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THE ALGORITHMIC TURN IN THE FOUND FOOTAGE FILMMAKING THE DIGITAL REMAKE

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ABSTRACT

With digital technology arrive new possibilities for close analysis, quotation, juxtaposition and live, or time-based, experiential forms of comparison: The Digital Remake *refers to the contemporary practices which are recycling art cinema classics into new media "artifacts" through a process dependent on the new interstice of software, an algorithmically enabled work process, and the availability of the Internet. These works place emphasis on interface rather than physicality, and they play in-between and on constructing systems that handle and reconfigure pre-existing media into new patterns: artists create software that o er themselves and users a form of empowerment and control that creates an entirely di erent order of interactive narratives than the conventional ones.*

The following paper will examine Perry Bard's Man With A Movie Camera: The Global Remake *in the perspective of remake culture, participatory authorship, database narrative, and movies driven by a software algorithms to present the many elements through which the development of the avant-garde tactics of appropriation are using the language of new media. Secondly, the new contemporary ontology of analyzing movies as contemporary cultural data will be presented through similar approaches and projects as Lev Manovich is* Visualizing Vertov.

#remake, #digital remake, #algorithm, #visualization
doi:10.21096/disegno_2016_1-2am

With digital technology arrive new possibilities for close analysis, quotation, juxtaposition and live, or time-based, experiential forms of comparison: *The Digital Remake* refers to the contemporary practices which are recycling art cinema classics into new media "artifacts" through a process dependent on the new interstice of software, an algorithmically enabled work process and the availability of the Internet. These works place emphasis on interface rather than physicality, and they play in-between and on constructing systems that handle and reconfigure pre-existing media into new patterns: artists create software that o□er themselves and users a form of empowerment and control that creates an entirely di□erent order of interactive narratives than the conventional ones.

The series of works that remake the products of film history using new media technologies reflect upon the ways cinema is subject to the laws of the algorithm and the database, and emblematizes the new mutability and transportability of moving images after digitization: "the image is no longer a given, but an instantiation of code to be algorithmically manipulated, processed and disseminated in endless new ways. Critical attention has been directed toward the instability and malleability of the image" (Røssaak 2001, 16).

The following paper analyzes the changing vocation of the movies after they became technological objects of a di□erent kind, that is, programmable objects: according to Manovich all programmable objects are composed of digital codes and are subject to algorithmic manipulation. Put simply, algorithms describe how a computer can carry out the task you want it to do. They are expressed in a form called a program or software. They accept an input and produce an output. A text or an image that undergoes this kind of treatment becomes a programmable object, or "softwareized" (Manovich 2001, 49). The turn toward the algorithm could, as Laura Marks would argue, as easily be called a turn toward information, code, the digital, the interface or the software (Marks 2007). These new technologies and artistic strategies produce a new interrogation of the image. Movies recycled by means of new media's technology—sensors, software, database, internet (torrent, social networks, digital archive, etc.)—are thus deconstructed by our will to control information (Rodowick 2007, 174).[1] Each time the fragmentation is di□erent and it is determined by the type of operation used to manipulate (Manovich 2013, 122) the complexities and multiple dimensions of movie data.

[1] *"Before the digital screen, we do not feel powerlessness, but rather express a will to control information and to shape ourselves and the world through the medium of information. This is also a will to measure the world and communication, or to take measure of it, and so to manage it according to mathematical means. The most di cult question, then, relates to the ethics of computational interactions; that is, evaluating our contemporary mode of existence and addressing how our ontology has changed in our interactions with computer screens." (Rodowick 2007, 174)*

The first part of the paper will examine works in which the digital remake as artistic strategy comes to manipulate, alter, and re-create the narration of cinema and question the very idea of exclusive authority in design culture.

The second part will bring together projects that reflect on the paradigm of accumulated media which enables the analysis of movies as contemporary cultural data or object.

The core of both parts will contain a discussion about Dizga Vertov's *The Man with a Movie Camera* as both "paradigms" mentioned above are exemplified in the digital remaking of this movie: examining Perry Bard's *Man With A Movie Camera: The Global Remake* in the perspective of "remake culture", participatory authorship, database narrative, movie driven by a software algorithm will present many elements through which the development of the avant-garde tactics of appropriation are using the language of new media. Secondly, the paradigm of seeing movies as contemporary cultural data will be presented through similar approaches and projects such as Lev Manovich's *Visualizing Vertov* (Manovich 2013).

In both major parts other examples will also be mentioned to indicate a growing subset of work that operates with the aforementioned specific artistic strategy of the digital remake.

PART 1

Open Source Paradigm: Peer-to-Peer networks and online archives as a source for found footage and space for participatory practices

Digital media are changing the practice of found footage filmmaking: "With new media, found footage films transcend the film archive, both as a physical location and as the only entity entitled to select film (artifacts) and make film available." Participatory platforms such as YouTube, Vimeo, UbuWeb, the Internet Archive or other commercial platforms such as Netflix, iTunes, and Ximon in the Netherlands o□er more and more varied content, including alternative and archive content.

In his *Aporias of the Digital Avant-Garde*, Steve F. Anderson acknowledges that the online networks (Peer-to-peer, YouTube, Vimeo, UbuWeb, the Internet Archive) have a transformative impact on historical avant-garde tactics of appropriation and recombination: "by recycling movies available on these networks media practitioners are enacting new forms of networked subjectivity and creativity that are characteristic of an 'open source' authoring mode." (Anderson 2007, 4). The "new" partakes of the "old" through digital integration by means of which movies of twentieth century cinema are also accessed through online peer-to-peer networks: Nicholas Maigret's *The Pirate Cinema (2013)* project reflects on the very first step of the digitized material: the Peer-to-Peer Sharing protocol which is based on file fragmentation in which small samples constitute the exchange unit or chunk.

From a cinematic perspective, such a prior cutting of the media is also a way of cutting the film material and the narration. These "broadcasting mechanics" make possible a recombinant cinema—random collages—which weaves different films by interlacing them frame by frame. He also proposes a way of perceiving the film as more than a digital stream, or rather streams, spread worldwide: "Peer to peer is much more than files sharing. What it's really about is how the computers are organized, but crucially how the people are organized. So Peer-to-Peer is a relation dynamic in a distributed network—it's a network whereby every individual has the freedom to act and the freedom to engage in relationship without asking permission [...] it permits individuals to produce, to distribute, to share, to work together with other individuals without asking permission." (Nicholas Maigret) Digitization and peer-to-peer file sharing represent the two very steps of rewriting the past in the digital environment. This process requires "the deconstruction of the traditional linear image of the past, (1) in order to show smaller units, such as events, objects, persons, texts and others; (2) by using these units, representation the past in a new way, integrating the possibilities offered by special software and/or a hypertext; (3) the integrating of large digital collections made by institutions or different online platforms' (Laak 2010, 236).

These networked practices function as a space in which the development of database structures and recombinant media are crucial practices and a space where works based on preexisting films have proliferated: "Perhaps most importantly, we must address these networks in both material and functional terms, as cultural formations that are the products of material and ideological necessity and not merely passive conduits for data. Within the realm of the manipulated movies that are distributed online and via file-sharing networks it is possible to view the rhizomatic structure of the Internet as a corrective to the Cartesian coordinates of three-dimensional space. This is particularly realized in the structure of global peer-to-peer distribution networks, which can no longer be regarded as external and posterior to the digital artwork itself. Instead, I believe we are witnessing a transformation of the digital artwork's position as fundamentally entangled with circuits of replication, recombination, dissemination, and along with them, endless potentials for productive mutation." (Anderson 2007, 5).

The Pirate Cinema shows how digital platforms provide global accessibility in the way we connect, make meaning, experience and communicate. With twenty-four hours of video uploaded every minute, three billion videos viewed every day, and tens of millions of channels, YouTube is today, eleven years after its launch in 2005, the largest online platform for audiovisual content. If Maigret's *The Pirate Cinema* project reflects on peer-to-peer distribution networks and the recombinant cinema, Jennifer Proctor (2010-2012) remakes Bruce Conner's seminal 1958 found footage film *A Movie*

(1958) using appropriated material from YouTube and LiveLeak. This work comments on the pervasiveness of footage available for appropriation in an online world, and the way disparate threads in the YouTube and LiveLeak databases can be assembled to create "a movie." As a remake, the video provides a parallel narrative that explores the changes in historical and visual icons from 1958 to 2010—and those images that remain surprisingly, and delightfully, the same.

The availability of the movies on these global platforms work almost as an invitation for viewers to imagine and create their own variations on different projects at the same time these practices are transforming virtually any electronic broadcast into potential raw materials for re-editing and redistribution: "In digital media, the act of copying has moved from figure to ground, whether at the level of the individual pixel, the sample, or the peer-to-peer network. In other words, the status of the copy is no longer at stake—it is as much of a given to digital composition as brush strokes are to painting. When addressing works that emerge from the informational space of the network, we are dealing not with originals and reproductions but memes and mutants—circuits of data flow and transformation that assert their own ontological status." (Anderson 2007, 6).

The *Hitler Rants Parodies (2009)* are one of the most famous digital remakes in the sense of popularity: numerous users take the same clip to create different meanings. The remake titles include *Hitler gets banned from Xbox Live; Hitler gets scammed on eBay and banned From PlayStation Network; Hitler wants a PS3 for Christmas but gets a Wii instead; Hitler finds out Pokemon isn't real; Hitler gets deleted from Facebook, Loses His Ipod Touch and his internet connection too.* Users download the same movie clip and upload it to YouTube with a different subtitle track creating a sort of copycat avalanche, a dialogue between the people who remake the clip. In the *Hitler Rants Parodies* the users are entirely changing the meaning that the movie clip initially had. Jaimie Baron defines these types of clips "inappropriate" since it is difficult to theorize the contemporary appropriation practices. These clips reveal the awareness fundamental to appropriation art in that a recorded image can serve multiple ends, generate originally unintended associations, and take on perverse or contradictory connotations and also focus on the viewer's awareness that the footage came from another (primary) context of use (Baron 2013, 16).

Man with a Movie Camera: The Global Remake

The term "global remake" is a kind of interactive and collective filmmaking, or as Feldman says, a "cinema made by all", a technology which makes it possible for anyone to participate in the creation of cinema. The idea is in fact a remake of Dziga Vertov's imaginary cinematic utopia put forward in such works as his *Kinoglaz* that Perry Bard in

her *Global Remake* realizes in our digital age: she takes *Man with a Movie Camera*, dissects it into sequence clips and makes it available through a website which is driven by a software (written by John Weir—now open source), and invites users to remake Dziga Vertov's movie in a "crowdsourced" way. Since 2008 Vertov's movie has been "restlessly reconfigured" on the Internet: on the left is Vertov's original and on the right is a shot uploaded from a participant. Within this work Vertov's time, the "then" of an earlier cinematic moment is thus juxtaposed with the "now" of the era of interactive digital media.

The digital aspect of *The Global Remake* is located not only in half of its source material but also in its participatory, interactive, and constantly shifting structure that collates the e□orts of many filmmakers into a new, inherently digital film every day. This online work is a collaboration between a potentially unlimited number of filmmakers around the world. Everyday a new version of the movie is built, thus, *The Global Remake* is perpetually changing; however, the presence of Vertov's images, as well as the contemporary soundtrack created by Steve Baun, remains the same from one version to the next. Manovich points out that Dziga Vertov can be seen as an early database filmmaker and that his work is the most important example of database imagination in modern media art. The original film *Man with a Movie Camera* (1929) has three levels: cameraman filming the shots, audience watching the finished film and shots from street life in Russian cities edited in chronological order of that particular day. While the last level can be seen as text or "the story", the other two can be seen as meta-texts successfully merging database and narrative into a new form. In the original film, the radical experimentation with the formal structure of the documentary is what "happens". In addition, the remake establishes this as a possibility and characteristic of how digital media defines today's interactive films/documentaries: "Computers allow a di□erent way of structuring filmic narratives. In Bard's project the software algorithm thus becomes comparable with a creative co-producer of the screened filmic remake, with the software having its own intentionality (Pedersen and Stephensen 2014, 87). The remake that has been constructed on the Internet is made automatically by a piece of software, by means of an algorithm. Random recordings are picked from a continuously updated, user-generated database of contemporary footage. The original sixty-six minute film is cut down into a series of short clips that comprise individual shots, each no more than a few seconds long, and that are at any time interchangeable, reflecting a similarity with new media objects which "lack this strong narrative component, they don't have a beginning or an end but can start or stop at any point. They are collections of discrete items coming from the database" (Manovich 1999).

The remake can cross both temporal and spatial boundaries as it reproduces existing material for new audiences, the past and present is shown side by side: Vertov's footage illustrates the industrial landscape of the 20s and the uploaded sequences translate the world today. The

software that powers this remake project thus displays variants of the film in daily rotation, so the built movie may never be quite the same. As both Vertov's and Bard's films can be accessed 24/7 on the website, Seth Feldman notes that the experience of the viewer and participant is "that two of the three montages are in flux. The 1929 film is a sort of baseline or, at least, the invocation of a baseline for the project. On the other side of the screen are the multiple images that change day-to-day, the new images that arrive, and the old ones that are not shown in any given iteration. And, of course, there is the third montage, the continually changing juxtaposition between the two sets of images." The e□ect of the 1929 work, "in juxtaposition to a stream of images responding to it" is akin to Roland Barthes' second layer of semiotic meaning (Feldman 2010). Feldman attempts to categorize some of the ways contributors' uploaded shots work in juxtaposition to Vertov's original film, providing a preliminary morphology for understanding the relationship established between the original images and the newly added images that in some way "mimic" the original: the situations when the participants upload images denotatively similar to Vertov's form a relationship that of "simple replication" (Feldman 2010).

Together, the modern replacement and Vertov's image, such as the contrast between a woman putting a letter in a mailbox and an email on computer screen, are the "chronological juxtapositions". The most popular forms of juxtaposition are the "quotation of movement" which also points to the kinetic nature of the medium and Vertov's signature (the word "Vertov" usually being translated as "spinning" or "whirling.") However, participants are also quoting stills, which breaks with the constructivist valuing of motion. Some shots function as a "contemporary commentary" as they use Vertov's original "as a jumping o□ to critique or identify the contributor's concerns with their contemporary world". The "text" (intertitles) is the part that Vertov wished to do away with and this is "almost" accomplished in the remake by participants who uploaded Vertovian cityscapes which work purely on a visual basis. The "expository metaphors" are rare contributions and "make explicit a metaphor implied by Vertov's original shot" (Feldman 2010). "Facebooking" calls attention to the maker like Vertov's film which was subtitled "From the Diary of a Film Cameraman". What is quoted in this case is the supposed cameraman himself. "Silence" is represented by the shots for which nothing has been uploaded: "deliberate non-participation", "may simply be technical" or "audience attention span". These blank spaces next to Vertov's film are contrasted with the ones that most often get remade for Bard's project: the movie theater, mobile phones which seem to revel in and celebrate new digital technology in a manner similar to Vertov's own celebration of mechanical invention. For Jaimie Baron, the split-screen format allows one to experience a temporal and intentional disparity between the original and remake within the moment of viewing the work itself on Bard's website, producing what she calls the "archive

e□ect": on the one hand, this can be produced by the spectator's phenomenological experience of a "temporal disparity" between different elements of the same text (Baron 2012, 471). In Bard's project, of course, the split-screen creates this in a direct manner (the digital images are also completely "clean"), which exposes their own lack of material existence. Thus, the contrast between the "dirtiness" and "cleanness" produced as these di□erent kinds of images are appropriated and become "archival" is one factor in the di□erential experiences of the material archive e□ect and the digital archive e□ect. Vertov's filmic images are *also* pixelated because they, too, have been transformed into digital files. Thus, the distinction between filmic and digital imagery is blurred due to the online digital interface" (Baron 2012, 471). On the other hand, also be produced by the spectator's phenomenological awareness of an "intentional disparity" between di□erent elements of the same text, in which the spectator's perception of the "original" intended use of a piece of footage contrasts with its current use. Vertov's prime intention was to make a film about the "the magic of the medium," as the work is a reflection about the medium itself. Vertov's manifest declarations about the film medium and his resulting cinematic vision imply a new filmic language that redefines both the technical use *and* the conventions of depicting reality: *Life Caught Unawares* (a dedication to an unmediated recording of reality) and the *Kino-eye* (an equally emphatic commitment to presenting the world through the enhanced vision of machines)" (Feldman 2010). These two aspects comprised a radically di□erent media expression: a new filmic language that redefines both the technical use *and* the conventions of depicting reality, and an immediate understanding of the documentary as genre. These algorithmic presentations of the documentary content from the user-generated database prove that "in this way, the Internet has also made it possible for Bard to do something Vertov found quite di□cult: to step back and let the process itself manufacture the work in question. Weir's computer software, in the best constructivist sense, identifies the making of the work as the work. Bard is left as something like the same position as Vertov when, in the opening credits of *The Man With the Movie Camera*, he identifies himself as the "author-supervisor" of the experiment" (Feldman 2010).

The Algorithmic Process

Other similar projects which integrate a movie on a website and invite users to participate and remake in a way or other the narrative of a movie using specific algorithms in a built in software are *Psycho Studio* (1999) by Brendan Dawes which is a little app programmed in Flash 4 which allows internet users to edit the shower scene from Hitchcock's classic film *Psycho* and to save it into a gallery. Similarly *201:A Space Algorithm* (2001) is an online interactive software

program that allows users to re-edit Stanley Kubrick's film *2001: A Space Odyssey*. The re-edited versions compress or expand the film's running time and synthetically generate juxtapositions between images. The user and the computer collaborate to select and sequence shots. All these manipulations are characteristic of non-linear narrative, including the use of looping, real-time temporality, simultaneity, multiplicity, and persistence; and create what Henry Jenkins terms as "micronarratives". *The Infinite Trailer* (2014) is a never ending action drumroll, powered by a program which automatically creates clips looping randomly and forever from trailers by detecting the fade-to-black transitions. *Algorithmic search for love* (Julian Palacz, 2010) unfurls new possibilities for fragmented narratives enabled by a new type of search engine where viewers enter text to search in all video sequences extracted from films in which those words are uttered. By broadcasting them end to end in real time on the screen, a new audiovisual story emerges for the viewer. When analyzing similar works in his *Aporias of the Digital Avant-Garde*, Steve F. Anderson writes: "this deployment of an explicitly algorithmic process also exemplifies one aspect of art production in the database age by emphasizing the importance of keywords as a means of understanding and reprocessing the content of media broadcasts. The attribution of metadata, such as keywords, to any media set constitutes a similar process—the distillation of key concepts from a field of possibilities. The result, as with the information-handling capacity of a database system, is to amplify the power of recombination and use of the data set" (Anderson 2007, 9).

With computers we can create nonlinear narrations: "stories that allow seeing more clearly, narrations that enable us to see variety of relevant patterns and sense the connectedness of the things around". This is the concept of the Korsakow Institute, a Berlin based company established by Florian Thalhofer who in 2000 created Korsakow, an open-source application for nonlinear, interactive narratives. The Korsakow System is an easy-to-use computer program for the creation of database narratives. The viewer has influence over the K-Film. Florian defines the smallest narrative unit as Snu, which has POC's (points of contact). There are in-POC's and out-POC's and all are inter-connected. They are rule-based—the author decides on the rules by which the scenes relate to each other, but s/he does not create fixed paths. K-Films are generative—the order of the scenes is calculated while viewing.

Digital Fandom

The availability of the star's image o□ers itself for recontextualizations and the interrogation of the status of fandom in the digital age: actors disappear, are redrawn, multiplied or isolated from their background. Radical Software Group's (RSG) RSG-Black-1 (Black Hawk Down) is an

algorithmic reediting of Ridley Scott's *Black Hawk Down* (2001), a Hollywood blockbuster portrayal of a 1993 US raid in Somalia. In the RSG version, all the white characters have been algorithmically edited out. Martin Arnold's *Deanimated* transforms the original movie *The Invisible Ghost* into a study of the increasing disintegration of actor movies, leaving the cinematic space to become the actual leading actor in a precise and absurdly comical new interpretation. Kota Ezawa's[2] video *LYAM 3D* is based on the classic 1961 French film *Last Year at Marienbad* by Alain Resnais. Through redrawing and animating the scenes the artist removes most of the baroque details in the film, highlighting the movement of the camera and the statuesque poses of the actors in their static environment. The addition of anaglyphic 3D (red, cyan) adds depth to the flattened quality of Ezawa's animation, entirely transforming the original film. In the works *Him* and *Her*, Candice Breitz creates stuttering kaleidoscopes of Jack Nicholson and Meryl Streep by combining clips from various roles the actors have played throughout their careers while in her *Mother and Father* she explores the gendered parental roles from various Hollywood films. In *Him* she makes use of twenty-three Jacks from forty years; and *Her* brings us twenty-eight Meryls from thirty years. In all the mentioned works, Breitz blacks out the background behind the figures, severing them as much as possible from the mise-en-scène of the source film. Gregg Biermann embraces digital technology's capacity "to alter, mask, fragment, super-impose, mutate, and reframe the actors play"[3]. In his work called *The sweet algorithm* he is repurposing *La dolce Vita*'s (Federico Fellini, 1960) classic Trevi Fountain film scene by making Anita Ekberg and Marcello Mastroianni to appear as digital multiples in a pulsating, never-ending loop.

All of the artists mentioned above are trying to tap our shared cultural memory of cinema, a collective system—according to Røssaak it is a notion of the moving image as a procedural system which is governed by algorithms and is attuned to the nervous system of a collective memory. The experience of computer-generated image processing opens up the potential for a new experience of the film as infinite resource for the new media image itself. Moreover, the new technicity of the image exposes time as a non-human nervous system or a becoming, in other words, as Rodowick puts it, the loss of a certain "feeling" of "human" time.

[2] *Kota Ezawa is a Japanese-German artist currently based in San Francisco. Ezawa meticulously recreates, frame-by-frame, animated sequences from television, cinema and art history using basic digital drawing and animation software.*

[3] *From artist's statement, http://www.criticalcommons.org/Members/vaparedes/commentaries/the-hills-are-alive-commentary*

PART 2

DATA: Cultural Analytics

By 2004, all the films that constitute cinema became "digital intermediates" (Paredes, n.d.) available on the Internet. The massive digitization of movies also reflects today's cultural practice of finding innovative ways of using already accumulated media. Manovich writes:

"Modernism-approximately from the 1860s to the 1960s, (or from Manet to Warhol; or from Baudelaire to McLuhan), including the avant-garde of the 1920s—corresponds to this period of media accumulation. The artists are concerned with representing the outside world; with *seeing* it in as many di□erent ways as possible" (Manovich 2002, 9). Once that experimentation led to a tremendous accumulation of media records, society became concerned with the processing of data—Manovich calls this new stage in media history meta-society: "It becomes more important to find e□ective and e□cient ways to deal with already accumulated volumes of media than to record more or in new ways. As had become apparent by the early 1980s, culture no longer tries to "make it new". Rather, there is endless recycling and quoting of past media content, artistic styles and forms, which has become the new "international style" of a media-saturated society. In short, culture is now busy re-working, recombining and analyzing the media material already accumulated."

Lev Manovich writes about this explosive growth of newly available cultural content on the web, and calls this paradigm of researching massive amounts of information on cultural artifacts, dynamics and flows Cultural Analytics: all Cultural Analytics are computer-based quantitative analysis and interactive visualization of large data sets and data flows. They employ statistical data analysis, data mining, information visualization, scientific visualization, visual analytics, simulation and other computer-based techniques as we have seen in all of the examples mentioned above where artists and researchers have started systematically applying these techniques to the analysis of the contemporary cultural data of thousands of movies.

Statistical analysis

In this context many projects which focus on the statistical analysis of quantifiable data descriptive of the structure of film: *Cinema Redux* (2004) by Brendan Dawes distills a whole film down to a single image. Snapshots are taken from a movie at one second intervals and stitched together as 8×6 pixel frames into a single image while Frederic Brodbeck's *Cinemetrics* (2011) extracts information such as the editing structure, color, speech or motion and transforms it into graphic representations creating a visual "*fingerprint*" for them. Then *CineMetrics* (2011) by Yuri Tsivian, Gunars Civjans, makes it possible to take shot lengths in real viewing time.

Other software compresses the film frames achieving a colorful print of the movie: *Western roundup* (2013) or *Movie bar code* (2013) by Kevin L. Ferguson are two examples where the movies become closely related to painting as the whole movie is reduced to a static colorful image. *Cory Arcangel's Colors* (2009) used a slit scan technique to sample a horizontal row of colors from a single frame of Dennis Hopper's *Colors* (1998) and extend them vertically to form a

video of undulating vertical lines. The source film's audio plays in real time, but the image track must repeat some thirty-three days in order to display the "entire" film. While the source material is skeletally preserved by maintaining the integrity of the soundtrack, the representational function of the visual field has been eclipsed by a play of color.

In Jason Salavon's *Top Grossing Film Series* (2000) the average colors in the 336,247 frames of *Titanic* (1997) are arranged conforming to the original sequence of the narrative in straight horizontal lines beginning at the upper left and moving to the lower right; while in his *Emblem* series uses *2001: A Space Odyssey* (1968) by Stanley Kubrick, *Taxi Driver* (1976) by Martin Scorsese, and *Apocalypse Now* (1979) by Francis Ford Coppola, and reduces each film to its average color and is reorganized in outwardly flowing concentric rings in accordance with the order of the narrative.

Angela Bulloch's *Z Point* (2002), which translates the closing sequence of Michelangelo Antonioni's *Zabriskie Point* (1970) into a bank of forty-eight "pixel boxes", six high and eight wide to mimic the aspect ratio of 35mm film. Each box is a fifty-centimeter glass-fronted square containing within it three fluorescent tubes. Using custom software, Bulloch's pixel boxes can produce up to sixteen million colors, as many as is possible on a computer screen. *Z Point* samples one frame from each second of the excerpt (since the pixel boxes are limited to one change per second) and translates it into an array of forty-eight large pixels, one for each box. Color and movement are retained while the representational powers of the image are obliterated. The result is a pulsing grid that brings together a sense of bodily rhythm with geometric rigor. Here remaking involves subjecting a preexisting film to a cross-medium process of translation: using software to create a new media artifact.

Visualization

As the Net Gen is more comfortable in image-rich environments than with text (Oblinger & Oblinger 2005), designers and computer scientists are using data to help us understand more about ourselves and our surroundings, mainly through visualization. *Culturegraphy (2014)* developed by Kim Albrecht reveals complex relationships of over one hundred years of movie references. The color gradients from blue to red that originate in the 1980s denote the era of postmodern cinema, the era in which movies tend to adapt and combine references from other movies. *NetFlix Similarity Map visualization* (2009) created by Christopher Hefele depicts the similarities between 5,000 movies, as found by an algorithm used for the Netflix Prize. Movies are represented by dots with adjacent titles. *Movie Galaxies* (Kaminski & Schober 2011) provides a novel way of visualizing the narrative structure of the movie through its characters' social network. *Graph Alchemist* (2014) is a site that lets one easily visualize networks of

movies, actors, and directors. Orange circles are films, blue are people. *Patterns in Oscars movies* (2007) by Wesley Grubbs and Nick Yahnke demonstrate the relationship between Oscar-winning Directors to Oscar-winning actors.

After *Psycho*, Brendan Dawes created "a tool" to explore the director's movies: *Hitchcock Filmography (2002)* creates a timeline of Alfred Hitchcock's movies using birds on a telegraph wire as a metaphor. Decades and key actors can be filtered, making the irrelevant birds fly away, whilst scrubbing the date marks reveal the dates being pecked into the canvas. *In Cinematic Particles* (2007) by Eva Schindling subtitles and spoken dialog produce visualizations that consist mostly of black ink blobs that grow together. As the particles are constantly reset with new parameters movies that show long silent pauses between scenes gives particles more time to produce long lines and curves. By altering the replay speed of the movie, size and dynamic of the emerging drawings can be controlled.

Manovich explores how "media visualization" techniques can help us see films in new ways, supplementing already well-developed methods and tools in film and media studies: "one of the goals is to make a bridge between the two fields which at present are not connected: the field of digital humanities which is interested in new data visualization techniques, but does not study cinema, and quantitative film studies research which until now has used graphs in a more limited way". He traces visualizations for the study and design of media to many artist and filmmakers who created diagrams of their projects before or after they were realized. Vertov, in particular, created many diagrams to work out production, content structures and editing in his films.

Benjamin Grosser shows what a computational system sees when it watches the same films that we do. *Computers Watching Movies (2013)* shows what a computational system sees when it watches the same films that we do. The work illustrates this vision as a series of temporal sketches, where the sketching process is presented in synchronized time with the audio from the original clip. Viewers are provoked to ask how computer vision di□ers from their own human vision, and what that di□erence reveals about our culturally-developed ways of looking. Why do we watch what we watch when we watch it? Will a system without our sense of narrative or historical patterns of vision watch the same things? *Computers Watching Movies* was computationally produced using software written by the artist. This software uses computer vision algorithms and artificial intelligence routines to give the system some degree of agency, allowing it to decide what it watches and what it does not. Six well-known clips from popular films are used in the work, enabling many viewers to draw upon their own visual memory of a scene when they watch it. The scenes are from the following movies: *2001: A Space Odyssey, American Beauty, Inception, Taxi Driver, The Matrix,* and *Annie Hall.*

3D

Film frame motion analysis (2005) by Martin Hilpoltsteiner includes motion analysis for film sequences by extracting and arranging them behind each other and the sound volume is mapped to a frame's width and height, or the frame frequency is translated as rotation. The frames create a three-dimensional space.

Motion structures (Everardo Reyes-Garcia, 2011) transforms movies from a 2D image sequence to a 3D shape done automatically by custom software. The project researches the artistic possibilities of 3D computer generated forms, and also o□er a novel way to visualize moving image sequences. The outcome of the process is 3D digital objects which can be represented as images and also as 3D printed forms, which the artists call "motion object". Viewing data as object (Brendan Dawes: *Data as Object*, 2014) becomes a standard. The decomposition of narrative films through intense space-time compression, values of instantaneity and simultaneity, creates an emphasis on "real-time" and immediacy of action.

Eduardo Navas (*Remix Analytics*, n.d.) also provides remix analyses such as sliced visualization of videos montage and image plot visualizations proving that movie fragments used creatively by users can also be used as data (*Remix Data, Film analysis*, n.d.).

Manovich writes that computers are revealing interesting patterns at every scale: "from a single shot to billions of videos and can help us notice subtle patterns in editing, composition, movement, and other aspects of cinematography and narrative that maybe hard to see otherwise. Computers can also allow us to compare any number of films, helping us to understand what is typical and what is unique in the given dataset, and identify common characteristics and similar patterns" (Manovich 2013). The interest in this kind of approach is to show how other dimensions of films can also be explored using particular visualization techniques.

Database

In *Found Footage Filmmaking, Film Archiving and New Participatory Platforms* Giovanna Fossati reminds us of two database projects through which EYE Film Institute of the Netherlands made available large amounts of films: *Scene Machine* (2010) is an interactive search engine that makes it possible for the user to associatively combine approximately 1,000 film fragments from the EYE collection. Using two hundred keywords such as "special e□ects," "chase," "innovation," "technique," "audience," the user can combine silent, sound, black and white, and color film fragments from the first half of the twentieth century. The user can intervene at any time while the remix is unfolding on the screen by changing, deleting, and adding new keywords to a□ect the selection of instant found footage films. Thanks to the metadata combined to each fragment available in *Scene Machine*, the film historical contextualization is also warranted. This online machine was also adapted to become an interactive installation that

was first exhibited in the Amsterdam City Archive during the 24th International Documentary Film Festival Amsterdam in November 2010. The same kind of instant found footage filmmaking was made possible for the users, who could compile film fragments by placing wooden bricks holding a RFID (radio frequency identification) chip associated with a keyword. This live variation of *Scene Machine* combines online database principles with hands on users' experience, something of a trend in today's transition from analogue to digital technology (Fossati 2011, 134-137).[4]

The other project—*Eye Panorama* (2010) provides a three hundred sixty degree immersion in moving images from the EYE collection enabling di□erent forms of interaction when entering the enclosed space of the installation. At first the visitors are overwhelmed by an abundance of moving images from the first one hundred twenty years of film history. As the visitors get accustomed to the space they can approach one of the seven consoles through which they can control di□erent sections of the wall projections by zooming in to reveal a compilation of fragments that are sorted by themes. For instance, the theme "Netherlands" will reveal twelve to sixteen shots of bicycles from di□erent films made in di□erent times with di□erent techniques, colors, and sounds. The theme "slapstick" will reveal shots of comedians trashing everything around them, and the theme "film stars" will reveal close ups of well-known and long-forgotten actors and actresses. Through the consoles the visitors can select one particular fragment and explore it by navigating back and forth. Also contextual film historical information about the films can be found via the navigation consoles. Di□erent from online (websites) or mobile applications (iPads and smart phones), an immersive installation such as the EYE Panorama o□ers a communal experience that is typical of a cinema or museum experience. Still, it adds an element of interaction to it, and provides the visitors with a number of tools to participate in curating the content of his/her own and others' (film) experience. "Thus, computer-based techniques of media access, manipulation and analysis are the new avant-garde. The new media avant-garde is about new ways of accessing and manipulating information. Its techniques are hypermedia, databases, search engines, data mining, image processing, visualization, simulation. The new avant-garde is no longer concerned with seeing or representing the world in new ways but rather with accessing and using previously accumulated media in new ways. In this respect new media is post-media or meta-media, as it uses old media as its primary material" (Manovich 2002, 8).

Manovich characterizes this will to access and control this world from behind interactive screens as a "database complex"—the irrational desire to preserve and store everything on computers. According to Rodowick, "in a world defined by the heady accumulation of information, the will defines the desire of the new ontology. The electronic screen sustains us in an expansive present, synthetic or digital expressions always have an air of science fiction about them. They anticipate a future world that has already emerged in the present" (Rodowick 2007, 133).

[4] *Refer to the concept of "convergence/divergence" as discussed in Fossati (2011, 134-137)*

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