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Avoid Setup: Insights and Implications of Generative Cinema

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ABSTRACT

Generative artists engage the poetic and expressive potentials of film playfully and efficiently, with explicit or implicit critique of cinema in a broader cultural context. This paper looks at the incentives, insights, and implications of generative cinema, which significantly expands the creative realm for artists working with film, but also incites critical assessment of the business-oriented algorithmic strategies in the film industry. The poetic divergence, technical fluency, and conceptual cogency of generative cinema successfully demonstrate that the authorship evolves toward ever more abstract reflection and cognition which equally treat the existing creative achievements as inspirations, sources of knowledge, and tools.

Introduction

This paper is motivated by the observation that there are complex connections between the creativity of cinematography and the procedural fluency which is essential to generative art. These connections have been targeted implicitly or explicitly by the artists of generative cinema but remain virtually untouched in theoretical discourse. Film studies have traditionally been focused on the historical, narrative, formal, aesthetic, and political aspects of the relations between cinema, technology, culture, media, and other art forms. Theoretical studies in new media art primarily address these relations on the conceptual, material, and phenomenological levels, investigating and comparing how the different references of information are captured, stored, manipulated, retrieved, and perceived in film and digital media. In *Cinema and the Code*, Gene Youngblood anticipates the creative potentials of the algorithmic foundation of code-based processing of the formal elements in film, but never explicates them [1].

This paper explores generative cinema by discussing the successful and thought-provoking projects which represent relevant approaches toward cinema in generative art and exemplify the artists' abilities to transcend the conceptual, expressive, and aesthetic limits of code-based art. The theme is observed primarily from the aspect of the artists' creative thinking and critical evaluation, with the aim to show that the cognitive tensions between film and generative art have significant expressive, intellectual, and ethical implications which could benefit both fields. The goal of the paper is also to encourage further theoretical and practical research in generative cinema.

Generative Cinema

The immense poetic and expressive potentials of film have been barely realized within the cinematic cultural legacy, mainly due to industrialization, commercialization, politicization, and consequent adherence to the pop-cultural paradigms [2]. Unrestrained by commercial imperatives, motivated by unconventional views of film, animation, and art in general, generative artists have started to engage these potentials playfully and efficiently, with explicit or implicit critique of cinema in a broader cultural, economic, and political context.

The conceptions of generative art in contemporary discourse vary in inclusiveness [3–8]. In this paper, generative art is perceived broadly, as a heterogeneous realm of artistic approaches based upon combining the predefined elements with different factors of unpredictability in conceptualizing, producing, and presenting the artwork, thus formalizing the uncontrollability of the creative process and underlining the contextual nature of art [9, 10]. Consequently, generative cinema is understood as the development and application of generative art methodologies in working with film both as a medium and as the source material.

Generative cinema has been an emerging field in digital art for the past 20 years. Before that, generative techniques had seldom been explored in both conventional and experimental film [11–13]. As a logical extension of generative animation [14], generative cinema in digital art became feasible with the introduction of affordable tools for digital recording and editing of video and film. It expanded technically, methodologically, and conceptually with the development of computational techniques for manipulating large numbers of images, audio samples, indexes, and other types of relevant film data. Diversifying beyond purely computation-based generativity—which drew considerable and well-deserved criticism [15]—the production of generative cinema unfolds into a number of practices with different poetics and incentives. Here are some examples.

Supercut

Cristian Marclay's *Telephones* (1995) used supercut as a generative mixer of conventional cinematic situations involving phone calls. Supercut is an edited set of short video and/or film sequences selected and extracted from their sources according to at least one recognizable criterion. Focusing on specific words, phrases, scene blockings, visual compositions, camera dynamics, etc., supercuts often accentuate the repetitiveness of narrative and technical clichés in film and television.

With the explosion of online video sharing, supercut became a pop-cultural genre but remained a potent artistic device, for example in work by Jennifer and Kevin McCoy, Tracey Moffatt, Marco Brambilla, and Kelly Mark. It was charged with political and meta-political critique in R. Luke DuBois' brilliant *Acceptance* projects (2012 and 2016) (Figure 1), the two-channel video installations in which the acceptance speeches given by the two major-party presidential candidates (Obama and Romney in 2012, Clinton and Trump in 2016) are continuously synchronized to the words and phrases each of them speaks, which are 75–80% identical but distributed differently.

The conceptual and technical logic of supercut received a fundamental critical assessment with Sam Lavigne's Python applications *Videogrep* (2014), which generates supercuts by using the semantic analysis of video subtitles to match the segments with selected words, and *Audiogrep* (2015), which transcribes audio files and creates audio supercuts based on the input search phrases.

Statistical

Classification, indexing and systematic quantification of formal qualities in time-based media allow for building databases which can be handled and manipulated with statistical tools. This enables artists to make alternative visualizations and temporal mappings that reveal the overall visual and structural logic of popular films.

The idea of unconventional editing and presentation of film has been explored in a number of projects. *Soft Cinema: Navigating the Database* (2002–2003), by Lev Manovich and Andreas

Figure 1. R. Luke DuBois, *Acceptance 2016* (2016). (Courtesy of the artist.)

Kratky, demonstrates Manovich's view of the cinema as a digital (discrete) medium and of the film as a database. The project was based on classifying and tagging a set of stored video clips, algorithmically creating the editing scenarios in real time, and on devising a user interface for arranging, navigating, and playing the material [16].

Programmed manipulation of digitized film also enables artists to statistically process films frame by frame, for example in Ben Fry's *Disgrand* (1998), in Ryland Wharton's *Palette Reduction* (2009), and in Jim Campbell's *Illuminated Average Series* (2000–2009), which averages and merges all the frames from Orson Welles' *Citizen Kane* (1941) and Hitchcock's *Psycho* (1960) [17].

In *Portrait* (Figure 2), Shinseungback Kimyonghun used computer vision in the statistical style of Jim Campbell and Jason Salavon. The software detects faces in every 24th frame of a selected movie, averages and blends them into one composite with the dominant facial identity of a movie, stressing the figurative paradigm in mainstream cinema.

Figure 2. Shinseungback Kimyonghun, *Portrait (Bourne Identity and Taxi Driver)* (2013). (Courtesy of the artists.)

The classic conceptual, formal, and experiential form of the infographic processing of film was achieved in Frederic Brodbeck's *Cinematics* (2011). Its core is a Python-based online application for interactive visualization and analysis of loaded films according to a number of criteria such as duration, average luminance and chromatic values, number of cuts, dynamics of movement in sequences, comparisons between different genres, original film versions vs. remakes, films by the same director, films by different directors, etc. [18].

Crowdsourced

As an old method for outsourcing complex, iterative, or otherwise demanding projects to many participants who are expected to make relatively small contributions, crowdsourcing has significantly evolved with the internet (and has often been skillfully exploited), from the SETI@home screensaver in the early WWW, to FoldIt, Kickstarter, Wikipedia, CAPTCHA, social networking, and social media platforms.

In *Man with a Movie Camera: The Global Remake* (2008), Perry Bard combines online participation with automatic selection of crowdsourced video clips to make a shot-by-shot interpretation of Dziga Vertov's seminal eponymous film, *Человек с киноаппаратом* (1929). A similar idea, the surrealist "exquisite corpse" method for sequential collaging of found video clips, is behind João Henrique Wilbert's *Exquisite Clock* (2009), which constructs a digital clock with six screens showing the uploaded users' free-style photographic interpretations of decimal digits.

With *The Pirate Cinema* (Figure 3) Nicolas Maigret brings real-time robotic sampling of film to the world of peer-to-peer exchange. The installation uses a computer that constantly downloads the 100 most viewed torrents on a tracker website, intercepts the currently downloading video/audio snippets, projects them on the screen with the information on their origins and destinations, discards them and repeats the process with the next stream in the download queue [19].

The idea of expanding the conventional film structure with crowdsourced, programmatically arranged and interactively manipulable content was polished up and designed to consequently

Figure 3. Nicolas Maigret, *The Pirate Cinema* (2012-2014). (Courtesy of the artist.)

reflect the logic of online video sharing in Jono Brandell and George Michael Brower's *Life in a Day Touchscreen Gallery* (2011). It is a highly configurable platform for organizing, sorting, and screening the clip selections of all the 80,000 short video submissions to a traditionally scripted and edited crowdsourcing film, *Life in a Day*, directed by Kevin Macdonald (2010), which used around 10,000 selected video clips. The fact that *Touchscreen Gallery* was a sideshow instead of being central to the *Life in a Day* project reflects the dominant ideology of mainstream cinema.

Deanimated

One of the most impressive critical deconstructions of the structural and audio-visual conventions in cinema was achieved by Martin Arnold with *Deanimated* (Figure 4). He successively removed both visual and sonic manifestations of the actors in Joseph H. Lewis's B-movie thriller *The Invisible Ghost* (1941), and then consistently retouched the image and sound so that the film's final 15 minutes show only empty spaces accompanied by the crackling of the soundtrack [20].

Figure 4. Martin Arnold, *Deanimated* (2002): corresponding stills from *Invisible Ghost* (left) and *Deanimated* (right). (Courtesy of the artist.)

Similarly motivated to avoid the figurative and narrative dictates of film tradition, Vladimir Todorović combines generative animations with voiceover narration and ambient soundtrack in *The Snail on the Slope* (2009), *Silica-esc* (2010), and *1985* (2013). *1985* (Figure 5) is an abstract rendition of the fictional activities of the ministries of Peace, Love, Plenty, and Truth that govern Oceania one year after the events in George Orwell's *1984* (1949). Its uncanny ambience relies on sudden changes of sound and image, triggered by the random walk algorithm which was modified with cosine function, accelerated and decelerated.

Documentary narrative structure can also be transcended, for example in Jonathan Minard and James George's computer film *CLOUDS* (2015), which dynamically links real-time generative animations and sound with pre-recorded documentary footage.

Figure 5. Vladimir Todorovi , 1985 (2013). (Courtesy of the artist.)

Condensed

In *Fast Film* (Figure 6), Virgil Widrich intelligently expanded the possibilities for reproducing and interpreting film snippets in order to accentuate the fascinations, obsessions, and stereotypes of conventional cinema. *Fast Film* was created by paper-printing the frames from selected film sequences, reshaping, warping, and tearing them up into new animated compositions. In its exciting 14 minutes of runtime, *Fast Film* provides an elegant and engaging critical condensation of key cinematic themes, such as romance, abduction, chase, fight, and deliverance.

Figure 6. Virgil Widrich, *Fast Film* (2003). (Courtesy of the artist.)

Nine years later, György Pálfi exploited this narrative methodology, along with the achievements of supercut art and culture, to produce the feature-length movie *Final Cut: Ladies and Gentlemen* (2012) out of short sequences from 450 popular films and cartoons. Although it proved to be barely watchable in continuity due to the fundamental incompatibility

between rapid editing of incoherent imagery and long running time, film critics praised it as “an ode to cinema” [21].

Synthesized

The concept of real-time procedural audiovisual synthesis from an arbitrary sample pool, in contrast, elevates the film structure by following the essential logic of cinema. This was achieved by Sven König in *sCrAmBlEd?HaCkZ!* (2006), which uses psychoacoustic techniques to calculate the spectrum signatures of the sound snippets from stored video materials and saves them in a multidimensional database that is searched in real time to mimic any input sound by playing the matching audio snippets and their corresponding videos [22]. Perhaps this innovative project was largely overlooked because König used the *sCrAmBlEd?HaCkZ!* software mainly for VJing rather than for developing complex artworks by establishing the specific relations between the sources

of stored and input materials.

Procedural audiovisual synthesis was advanced through the application of neural networking and machine learning by Parag Kumar Mital in *YouTube Smash Up* (Figure 7). Each week, this online software takes the #1 YouTube video of the week and resynthesizes it using an algorithm that collages appropriate fragments of sonic and visual material coming only from the remaining Top 10 YouTube videos [23]. It produces a surreal animated effect, visually resembling Arcimboldo's grotesque pareidolic compositions [24].

Figure 7. Parag Kumar Mital, *YouTube Smash Up: Emotional Baby! Too Cute!* (from 2012). (Courtesy of the artist.)

The more demanding, machine-based synthesis of coherent film structure and plausible narrative was tackled by Oscar Sharp and Ross Goodwin in *Sunspring* (Figure 8), which was their entry in the 48-Hour Film Challenge of the Sci-Fi London film festival. Experienced in natural language processing and neural networks, Goodwin programmed a long short-term memory recurrent neural network and, for the learning stage, supplied it with a number of 1980s and 1990s sci-fi movie screenplays found on the internet. The software, which appropriately “named” itself Benjamin, generated the screenplay as well as the screen directions around the given prompts, and Sharp produced *Sunspring* accordingly.

The film brims with awkward lines and plot inconsistencies, but it qualified among the top 10 festival entries, and inspired one of the judges to remark, “I’ll give them top marks if they promise never to do this again” [25]. *Sunspring* playfully reverses the “Deep Content” technology of the What is My Movie web service, which analyzes transcripts, audiovisual patterns and any form of data feed that describes the video content itself, and automatically converts it into advanced metadata which is then processed by a machine learning system that matches the metadata with the natural language queries [26].

A Void Setup

All these approaches in generative cinema point to the powerful algorithmic concepts for freely, parametrically, and/or analytically generating cinematic structure, narrative, composition, editing, presentation, and interaction. One such concept proposes a flexible system for automatic

Figure 8. Oscar Sharp and Ross Goodwin, *Sunspring* (2016). (Courtesy of the artists.)

arrangement of manually tagged film clips, or their arrangement according to input parameters [27]. A more complex one would be able to combine computer vision, semantic analysis, and machine learning to recognize various categories and reconstruct plots from a set of arbitrarily collected shots, sequences, or entire films, and to transform and reconfigure these elements according to a wide range of artist-defined criteria that substantially surpass those in conventional film.

The algorithmic tools of generative cinema significantly expand the realm of creative methodologies for artists working with film and animation. They provide artists with new insights into conceptual, formal, and expressive elements of film and animation, which can be enhanced through experimentation. Furthermore, the algorithmic principles of the successful generative cinema artworks, regardless of their technical transparency, can be inferred, repurposed, and developed into new projects with radically different poetic identities and outcomes. These creative capacities also provide a specific context for the critical assessment of conventional film.

Just as it clumsily borrowed or re-purposed ideas from the avant-garde, mainstream cinema has been systematically exploiting some aesthetic effects and themes of digital generative art, with little understanding of the intellectual values behind generative methodologies. This superficial exploitation is revealed in goofs spotted by informed viewers. When the commercial film tries to utilize algorithms as creative tools, it does so ineptly and ineffectually, reflecting its rigid ideology, as exemplified by Macdonald's *Life in a Day* and Pálfi's *Final Cut*.

The algorithmic strategies that the film industry applies successfully are those for conceptualization, script evaluation, box-office assessment, and other business-related aspects of production, distribution, and marketing. Major production companies, such as Relativity Media in Hollywood, use statistical processing of screenplay drafts, while consulting services, such as Epagogix, offer their clients the big-data-based predictions of their films' market performance [28–30]. The outcry over the ultimate loss of creativity, provoked by media disclosures on these practices is, however, either naive or cynical because business-related algorithms have always been integral to big-budget filmmaking [31].

Struggling with competitive new media and art forms, the film industry today is unable to transcend and unwilling to hide its reliance on communicating a subset of human universals [32]. Therefore, it runs its business more consciously and rationally, focusing the algorithms on market analysis, target group research, risk assessment, and screenplay design, all the way to the

test-screening evaluations corresponding to the debugging procedures in computer coding. While this pragmatic algorithmization seems logical, it is creatively counterproductive and a global mass-market film industry could benefit from generative cinema only if it takes certain commercial risks and opens up to the experimental incentives of its creative talents.

Unrestrained by commercial imperatives, motivated by unconventional views on film, animation, and art in general, generative artists develop new approaches and methodologies which can be advanced and repurposed by other artists, stir our amazement with the moving image, and broaden our critical understanding of the cinema as cultural product. In this regard, the poetic divergence, the technical fluency, and the conceptual cogency of generative cinema successfully demonstrate that authorship evolves toward ever more abstract reflection and cognition which equally treat existing creative achievements as inspirations, sources of knowledge, and tools.

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