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How Computers Re-Animated Hand-made Processes for Artistic Animation

This paper is indebted to the invaluable contribution of numerous animation artists, who shared with us via an open survey their experiences and opinions concerning the newly available technologies, and how they have influenced – or not – the evolution of their animation style: new resources and possibilities of digital production, advantages have they discovered, and which disadvantages they endure, ultimately providing innovative ideas to achieve better results.¹

Introduction

Computer animation, which has become commonplace in animated films since the late 1980s, not only has not caused a decline in traditional animation, as might be expected, but rather has ironically helped to enhance the profile of the pioneer hand-made animation techniques, particularly by replicating so-called “traditional” drawing and painting tools and terminology in computer graphics programs. These digital tools reproduce the visual imprints and even the names of the traditional ones: brush, airbrush, colour palette, canvas, etc. Digital art does not interrupt hand-made processes and aesthetics, but rather, has given them a new life. In this framework, the evolution of animation as an art form is intrinsically joined to the development of technology. This is essential to the arts and especially crucial for animation, though in this case the evolution contributes to transformations in animation processes. Contemporary independent animators whose most common productions are short films, such as Joanna Quinn, Florence Mialhe, or Vuk Jevremovic, have contributed significantly to this evolution. These artists have paradoxically expanded the possibilities of their graphic and pictorial animated languages with the assistance of digital editing, achieving more effectively the desired hand-made aesthetic result. On the other hand, both veteran and emerging animators have approached digital images with the intention to extend their artistic endeavors, such as drawing, painting and illustration, into the realm of motion.

With this stylistic shift in mind, many software and accessories for digital drawing and animating increasingly focus on allowing for the reproduction of hand-made-like styles and textures, and some of them even create in the user the illusion of working with traditional tools. Most notably, software companies such as Adobe, accomplish this by introducing tools as pencils, eraser or brushes in Photoshop, the use of cut-outs in Flash, or the multiplane camera in After Effects. This fluid interchange ultimately generates a paradoxical relationship between digital revolution and crafts: despite its virtuality, editing software provides a working interface that allows the artist- animator to express their intentions in a more direct way than traditional or material means such as like the Rostrum camera and cels could provide in translating sketches and drawings to the definitive form of film. This paper examines the changes hand-made, or traditional animation has experienced over for the last twenty years (1995-2012) of the digital age, highlighting the revitalization of animated drawing, painting and engraving, through the use of digital tools in their production process.

¹ Álvarez Sarrat, S., Lorenzo Hernández, M., 2010. Private Survey by e-mail.

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A Taxonomy of Artistic Animation: The Moving Visual Arts of the 20th Century

While artistic animation embraces a wide stylistic, conceptual and technical spectrum, this section will focus on films and authors who use animation as an expressive means that join together aesthetic and storytelling values, analysing the visual transformation experienced by animated drawing, painting and engraving through digital image processing, as opposed to large-scale commercial productions produced by major studios such as, for example, Pixar. In defining the concept of “artistic animation” we will present an overview of the fine artists who dived into animation to extend their artistic activity.

From its beginnings, cinema provided artists with the possibility to develop their artistic work in duration. The attractiveness of such potentiality is explained by Léopold Survage (1988) in these terms: “Everything that is accessible to us has its duration in time, which finds its strongest manifestation in rhythm, action and movement.”² A significant number of artists from the avant-garde art movements of the 1920s and 30s, particularly those operating under the formal strictures of the Bauhaus or German Expressionism, were seduced by the possibilities of animation. For artists like Walter Ruttmann, Hans Richter, Viking Eggeling, Oskar Fischinger, or later Mary Ellen Butte, Alexandre Alexeïeff and Norman McLaren, the move from fine art to filmmaking was a constant source of renewal for their concepts and aesthetics through the practice of animation. Animation historian Cecile Starr (1987) differentiates between artistic animation and the mainstream animation of the time, such as *The Adventures of Felix* (1919), by Pat Sullivan, *Dizzy Dishes* (1930), by Fleisher Brothers, or *Three Little Pigs* (1933), *Snow White and the Seven Dwarfs* (1937), both by Walt Disney. Artistic animation, in Starr’s formulation, was “the new name of an art that began early in this [the last] century, when Futurist, Dadaist and other modern artists were eyeing the motion picture as the medium that could add movement to their paintings and graphic designs.”³ Although much time has passed since the avant-garde period, the hybridization of various art forms that characterizes contemporary culture, alongside the spectacular digital revolution at the end of 20th century, has made it possible for animation to re-experience a shift towards unexpected fields. The ongoing transformation of the medium reveals the central role visual art plays in contemporary independent or experimental animation, as it is a medium in which artist-animators can naturally integrate different disciplines into moving images.

Artistic animation, moreover, has never been opposed to technological innovation, since many animation painters⁴ tried to revise their visual language through devices of their own invention, or implementing new techniques. Some of these innovations were successful, like Mary Ellen Butte’s electronic animations, or Len Lye’s and Norman McLaren’s scratching on film. Some other artists created less durable inventions, such as Oskar Fischinger’s machine for shooting layers of wax. On its own, animation has the power to re-animate visual arts in

² Survage, L., in Starr, C., Russett, R., 1988. *Experimental Animation. Origins of a New Art*. 2nd ed., New York: Da Capo Press, p. 36.

³ Starr, Cecile, 1987, “Fine Art Animation”, <http://mypage.direct.ca/w/writer/FAA.html#Starr> [Accessed 15 March 2011].

⁴ We refer the term *painter-filmmaker* as it is quoted in Sara Alvarez Sarrat’s PhD research titled *La Animación: un espacio para el Arte. La Pintura Animada en la última década del siglo XX (Animation: a Space for Art. Animated-Painting in the last Decade of the 20th Century)*, 2002), which embodies the evolution of the terms *animation-painting* and *painter-filmmaker* in the main bibliographic resources. The origins of its early definition are situated in the experimental work of Arnaldo Ginna (1910), as well as in the painting series *Colored Rhythms* (1914), by Léopold Survage, that despite never being filmed, led him to declare: “I will animate my painting, I will give it movement” (Starr, C., Russett, R., 1976: 36). The same idea appeared years later at the film *Motion Painting n° 1* (1947), by Oskar Fischinger, and it was linked to the subsequent declaration, made by Giannalberto Bendazzi: “La Peinture dans la durée” (Bendazzi, G., 1978: 54.). Other artists, such as independent filmmaker Stephen X. Arthur, used explicitly the term *animated-painting* (ARTHUR, S. X., 1999: <http://mypage.direct.ca/w/writer/Vogel.html>). Both terms have been consolidated in time, conforming part of the title in two referential monograph volumes: *Raoul Servais. Itinéraire d’un ciné-peintre* (Moins, Ph., Temmerman, J: 1999), and *Georges Schwizgebel: Animated Paintings* (Cotte, O.: 2004).

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unpredicted ways, bringing painting to movement and music, much like Fischinger or Alexeïeff demonstrated with their early films of the 1920s or 30s. During the last two decades, artists have continued expressing themselves through animation. Their ongoing artistic endeavours are facilitated by technological advances, most notably Michaela Pavlátová, Jonahtan Hogdson and Han Hoogerbrugge. Hoogerbrugge in particular, whose films have evolved from painting and illustration towards an increasing use of digital tools to be shown as interactive devices at galleries and on the Internet, incorporates into his work a one-to-one⁵ communication (artist-spectator), which provides the technological sphere.⁶ According to Hoogerbrugge (2005), technology eliminates the intermediaries between creator and the public.

Nowadays, digital processes have become central in the development of animation. For us, it is highly significant that a special kind of animation that can be considered as artistic presides over this evolution. The need to achieve believable “hand-made” rendering effects has propelled the adoption of new technologies at traditional animation studios such as Studio Ghibli when they produced Isao Takahata’s *My Neighbours the Yamada* (1999), based on a manga by Hisaichi Ishii. Studio Ghibli wanted to replicate as accurately as possible the watercolours of the original stories. Achieving their goal of a realistically reproduced hand-made aesthetic facilitated a technological evolution at the studio, affecting all production stages in their following films and replacing traditional animation and cut-outs with 3D animation and 2D silhouettes. Further, Studio Ghibli’s achievements inspired other studios and filmmakers worldwide. The recent Spanish feature *Chico and Rita* (2010), by Oscar® award-winning filmmaker Fernando Trueba and graphic designer Javier Mariscal, is exemplary of the reasons animation is now a medium that has become more attractive for artists coming from other disciplines. In *Chico and Rita*, the main challenge was to keep the free style developed by Mariscal, in terms of the design of the characters and the intuitive and gestural strokes of painting used in the backgrounds, and adapt it to animation, using a rotoscope for the camera movements and the acting of main characters.

Nevertheless, though technical evolution casts a direct influence of the conception of “applied” or commercial work – such as cinema or videogames – in the case of artistic and independent animation these changes operate at a more practical level. In our interview with Michael Dudok de Wit (2010), he contends that “the [technological] evolution has clearly been affected on a superficial level by computers, but I’m not sure if it has been affected on a deeper level.”⁷ According to Dudok de Wit, digital technologies have revitalized animation production, resulting in crucial changes in artistic animation, most notably concerning the division of labour. Digital technologies make it easier for singular individuals or a small animation team to produce quality films, artists are more present in each stage of the production process, which allows them to preserve their personal style. Animation artists have adapted themselves to the new production systems, without great difficulties, because, as filmmaker Isabel Herguera (2010) asserts, “eventually it is not the means you use, but what you have to tell.”⁸ Herguera’s sentiments are also reflected by other filmmakers, as we will outline in our next section.

⁵ Han Hoogerbrugge, 2005, *Zoo*, <http://www.mu.nl/uk/exhibitions/past/zoo/> [Accessed 16 September 2012].

⁶ To know more, visit <http://www.hoogerbrugge.com/>

⁷ Michael Dudok de Wit in Álvarez Sarrat, S., Lorenzo Hernández, M. [email] (Private survey, 2010).

⁸ Isabel Herguera in Álvarez Sarrat, S., Lorenzo Hernández, M. [email] (Private survey, 2010).

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The Artists Talk to Us: The Evolution of Artistic Animation in the Last Ten Years

This section examines the major changes in the animation production process that the increasing implementation of digital technologies has favorably caused. These conclusions have been collected from the testimony of directors in the field of artistic animation who kindly responded to our survey. These filmmakers are from different countries and age brackets, who nevertheless share the belief that animation production does not depend on the medium, but rather on what they wish to communicate. For these artists, the fundamental purpose of animation is to create the illusion of movement and personality in action, and as such, transcend the use of technologies, either digital or traditional. The advantage of digital technologies, however, directly impacts the process of animation in two aspects: production systems and aesthetic factors.

The digital revolution has invaded many facets of everyday life, and in the case of animation it has become a more flexible medium, expanding options for filmmakers. When we initially reviewed the artists' opinions regarding this change, we concluded that the new digital tools have increased the development speed of any production process by reducing difficulties at all stages, but had the most significant impact by reducing overall production time. This reduction has substantially reduced the economic costs, and in this fashion, has made it easier for new filmmakers to produce their own films. When compared with earlier times, the most significant change in animation filmmaking processes affects how the workflow is conceived of — not the initial idea, but the production process, animation and image compositing. As Michaela Pavlatova (2010) puts it,

I don't understand how we could work without computers. But we did it, quite successfully. We planned our work more carefully; we had ability to estimate the right timing, number of frames in a movement, in the entire scene, in a film. I lost many of these skills as I started using the computers; now you can test it, you can change it, make it again...⁹

Pávlatová clearly refers to one of the main advantages offered by working with computers: the immediacy with which the results may be rendered and reviewed. Artistic animation has found a great ally in the potential for reviewing the rhythm, as well as the visuals and narrative aspects of a film as work on the film progresses. This has enhanced its formal aspect and the expressive gestures throughout the entire work process. In addition to promoting greater control over the process, continual review of the footage also facilitates improvisation and freshness, giving to the artist's freedom for re-recording, adding, removing, etc.

The visual aspects may be partially affected by the processes but, in general, "artists use one technique or another when it adapts better to their proposals,"¹⁰ as the Spanish animator Jorge Dayas (2010) noted in our survey. Although animators develop their projects using different technical or artistic solutions, in the background of their works the authors' identity remains intact, even among their commercial work, such as Raimund Krumme's animated short films or advertising films. However, for filmmakers who are more interested in the artistic aspects, adapting to new tools is not always an easy process. Personal style, for these artists, is more than a

⁹ Michaela Pávlatová in Álvarez Sarrat, S., Lorenzo Hernández, M. [email] (Private survey, 2010).

¹⁰ Jorge Dayas in Álvarez Sarrat, S., Lorenzo Hernández, M. [email] (Private survey, 2010).

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mere technique or visual gesture, since it implies a whole reflection on the creative act. As Jonathan Hodgson (2010) points out, it is easy to question one's personal identity in the production process with digital technologies. He contends that,

for a while, while I was concentrating on learning new software and adjusting to a new way of working my personal style changed a lot. I stopped focussing so much on drawing and for a while my animation became more like motion graphics. I became aware that my work had lost some of its warmth and was less emotional, so recently I have gone back to working with a more traditional drawn approach to animation, but using some of the technical shortcuts available when working with digital animation software.¹¹

Nevertheless, working with computers has led to new ways to experiment. The artists research the possibilities of new resources – software, cameras, digital drawing tablets – which not only provide an improvement of the image quality, but they also extend the formal and narrative possibilities of the medium. The entire filmmaking process can immediately checked and fixed the evolution of the work, from the beginning to the end, which has transformed animators' production methods, and give place to more freedom, as Maureen Selwood (2010) suggests:

At first I found the computer software a challenge to my methods. I felt something was being lost in translation as my helpers wanted and needed things to be defined in a way I wasn't used to. I began to enjoy the scanning which was the first stage of pleasure and then Photoshop as I could composite things more freely.¹²[xii]

The propensity for digital animation to endlessly refine or explore ideas has allowed some authors to bring animation to an increasingly conceptual level. Films such as Gil Alkabetz's *The Da Vinci Timecode* (2009) or *Travel to China* (2003) positioned the editing phase as the focus of the production process, in a departure from the traditional artisanal side of animation making, which emphasizes the stages of pre-production. In both films by the Israeli animator, a single image and a thorough job of editing and composition of visual rhythms build dramatic tension as a "crescendo," animating the picture from its visual "rhymes," or similarities, to suggest motion. Paul Bush also used a similar process for his film *While Darwin Sleeps* (2004), proposing a stimulating practical reflection about the fundamentals of animation. According to Bush's film, the sequencing of images and the persistence of vision creates motion from still lifes and borrowed pictures.

In addition to the increased pace of production, another main benefit of adopting digital technologies is the elimination of inconvenient intermediaries between visual arts and film format. Quinn and Koji Yamamura (2010) celebrate the disappearance of the limitations that cel animation imposed to their original designs; for both artists, digital editing has improved the artistic resolution of their animated drawings, with the implicit cleanliness that scanning and editing provide to them, instead of using grease pencil and acrylic painting on cels, or what they

¹¹ Jorge Dayas in Álvarez Sarrat, S., Lorenzo Hernández, M. [email] (Private survey, 2010).

¹² Maureen Selwood in Álvarez Sarrat, S., Lorenzo Hernández, M. [email] (Private survey, 2010).

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consider to be a graphic “intermediary”¹³ between their original drawings and the film print. As well, current technologies are more direct for artists and offers greater freedom, allowing them to preserve the gesture of their hand-made work in the final film print. In addition, the continuous monitoring of action, composition and rhythm leave room for more artistic control on every step of the filmmaking process, which becomes something alive.

To conclude this section, we must highlight a factor that has been for some directors an added attractive and an opportunity to create: the combination of traditional and digital techniques. Selwood (2010) notes, “I also feel that working with live footage, archival footage and making hybrid forms of animation is now easier than in the past.”¹⁴ The coexistence of means of expression in a digital context makes it more difficult to define boundaries between different art forms, as they are assimilated by animation into a new whole. Moreover, for most filmmakers, the use of digital tools such as the draw, scan, clean, contrast, multilayer, etc. functions in Adobe’s Photoshop have become so ubiquitous that they are considered to be a necessary preliminary step in image processing. Ultimately, with the development of these tools, the borders between traditional and digital work has faded in the production process of artistic animation. As such, animation is a versatile medium whose evolution is inextricably linked to the development of technology, though such evolution is often the result of overcoming subsequent technical limitations that create a new needing, as we contend in the next section.

The Challenge of Adaptation: A New Scene with New Handicaps

This section will explore the new technical aspects of artistic animation raised by the use of computers. First, we focus on the human aspects, determining when the artists need to interact with a team of specialists. We then describe the software programs used for every stage of animation making, which has caused a significant change to the processes at more conventional studios. We will conclude by outlining how new technologies have solved old limitations, such as number of layers, camera movements, mixed media, but they have also led to new boundaries, including technical specialization and team working. Our analysis of the artists’ requests to solve these limitations will also suggest new horizons for future collaborations between computer developers and animators.

Many artists have been attracted by animation as a means to explore their creative personality; the animated short film becomes an intermediate space between cinema, which requires the division of labour, and art, which privileges individuality. Animation painters, like Alexander Petrov or Caroline Leaf, have become well-known due to their tendency to work alone despite the tremendous labour behind their films, which show their personal imprint onto animated matter. However, the digital context has established new rules, in that an increase in the division of work may call into question the idea of animation as a place where artists can develop their tasks autonomously. More simply, digital technologies have established a twofold issue: when artist-animators start a film, they recruit less traditionally-skilled professionals, but inversely, when the film enters its post-production phase, they need to involve more computer-skills specialists, such as 3D animators, digital clean up, mattes, compositing and editing technicians. Therefore, the

¹³ Selwood, M. [email] (Private survey, 2010).

¹⁴ Selwood, M. [email] (Private survey, 2010).

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division of work in artistic animation is selective because initially the personal aesthetic and style of the artist-filmmaker predominates, and the process becomes only more pluralized or collaborative when it approaches the technical phases.

In most cases, dividing work among a number of professionals is not intrinsic to working with computers, but it is rather commanded by two main factors: the pressure of time, and the availability of budget. In this sense, as common before the digital era, artists tended to divide labour more often when they did commissioned jobs, such as an advertising commercial, than when they made their personal films. If, for example, an animated ad-film must be completed in a few weeks, hiring other specialists becomes vital. Commissioned films additionally tend to require more rendering, 3D and post-production effects than the personal films of these auteurs, for example, because they often include a virtual replica of the announced product, or use post-production in order to achieve a more attractive result for the public. Moreover, working with computers, especially since access to the Internet has provided independent animators the possibility to “outsource” parts of their animation process to other animators outside of their own countries. In this framework, working with computers is not the main factor that stimulates independent animators to divide their job, but undoubtedly provides a versatile platform to do so.

In general terms, artists need to hand over work to assistants when they are not updated with the latest technology, or they need to rely on a variety of software programs. Nevertheless, working with other professionals has opened the door to an interdisciplinary approach, especially between artistic animation and performance arts, such as theater, dance, and live action. Over the last ten years, artist-animators like Krumme or Selwood have brought the visual language to new productions made with dancers. In films such as Krumme’s *Der Gefängenenchor* (2003), the human body experiences distortions and transformations that the author conceives in the same way for their animation creatures.

We can conclude that the professionals who are working on an animation project are selected depending on the profile of the production and the process phase, which in the digital age is determined by the software. In our survey, the artists provided very precise information on the different software that they use in the main three steps of filmmaking: pre-production, production and post-production. The first of these phases, pre-production, includes concept art, characters’ design, story board, animatics, and layout. The production phase is focused on characters’ animation, effects, cycles, and in-betweening. The last phase, post-production, is related to final or fine-tuning tasks such as colouring, masks, integration, camera movements, and visual effects. Naturally, the answers differed according to the animators, and even for the same artist each project has diverse requirements. For some animators, especially if they tend to work alone, it was difficult to give an accurate answer for each production step, since they have their own special frameworks in which all the production phases can be mixed. But, in general, the assorted software programs they mention are in widespread use among most animators in the world.

Obviously, pre-production is the step where technology does not play so decisive a role, though the use of software it has made it faster and cheaper. Quinn (2010) notes that the work of animation directors has not changed; “computers have not really enabled me to delegate direction work.”¹⁵ Except for some assistance from Photoshop, many of the interviewed animators still draw by hand the entire pre-production on their own, such as concept and character designs,

¹⁵ Joanna Quinn in Álvarez Sarrat, S., Lorenzo Hernández, M. [email] (Private survey, 2010).

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storyboard, layouts, even when they are involved in 3D projects. Later, to assemble the animatics, they use the same editing programs that are also used during the post-production phase. The most evident improvement wrought by digital editing, working with sound and pictures together at the outset of a project is, as Amanda Forbis and Wendy Tilby (2010) contend, “wonderful and expedient – particularly as sound is such an integral part of the creative process.”¹⁶

When they reach the production stage, many animators also still design the entire animation by hand, using webcams for a rough checking. But, when animation is entirely done under camera, capturing images with better quality becomes essential. To accomplish this, the animators then use digital still cameras and programs like Stop-Motion and Dragon. The program Retas Pro is commonly employed when artists want to give their images a more hand-made aspect, not unlike like Yamamura’s drawings done with pencil, but coloured by computer, for instance. Moreover, Flash can be used for every step of production, and also for creating three-dimensional spaces by the addition of flat layers. For many animator-artists, the main contribution of 2D software is, as Alkabetz (2010) suggests, a sensation of freedom “with drawing and animating. In a way I can work in a more sketchy way, so the digital means actually let me have a more hand-made look.”¹⁷ Finally, for 3D projects, most animators prefer Maya and Lightwave, which can render abstract and surrealistic worlds like those depicted by Salvador Dalí (Destino, Dominique Monfery, 2003), or, more recently by Kathy Smith (Indefinable Moods, 2001).

Undoubtedly, post-production has been the phase most dramatically transformed by computers, in terms of colouring, masks and compositing. As Pavlátová observes, “we love how the sizes, shapes and placement of elements can be so easily be manipulated; as well, putting the images on the timeline helps us to get an immediate sense of layout, character, timing and transitions.”¹⁸ There is a wide offering of software programs that combine colouring and editing, though the most popular for animation artists who want to achieve a painterly look are TV Paint and Corel Paint. After Effects is mostly used for masks and compositing, and Final Cut for editing, a choice shared by the majority of cinema studios in general. Moreover, the Kinescope process, or printing digital images directly onto 35mm film, has revolutionized the concept of filmmaking itself. As the film is not printed until post-production is complete, any mistakes can be corrected at any point in the final process.

Additionally, it can be said that independent animators, who in the past were noteworthy for the uniqueness of their artistic approach and techniques, are now developing and expanding their individual style through digital means accessible to everyone. However, the conception of animators making films entirely by themselves because computers seem to facilitate it must be discarded. Computers provide more autonomy to authors to check the project and to foresee the global result, but their use multiply the technical specificities needed to complete a film.

Despite their many advantages, digital technologies have presented new limitations and difficulties. Disadvantages identified by the filmmakers are intrinsic to the computer framework: the virtuality of the environment, the failure of applications or the loss of data can make the animators’ work harder than it used to be with cels and a traditional Rostrum or multiplane camera. The constant need to update the software appears as their most common concern, particularly if the animator loses time and energy in adapting to them, and then they become

¹⁶ Amanda Forbis and Wendy Tilby in Álvarez Sarrat, S., Lorenzo Hernández, M. [email] (Private survey, 2010).

¹⁷ Gil Alkabetz in Álvarez Sarrat, S., Lorenzo Hernández, M. [email] (Private survey, 2010).

¹⁸ Michaela Pávlátová in Álvarez Sarrat, S., Lorenzo Hernández, M. [email] (Private survey, 2010).

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obsolete. Moreover, adapting to new software frequently forces an improvement of hardware, with the consequent economical – and environmental – waste as older hard drives themselves become obsolete. Additionally, some animators point to the difficulties in exchanging data across different software and platforms, like translating between Mac and PC. This presents a particular handicap for Flash animation, as Flash is incompatible with technologies such as the iPhone.

It is necessary to add one more factor to all these difficulties, as the psychological boundaries must be also taken into consideration. At times, the requirements for using the software can inhibit the artists' creative output; in other cases, the animator's reluctance to know about these programs may turn into the biggest limitation, even for young animators who have grown up with computers. It is thus important to let the artists know that they can really develop a relationship with software that can be learned in stages.

Among the specific handicaps experienced by animation artists, we must underline the difficulties to replicate digitally a painterly look, akin to oil painting or tempera. However, sometimes they achieve remarkable results, very close to their entirely hand-made animated films, such as Tilby and Forbis' Oscar® nominated short film *Wild Life* (2012). On the other hand, scanning and compositing in the computer is still very labour intensive, particularly when animators wish to keep a fresh style of drawing with open lines, akin to Quinn's work or that of Bill Plympton. Ultimately, animating with a computer can remove the 'real' drawing experience from artists, who miss the real size of working with paper on a table.

In order to solve most of these problems, the ability to cross over between different programs has been one of the main requests: mixing Flash and TV Paint, for example, or developing a Flash version suitable for working with pixels would reduce production time. The usability of the different software is another variable that animators would love to combine. Some of them believe that the interface of TV Paint is not as user-friendly as Photoshop's. Equally, for those animators who want to achieve a painterly result, they would prefer to use a Photoshop version closer to TV Paint in terms of variable color brushes and flexibility with bleed, blending and saturation. Significantly, Jonathan Hodgson even suggested working in a different context than traditional desktop computers: "I would love to have TVP Animation, After Effects and Photoshop working on an iPad so that I could work almost anywhere with ease. I'm sure this innovation is just around the corner."¹⁹

Some artists also mention the need to apply textile or real matter textures to reach a more natural hand-made look. This would require a more advanced hybridization of the process to take these textures into the digital environment. Another interesting idea – suggested by Vuk Jevremović – is to develop drawing applications to reproduce the effects of real matter. For instance, a virtual eraser, with similarities to a real one, would remove and blur the lines analogous to manual erasing. In this sense, the use of any program should be as natural as paper and pencil. Nowadays, this thought inspires animation software and hardware developers, whose target is to make the computer as familiar as possible to the artist. In this sense, we can find new supplies and accessories such as touch screens where the animator can draw directly with a variety of optical pencils that will eventually replace the pencil, the eraser, the airbrush, etc.

Ultimately, we believe that the improvements suggested by animation artists will advance the medium in new directions. These improvements would provide individual animators or small studios an opening to produce more commercial formats such as long features and series, with

¹⁹ Jonathan Hodgson in Álvarez Sarrat, S., Lorenzo Hernández, M. [email] (Private survey, 2010).

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the same visual quality of their short films. The aesthetics of artistic animation could, in return, be assumed by mainstream production, even influencing other cinematic platforms such as Internet animation or video games.

Conclusions

Computers have not yet enabled artists to delegate direction work, although they have clearly transformed animation processes, subjects and aesthetics. Computer-assisted artistic animation has had unexpected results, such as an increase in the production of artistic films, as well as it has brought technology and arts much closer together.

As we mention in our introduction, there has been a noticeable improvement of the quality of artistic films done by acclaimed animators who started their careers in the 1980s, a period linked to the introduction of computers in animation. Overall, digital editing has made it easier to achieve a genuine hand-made aesthetic, as opposed to pre-digital or cel animation techniques. Moreover, the implementation of digital technologies into animation filmmaking has complemented and expanded hand-made processes directly under the camera. In post-production, it is now possible to overlap incompatible techniques under the camera, such as oil painting and sand. Additionally, animation can interact with visual effects that give more depth and consistency to this invented world, as can be observed in films which combine hand-made aesthetics and 3D objects and backgrounds, like the famous proposal by Anthony Lucas to re-envision silhouette animation in his Oscar® nominated film, *The Mysterious Geographic Explorations of Jasper Morello* (2005).

With all of the available digital options, many artists have adapted successfully to an entirely digital framework, re-formulating their personal style through the newest animation software. As well, digital technologies have made it easier for other independent animators to move to live action means and even to other platforms, destabilizing the limits of animation and cinema. The boundaries between Fine Arts and animation have similarly collapsed when mediums like engraving or painting are entirely re-invented through new technologies, as we can see in experimental films such as Simon Goulet's *Oïo* (2003), which features the transformation of an "action-painting" into animated images through an intensive editing process.


In this framework, many young and emerging animators have revealed themselves as animation artists via their student and debut films. Works like Bastien Dubois's *Madagascar: Carnet de Voyage* (2009) or Inès Sedan's *L'homme qui dort* (2009) display a rich variety of graphic styles, textures and painterly effects. The films by these *nouvelle* artists who have learned art and animation concurrently with mastering software programs demonstrate that digital means are a viable alternative to traditional tools, because their technological development imitates artistic development.

Nevertheless, we must note some restrictions and even loss of abilities, which have been inherent to the adaptation to digital technologies. The possibility of exploring ideas and fixing mistakes endlessly can eventually become a disadvantage, because there are no constraints and no risks. Probably due to this reason, a minority of authors decided not to use computers after a first or second experience, most notably Georges Schwizgebel after his experience filming *The Man without a Shadow* (*L'homme sans ombre*, 2004). This rejection becomes more significant when an entire animation factory such as Studio Ghibli purposely rejected digital applications when they developed their latest film, *Ponyo on the Cliff by the Sea* (*Gake no ue no Ponyo*, Hayao Miyazaki, 2008) in order to return to an aesthetic of traditionally-drawn animation.

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Despite the notable rejections of digital technologies, the number of artistically-animated digital films has increased overall. The application of digital techniques to longer independent animated features, however, has mixed results. The Spanish production *De Profundis* (2006), a poetic long-feature developed by only one illustrator, Miguelanxo Prado, is deserving of special mention here. Though the animation style seemed quite limited, it served the author's purposes well, as the film is focused more on musicality and abstraction than on narrative or storytelling. Another remarkable example in this vein is the French collective long feature *Fear[s] of the Dark* (*Peur[s] du noir*, Etienne Robial, 2007), composed by episodes designed by famous European comic artists such as Blutch or Lorenzo Mattotti. This film in particular demonstrates that a fragmentary, artistic style is, in fact, compatible with in a feature-length format.

In conclusion, we must point to future challenges for the fusion of artistic animation and new technologies. For long features, a hand-made aspect could become a very appealing alternative, in that the acquisition of an artistic visual language would invigorate the European animation industry because of its potential to attract an adult audience to animation screenings at cinemas. As well, the use of simulated hand-made graphics is nowadays a strong proposition for video games, now that several studios, including Japan's Platinum Games, have established alternative aesthetics that integrate two-dimensional animation with 3D environments to satisfy an increasing number of young and adult users.

In this new digital landscape, the role of the animator artist becomes very different than Oskar Fischinger's or Norman McLaren's but, undoubtedly, the work of animators who research and experiment on their own has been increased, because each time there is more room for the animators who animate the films they wish to see. 

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