animation (ASIFA).

“[While live action cinema] proceeds towards a mechanical analysis, through photography, of occurrences similar to those that shall be presented on the screen, animation cinema creates the occurrences using instruments different from those used for automatic registration. In animated films, the occurrences take place for the first time on the screen.” (ASIFA, 1962. In Bendazzi, 2004) [10]

The definition above can be correlated to Manovich’s [8] formulation that digital cinema ultimately is a cinematic form that no longer relies on image analysis, since it allows for the creation of synthetic imagery materialized exclusively on the screen, in opposition to the analog acquisition of images in live-action cinematography. Similarities do this concept can be found in ASIFA’s definition of animation, which acknowledges the singular fact that animated films come to life exclusively on the screen. A more lyrical, if not practical approach can be seen through eyes of Norman McLaren, according to Furniss [7], at the time he was the director of the National Film Board of Canada he stated:

“Animation is not the art of drawings that move but the art of movements that are drawn; What happens between each frame is much

more important than what exists on each frame; Animation is therefore the art of manipulating the invisible interstices that lie between the frames” Furniss (2014) [7]

In order to better grasp Lev Manovich’s [8] assumption that “Digital cinema is a particular case of animation which uses live action footage as one of its many elements.”, it is worthwhile revisiting definitions of film and cinema under the light of digital culture in order to further realize the impact of digital animation in cinema at large. If we were to rely strictly on dictionaries, we could define cinema as the art and the business of making films, it can also signify a movie theater. Film on the other hand, is related to a flexible, transparent medium capable of registering photographs that can be manipulated, cut, assembled, dubbed and layered. Animation historian Paul Ward [11] reminds us that in the beginning of the 20th century there wasn’t a clear distinction between animation and live action movies:

“However, it must be remembered that in the early cinema context the chronophotographic experiments of Muybridge were in very recent memory, and the notion of all “moving pictures” being “animated” was a common one. Indeed, in the period from 1895 to around 1907, and even later, the term “animated” often referred generically to all films that were shown, and terms such as “animated photography” were commonplace when referring to films in general, and not just those where some sort of frame-by-frame manipulation had taken place.” (Ward, 2000) [11]

Film as media had predefined formats and lengths dictated by the film business – in the the past decade we have seen this change in extreme ways: Technically, digital film no longer has to obey the rules of motion picture producers and distributors, as film acquisition, post-production and distribution have all gone digital, the movie theater or the cinema, becomes obsolete, or at least non-mandatory in order to experience cinema. Stan Brakhage, defends a *total cinema* experience, in *From Metaphor to Visions* (1963) [12] he says:

“As is, the “absolute realism” of the motion picture image is a contemporary mechanical myth. Consider this prodigy for its virtually untapped talents, viewpoints it possesses more readily recognizable as visually non-human yet within the realm of the humanly imaginable. I am speaking of its speed for receptivity which can slow the fastest motion for detailed study, or its ability to create a continuity for time compression, increasing the slowest motion to a comprehensibility. (Brakhage, 1963) [12]

Today, audiovisual delivery occupies the vast majority of data transmission on the internet. In 2018, Netflix was responsible for consuming 15% of the data on the global network, the streaming service exhibits. And it also pro-

duces live action and animated films, series, documentaries and TV shows on its service. The recent controversy at Cannes when Netflix opposed to projecting *Okja* (2017) and *The Meyerowitz Stories* (2017) at local movie theaters in 2017 [13] demonstrates the power of the digital service. Cannes retaliated the following year by rejecting Alfonso Cuarón's *Roma* (2018) in its competition. However, the fact that *Roma* is made for streaming does not exclude it from being cinema. If, by definition, cinema is the art and business of making movies, then Netflix is in the cinema business, independently of the theatrical distribution of its production. Youtube, Google's streaming service plays videos, some of them are films, produced as early as 1888, others are: TV shows, video-logs, *machinima*, remixes, music-videos. Some of this is Cinema, a lot may not be. Steven Soderbergh [14] during his keynote speech at the San Francisco International Film Festival in 2018, defined film and cinema in a networked culture:

"The simplest way that I can describe it is that a movie is something you see, and cinema is something that's made,... It has nothing to do with the captured medium, it doesn't have anything to do with where the screen is, if it's in your bedroom, your iPad, it doesn't even really have to be a movie. It could be a commercial, it could be something on YouTube. Cinema is a specificity of vision." (Soderbergh, 2018) [14]

So what is Cinema? Director David Lynch interviewed in the documentary *What is Cinema* [15], offers a poetic view on cinema: 'It's so beautiful (cinema), it's so delicate, if you can get in to that world, it's like a dream'. From this standpoint, cinema is a place, an experience, a dream, somewhere you go. Until recently moviemaking depended on film as a medium for registration and distribution. As a media, motion picture studios prioritized theatrical distribution, followed by cable TV, pay per view, video and DVD. The assumption that cinema depended on film as a medium was already being questioned by French film theorist André Bazin [16] in the 1960's when he considers Émile Reynaud's strips as a "sublime" form of cinema, and his animations precede the invention of film.

'As for the wonderful, the sublime E. Reynaud, who can deny that his animated drawings are the result of an unremitting pursuit of an *idée fixe*? Any account of the cinema that was drawn merely from the technical inventions that made it possible would be a poor one indeed. On the contrary, an approximate and complicated visualization of an idea invariably precedes the industrial discovery which alone can open the way to its practical use. Thus if it is evident to us today that the cinema even at its most elementary stage needed a transparent, flexible, and resistant base and a dry sensitive emulsion capable of receiving an image instantly-everything else being a matter of setting in order a mechanism far less complicated than an eighteenth-century clock-it is clear that all the definitive stages of the invention of the cinema had been reached before the requisite conditions had been fulfilled." (Bazin, p. 18, 1967)[16]

Bazin [16] argues that technical innovations introduced in order to make movies are banal in terms of scientific advancement, the driving force is the *idée fixe* of auteurs obsessed with telling stories, conveying ideas or portraying a singular view of reality. Film led to narrative form and formats, that required procedures. Eisenstein relied on *mise en scene* and *montage* in order to portray reality or a provide a view of such, while Bazin, believed that, if parts of reality are obscured by montage, then film cannot be truly realistic. Vertov's *Man with a Movie Camera* (1929) [17] is a clear example of how formal composition and non-narrative discourse can be realistic. In Alfredo Suppia's [18] analysis of intermediality in classic cinema theory, the researcher points out that avant garde artists when creating films explicitly combined visual arts, dance and literature arriving at cinema from a different perspective than dramatic narrative.

“Many of the avant-garde artists, adepts of the montage that Bazin opposed so energetically, discussed and made cinema with the help of music, dance, painting theater and literature, examples such as Fernand Léger's: *Ballet Mécanique* (1923-4) and *La Chute de La Maison Usher* (1928) are explicit combinations of artistic medium, not to mention Bazin's favorite opponent, Serguei Eisenstein, who arrived at cinema from a theater e whose theory of vertical montage is based on the vertical structure of polyphonic orchestration develops all lines of horizontal scores” (Suppia, 2015)[18] (Translation by the author.)

Christian Metz in ‘Film Language’ (1974 pp. 160-161) [19] was conscious of the limitations of applying the semiological analysis to cinema, when considering the difficulties he concludes, ‘Had the cinema not become thoroughly narrative, its grammar would undoubtedly be entirely different (and would perhaps not even exist)’. According to Metz, cinema is a socio-cultural fact, therefore it is impossible to define grammatical rules to its language. MTV's quick cutting and remixing: provided an anti-dialectical form of reshaping reality, procedures that at the frame level approximates film to animation. Experimental filmmakers and video-artists, from Fernand Léger *Ballet Mécanique* (1924) [20] to Matthew Barney's *Cremaster Cycle* (1994-2002)[21], have broken the rules of film montage and nevertheless are lesser cinematic experiences. Tom Gunning (1963) [22] summarizes the Cinema of Attractions as a spectacle, soliciting the audience attention by inciting curiosity to the uniqueness of the event.

“Writing in , flushed with the excitement of seeing Abel Gance's *La Roue*, Fernand Léger tried to define something of the radical possibilities of the cinema. The potential of the new art did not lie in “imitating the movements of nature” or in ‘the mistaken path’ of its resemblance to theater. Its unique power was a ‘matter of making images seen.’ It is precisely this harnessing of visibility, this act of showing and exhibition, which I feel cinema before displays most intensely. [Its] inspiration for the avant-garde of the early decades of this century needs to be re-explored.” (Gunning , p 381, 1963)[22]

Similarly to considering the Cinema of Attractions that marked early cinema in the first decade of the 20th century as a low art; contemporary audiovisual production such as video games, music videos, anime and cartoons, even though they use montage, *mise en scene* and narrative, they have not achieved the status of cinema as a high art.

3. Animating design

From 2014 to 2018 I conducted research exploring the borders of the animation and design fields. The results have been published in three articles: *Animation and Motion Graphics* [23], *Animation as a Transmedia Interface* [24] and more recently the application of animation in robotics: *Animation and Machines: designing expressive robot-human interactions* [25]. I will take the opportunity to revisit some examples encountered while researching the intersections between animation and design.

Motion graphics

The history of motion graphics precedes movies and can find its origins in 19th century visual music [26], or light displays, which have evolved side by side since the early days of animation. Graphic designer Louise Sandhaus [27] defines motion graphics as a contemporary term used to describe a broad field of design and production that encompasses film, video, and digital media type and imagery, including animation, visual effects, film titles, TV graphics, commercials, multimedia presentations, more recent architecture, and increasingly video games.

Motion design, more specifically animated typography has been present in film and television industry since its inception, from extradiegetic type found in the German expressionist film “The Cabinet of Dr Caligari” [28] to silent movie title cards and film title sequences. European avant-garde artists and filmmakers such as Dziga Vertov, Walter Ruttmann and Man Ray experimented with animated light, forms and sound in the early 20th century, followed by the post second world-war abstract and constructivist animators Norman McLaren, Oskar Fischinger, Len Lye and James Whitney. Demonstrating that the history of animation and motion graphics intersect since their beginnings.

Early station Id’s exhibited during television commercial breaks incorporated traditional animation techniques before adopting electronic graphics technology. Optical printing technology allowed for the creation by R/Greenberg & Associates of some of the most memorable title sequences for the big screen: the opening credits for *Superman* (1978)[29], *Alien* (1979)[30] and *The Untouchables* (1978)[31]. Television graphics pioneers we’re responsible for experimenting with novel techniques, such electronic effects and digital compositing popularized by MTV animated promos in the 1980’s. In Brazil the Austrian designer Hans Donner pioneered the use of computer generated imagery in television graphics by partnering with the California based company Pacific Data Images - PDI in 1982.

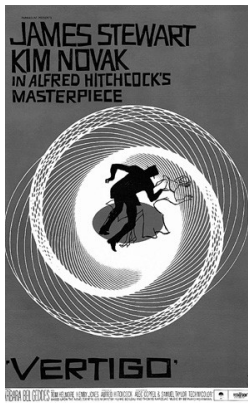


Fig. 1. Theatrical poster for the film *Vertigo*, designed by Saul Bass - 1957 (Paramount Pictures Corporation - Public Domain 1996)

One can not fully grasp the art of film titles without watching the work of Saul Bass, probably the most important pioneer of film title design, Bass has worked side by side with directors Alfred Hitchcock, John Frankenheimer and Martin Scorsese as a title designer and visual consultant, setting the visual tone and rhythm of film design and editing. Citing a couple of well known examples is probably the easiest ways to illustrate his contribution: The spiraling graphic in *Vertigo* (1958) [32] in probably the first feature to use computer graphics (created in collaboration with John Whitney) and in *Grand Prix* (1966) [33] he introduced the use of multi-image optical composition, breaking away from conventional time based montage.

One of the most important changes came with the introduction of cable television. Not only did Cable TV invest in the equipment and hired facilities to produce on - air promotions, it was also believed that they could compete with network TV by hiring artists and creative talent. MTV is a prime example of this strategy, opening up a whole new scenario for television, offering designers, animators, graffiti artists, video artists the opportunity to explore a new medium using animated visual effects.

Transmedia and Human Computer Interaction

The introduction of multifunctional smartphones with faster processors recently stimulated the development of interfaces that use animation in order to facilitate user interaction with digital devices. Because these devices access media space terminals, they can act as interfaces across multiple platforms: personal computers, game consoles, tablets, smartphones and public terminals. For example, digital interactive animations that simulate analogous action represent the act of placing a document in the trash or shooting a picture.

In any case, animation opportunities are used to create “gateways” of a transmedia universe. Animation here can be understood in a broader sense: creating synthetic realities, namely a synthesis of filmic environments, given it’s programmable and moldable nature, facilitating the interaction with virtual realities. Through the use of movement and animation techniques it is possible communicate and generate navigable visual environments serving as a navigation interface of transmedia properties. Since the introduction of Macintosh OS and the Windows environment, animation has been present



Fig. 2. The Matrix Digital Rain - Screenshot - © 1999-2003 by Jamie Zawinski (An animated representation of the Matrix Code bridges the series transmedia universe)

in Graphical User Interfaces (GUIs) allowing for the interaction of humans with applications and operating systems.

The plurality of computers that exist in our environment has created an “exoskeleton” consisting of social networks, maps and remote systems constituting a digital counterpart of our real world, a reality that can no longer be regarded as a virtual as it becomes an integral part of everyday life. These data layers can be understood as extensions of our physical world into the realm of digital networks. Cutting, copying, pasting, linking and de-

U+1F600	U+1F601	U+1F602	U+1F603	U+1F604	U+1F605	U+1F606	U+1F607	U+1F608	U+1F609	U+1F60A	U+1F60B	U+1F60C	U+1F60D	U+1F60E	U+1F60F
😊	😄	😁	😆	😅	😂	😇	😈	😹	😺	😻	😼	😽	😾	😿	🙄
U+1F610	U+1F611	U+1F612	U+1F613	U+1F614	U+1F615	U+1F616	U+1F617	U+1F618	U+1F619	U+1F61A	U+1F61B	U+1F61C	U+1F61D	U+1F61E	U+1F61F
😬	😭	😮	😯	😰	😱	😲	😳	😴	😵	😶	😷	😸	😹	😺	😻
U+1F620	U+1F621	U+1F622	U+1F623	U+1F624	U+1F625	U+1F626	U+1F627	U+1F628	U+1F629	U+1F62A	U+1F62B	U+1F62C	U+1F62D	U+1F62E	U+1F62F
😼	😽	😾	😿	🙄	🙅	🙆	🙇	🙈	🙉	🙊	🙋	🙌	🙍	🙎	🙏
U+1F630	U+1F631	U+1F632	U+1F633	U+1F634	U+1F635	U+1F636	U+1F637	U+1F638	U+1F639	U+1F63A	U+1F63B	U+1F63C	U+1F63D	U+1F63E	U+1F63F
🙐	🙑	🙒	🙓	🙔	🙕	🙖	🙗	🙘	🙙	🙚	🙛	🙜	🙝	🙞	🙟
U+1F640	U+1F641	U+1F642	U+1F643	U+1F644	U+1F645	U+1F646	U+1F647	U+1F648	U+1F649	U+1F64A	U+1F64B	U+1F64C	U+1F64D	U+1F64E	U+1F64F
🙠	🙡	🙢	🙣	🙤	🙥	🙦	🙧	🙨	🙩	🙪	🙫	🙬	🙭	🙮	🙯

Fig. 3. Unicode Emoticon Set - (Image courtesy: Antonsusi [CC BY 3.0 de])

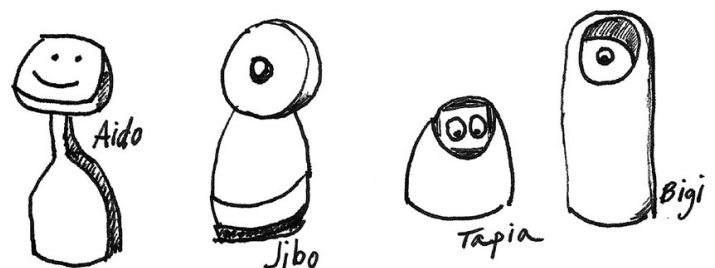
letting represent a whole set of linguistic conventions established within the graphic user interface discipline. Animation represent the temporal aspects of the digital grammar being adopted by a digitally native generation.

Tangible User Interfaces (TUIs) approach natural gestures as a form of human computer interaction. The Apple iPhone is one the early adopters of this kind of interface, permitting users to interact directly on a screen that reacts by displaying animated feedback. “Emoticons”, commonly used in a variety of applications, specifically messaging and social networks, not only serve as symbols of objects, activities or actions. Emoticons, as conveyed by the name itself, express emotions and expressivity in a nonverbal way and they can be animated further emphasize the intended feeling (happiness, sadness, etc.) in GIFs and stickers.

Animation and Robots

Tamagotchi and Furby are toys introduced in the 1990s can be seen as early examples of social robots as they promoted social interaction with their users. The Tamagotchi is displayed as a low resolution animation on a tiny LCD screen, Furby moves like an automatic stop-motion puppet. Understanding animated character design seems to have been an approach to make robots more attractive to kids and has been a practice adopted by many social robot designers. A variety of social robots were introduced in the consumer market starting in 2015, most of them serving as mobile personal assistants, performing tasks such as reading children’s stories, booking airline tickets, picking up a soundtrack for dinner or checking if you turned off the lights when you left home. I would highlight Cozmo, a dog like tractor robot the sells under US\$ 300, When developing the product, Anki Industry hired Carlos Baena, a veteran animator from Pixar to work as Cozmo’s character director [34], developing his expressions and reactions, an successful example of how the robotic industry is approaching animation professionals.

Fig. 4. Cartoon-like Social Robots; Aido, Jibo, Tapia and Bigi (Illustration by the author)



4. Conclusions

Digital graphic communication today is no longer limited to printing processes. Online distribution has made mechanical reproduction obsolete as copies have been replaced by cloned representations graphically displayed on a myriad of digital screens,. Today we read our newspapers, magazines and books on tablets, computers and phones. Billboards and posters have evolved into dynamic media present everywhere: at bus stops, airports, retail outlets and automated teller machines. In all cases, previously static media has now become a medium for animated media.

As global culture becomes more and more connected through digital networks, it becomes noticeable how animation is becoming ubiquitous and an integral part of the cybernetic and mediated society we live in. Animation therefore becomes a form of speech between humans and this networked culture, either as an interface or as representation giving temporal form to objects.

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