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Media Aesthetics, Simulation, and the “New Media”

No discussion of media aesthetics can avoid mention of so-called digital media. The term “media aesthetics” was coined more or less at the same time as the spread of the “new media,” which took place from the early 1990s onward—the Internet became increasingly widespread from around 1994. Initial research in the popular online metacatalogue *Karlsruher Virtueller Katalog* reveals (with one exception¹) that only the titles of books published after 1992 contain the term “media aesthetics.” My hypothesis is that there is indeed a connection between the discourse of media aesthetics and the spread of digital media. Computer simulation played an explicit and significant role in the debate on media aesthetics during the first half of the 1990s. In Part 1 below, I will reconstruct this debate, differentiating between two distinct traits of media aesthetics—neither of which provides a truly satisfactory answer to the challenge of digital media, however. Part 2 will provide a more detailed account of what computer simulation actually is—and what it has to do with media aesthetics. Pixar’s 2001 film *Monsters, Inc.* will be used as an example. Part 3 will apply the insights gained in Part 2 more generally. Part 4 presents an outlook.

1. The Discourse of the 1990s: Simulation and Two Types of Media Aesthetics

Wolfgang Iser wrote in 1993: “There can be no doubt that we are currently experiencing an aesthetic boom.”² In the same year, he edited a volume titled *Die Aktualität des Ästhetischen (The Currency of the Aesthetic)*.³ At the same time, Martin Seel also noted a “current...aesthetics euphoria.”⁴ Only two years previously, a book had been published that to

¹ See Werner Faulstich, *Medienästhetik und Mediengeschichte mit einer Fallstudie zu ‘The War of the Worlds’ von H. G. Wells* (Heidelberg: Winter, 1982). Exceptions prove the rule.

² Wolfgang Iser, “Ästhetisierungsprozesse. Phänomene, Unterscheidungen, Perspektiven,” *Deutsche Zeitschrift für Philosophie* 41, no. 1 (1993): 7.

³ Wolfgang Iser, ed., *Die Aktualität des Ästhetischen* (Munich: Fink, 1993).

⁴ Martin Seel, “Zur ästhetischen Praxis der Kunst,” *Deutsche Zeitschrift für Philosophie* 41, no. 1 (1993): 32 (footnote).

this day is regarded as a classic of the debate on the frequently invoked “new media”: *Digitaler Schein. Ästhetik der elektronischen Medien* (*Digital Semblance: Aesthetics of the Electronic Media*), edited by Florian Rötzer.⁵ “Aesthetics of the electronic media,” that is, media aesthetics, already appears in the title. Welsch takes the same line as most of the contributions to this volume in attributing the “aesthetics boom” not *only*, but *mainly*, to the rise of the computer, or more precisely to computer simulation, which at this time was occasionally somewhat inaccurately referred to as *virtual reality*:

Simulation—an aesthetic process that takes place on the monitor screen—no longer has an imitative function, but now takes on a productive one. [...] Daily interaction with microelectronic forms of production leads [...] to an aestheticization of both our consciousness and our entire perception of reality. Those who work with CAD on a daily basis [...] have experienced how little real reality is, to which extent it can be aesthetically modeled.⁶

At this point we may already ask ourselves why the fact that reality can be modeled should stand in contradiction to its realness. The modeling of the real, for example in scientific simulations,⁷ and its alignment with a more or less suitable (i.e., experimental) observation, is actually able to substantiate reality. Besides, an artificially constructed object, such as a chair, be it ever so *aesthetically modeled*, is still real. The strange dichotomy between aesthetic design and reality already touched upon in this quote is symptomatic of the discourse of the early 1990s, in which simulation’s potential to design and shape appeared to be canceling out reality—a development that probably goes back to the broad reception of Jean Baudrillard’s use of the term “simulation” in the 1980s.⁸ Simulation seemed to show tellingly that the traditional opposition of appearance and reality in epistemology and aesthetics had itself

⁵ Florian Rötzer, ed., *Digitaler Schein. Ästhetik der elektronischen Medien* (Frankfurt am Main: Suhrkamp, 1991).

⁶ Welsch, “Ästhetisierungsprozesse,” 10–11. CAD stands for computer-aided design.

⁷ See, e.g., Peter Galison, *Image and Logic: A Material Culture of Microphysics* (Chicago: University of Chicago Press, 1997), Chapter 8.

⁸ See Jean Baudrillard, *Symbolic Exchange and Death* (London: Sage, 1993). For a criticism of Baudrillard, see Lorenz Engell, *Das Gespenst der Simulation. Ein Beitrag zur Überwindung der ‘Medientheorie’ durch Analyse ihrer Logik und Ästhetik* (Weimar: VDG, 1994).

become obsolete. Against this background, any proof of the creative power of “digital semblance” (Rötzer) is simultaneously seen as proof of a kind of derealization. The positions of the early 1990s emphasize the discontinuity between media aesthetics and earlier aesthetics because the opposite pole of a non-aesthetic “reality” seemed to have ceased to exist. An extremely broad concept of media aesthetics as “aisthetics” was debated—several books were published at this time with titles containing the word “aisthetic” and invoking a “different aesthetics.”⁹ This aisthetics firstly defined the entirety of so-called reality as permeated by simulation and thus as somehow “artificial” and “aesthetic.” Secondly, this led to the conclusion that aisthetics as the analysis of the shaping of perception by media and technology actually preceded any kind of epistemology. As early as 1990, Norbert Bolz used the terms “media-aesthetic” (“*medienästhetisch*”) and “media aesthetics” (“*Medienästhetik*”) in his *Theorie der Neuen Medien (Theory of the New Media)*,¹⁰ proclaiming media aesthetics as a new leading field of study.¹¹

But at the same time, there was also resistance to this idea. In 1993, Martin Seel published an essay titled “Vor dem Schein kommt das Erscheinen” (“Before the Semblance Comes the Appearance”), with a subtitle of particular relevance here, “Bemerkungen zu einer Ästhetik der Medien” (“Some Remarks on a Media Aesthetics”). In particular, he criticized Bolz and several contributions from the volume *Digitaler Schein*. These “apostles of an effusive media aesthetics,”¹² as he wrote in a later text, blurred the difference between perception as pragmatic and functional and an aesthetic, self-driven perception focused upon its own performance. Thus Seel defends the distinction between a non-aesthetic reality and aesthetic occurrences. Seel criticizes—correctly, to my mind—the view of computer simulation as a

⁹ Cf. Karlheinz Barck, Peter Gente, Heide Paris, and Stefan Richter, eds., *Aisthesis. Wahrnehmung heute oder Perspektiven einer anderen Ästhetik* (Leipzig: Reclam, 1990).

¹⁰ See Norbert Bolz, *Theorie der neuen Medien* (Munich: Fink, 1990), 124 and 140 (“Medienästhetik”).

¹¹ See Norbert Bolz, *Eine kurze Geschichte des Scheins* (Munich: Fink, 1991), 7.

¹² Martin Seel, “Ästhetik und Aisthetik. Über einige Besonderheiten ästhetischer Wahrnehmung,” in *Bild und Reflexion. Paradigmen und Perspektiven gegenwärtiger Ästhetik*, ed. Birgit Recki and Lambert Wiesing (Munich: Fink, 1997), 19.

process of global aestheticization¹³ presented by Welsch or Bolz: “Aesthetic components only become a factor when the execution and perception of a simulative representation focuses mainly not on what is simulated, but also or mainly on the *manner of simulation*.”¹⁴ That is, for Seel the manner of representation acts as a catalyst for self-referential perception. In Western tradition, works of art are usually ascribed the ability to stimulate this kind of perception.¹⁵

From this perspective, the term “media aesthetics” suggests a specific use of the medium for the purpose of aesthetic perception. In his text “Vor dem Schein kommt das Erscheinen,” Seel explicitly mentions “self-referential appearance”¹⁶ as a technique used in aesthetic strategies. This refers to the medium of a given representation becoming visible or appearing in the representation—thus Heidegger writes, for example: “To be sure, the painter, too, makes use of pigment; he uses it, however, in such a way that the colors are not used up but begin, rather, for the first time, to shine.”¹⁷ This notion, or a range of variations of it, plays a highly important role in the twentieth century, especially in the aesthetics of high modernism—we need only think of Clement Greenberg’s key conceptualization of modernist painting of around 1945–1960, which recommended making painting’s aspects of surface and color themselves the main subject matter of painting.¹⁸ Consequently, Greenberg demanded

¹³ A skeptical view on this is put forward by Gottfried Boehm, “Die Wiederkehr der Bilder,” in *Was ist ein Bild?*, ed. Gottfried Boehm (Munich: Fink, 1994), 12.

¹⁴ Seel, “Ästhetik,” 25–26.

¹⁵ Stating this is not superfluous, as one can imagine being aware of and perceiving one’s own perception without a specific (artistic) motivation for doing so.

¹⁶ Martin Seel, “Vor dem Schein kommt das Erscheinen. Bemerkungen zu einer Ästhetik der Medien,” *Merkur* 9–10 (1993): 781.

¹⁷ Martin Heidegger, “The Origin of the Work of Art,” in *Off the Beaten Track*, ed. and trans. Julian Young and Kenneth Hayes (Cambridge: Cambridge University Press, 2002), 25.

¹⁸ See Clement Greenberg, “Modernist Painting,” in *Modernism with a Vengeance: Collected Essays and Criticism*, vol. 4 (Chicago: University of Chicago Press, 1993), 86: “It quickly emerged that the unique and proper competence of each art coincided with all that was unique in the nature of its medium.” It was Greenberg’s emphasis on the medium that inspired McLuhan to investigate the theme of media himself; see Boris Groys, *Unter Verdacht. Eine Phänomenologie der Medien* (Munich: Hanser, 2000), 93–101. In this regard, high-modernist aesthetics and its reflexive emphasis on the media represents one source of media theory. Thus it is hardly surprising that similar tropes are to be found in different positions of media theory. See, for example, Friedrich Kittler, “Gleichschaltungen. Über Normen und Standards der elektronischen Kommunikation,” in *Geschichte der Medien*, ed. Manfred Faßler and Wulf Halbach (Munich: Fink, 1998), 261. Dieter Mersch’s negative media theory approach, which focuses in particular on art’s ability to indirectly thematize the otherwise intangible medium, is in the tradition of high-modernist aesthetics.

that painters purge painting of any kind of intermedial contamination, whether plasticity or narrative. For Greenberg, the term “media aesthetics” would have constituted a pleonasm, as in his eyes every artistic aesthetics was based on reflections on the medium. Given this, how did the term “media aesthetics” evolve in the 1990s?

Seel takes the continuity of modernist traditions as his starting point, but then links the term “media aesthetics” explicitly to digital media: “That which we today [1993] refer to in abbreviated form as media aesthetics is thus merely the aesthetics of a *special kind* of artistically employed media—electronic media.”¹⁹ He presents this *special kind* two sentences later: “The first medium of the new media is the possibility of digital storage, their ‘immaterial’ code, which cannot itself be perceived, but instead can be realized in various forms of perceptible effects.”²⁰

The traditional (in a positive sense of the word) idea of connecting the creation or at least facilitation of aesthetic perception to media-reflexive artistic strategies seems convincing—if only to delimit what is defined as aesthetic. However, there is a difficulty in doing so, which Seel himself mentions: the immaterial digital code is not simply another medium that possesses a sensual materiality, such as color, for example. Rather, it is *imperceptible* in and of itself—and thus cannot act as the foundation of a genuine aesthetics (in the sense of perception), as by definition only that which can be perceived can be made reflexively perceptible, that is, be made the subject of aesthetic perception. However, Seel also writes that digital code “can be realized in various forms of perceptible effects.” While this code cannot be exhibited in a self-reflexive, aesthetic manner, its effects obviously can. This would mean, however, that media reflexivity can no longer be understood in modernist terms as the exhibition of the medium that *forms the basis* of a work of art. Viewed in this light, the digital

¹⁹ Seel, “Vor dem Schein,” 772.

²⁰ Ibid. Here Seel equates electronic with digital, which strictly speaking is not entirely correct (as there were and are non-electronic digital codes, such as writing, or electronic analog media, such as tapes, for example).

code is not even a medium, but rather something that transposes the concept of the medium itself,²¹ as demonstrated by the coining of the term “new media,” and thus opens up media aesthetics as a field of discourse. At any rate, the way back to a now traditional media aesthetics of the kind espoused by modernism is closed off—at least if the aim is to describe the “new media” and their aesthetic potential. In summary: firstly, there is a “strong” type of media aesthetics (Welsch, Bolz, and others), which has the advantage of being conscious of historical discontinuity, but the disadvantage of delimiting the concept of aesthetics. Secondly, there is a *weak* kind of media aesthetics (Seel and others), which has the advantage of being conscious both of the independence of aesthetic perception and of continuity. However, its problems are that on the one hand it refers to the transposition of media arising in the wake of the development of digital media and even bases the emergence of media aesthetics on this, but on the other hand ultimately adheres to a traditional, modernist concept of media reflexivity. At this point, I would like to propose a third, medium kind of media aesthetics. My main line of argument will agree with Seel that rendering the aesthetic absolute as the condition of the world is pointless, on the one hand. On the other hand, I do not wish to simply continue with the modernist aesthetics of media reflexivity—for medial self-reflexion under the conditions of digital media takes place via the intermediate stage of the transposed simulation (and sampling, see Part 3 below) of the media that have existed so far, which thus become “new media.” This is how the term “media aesthetics” makes sense: it is concerned with an aesthetics, even aesthetics, of pre-digital media, which become visible (and audible) once more through their transposed digital repetition.

2. Computer Simulation and Transmaterialization

It is no coincidence that such a strong emphasis is placed on computer simulation in the first type of media aesthetics, as it constitutes one of digital computers’ most important fields of

²¹ See Georg Christoph Tholen, *Die Zäsur der Medien. Kulturphilosophische Konturen* (Frankfurt am Main: Suhrkamp, 2002), 8 and 19–42.

application.²² Around 1967, J. C. R. Licklider referred to the development of computer-based simulations as the most significant event for science and technology since the invention of writing.²³ We can adopt Helmut Neunzert's definition: in simulations, an operationally defined "real process...is *represented* as mathematics...so as to be simulated in the computer using algorithms."²⁴ This somewhat tautological phrasing means that, based on *different* kinds of gathered or sampled data, the rules governing or at least regularities in the behavior of an object or process, that is, a *theory*, can be derived. The basic model is translated into a formalized model able to be carried out by a computer.²⁵ This formalized model must then be compared and adapted to the experimental data and validated. To the extent that—to use Deleuze's formulation—the structure is the reality of the virtual, simulation models of objects are virtual objects.²⁶ These virtual objects can be placed in *future* and/or *alternative* conditions. This means that either we allow the model to develop more or less *independently* (guided by theoretical extrapolations), which permits time to be compressed considerably, so as to see what the modeled phenomenon presumably *will be like*, and/or certain parameters are modified, so as to see how the object would behave under different conditions, for example.

After 1945, simulations were used to develop the hydrogen bomb,²⁷ and today are omnipresent in urban planning, architecture, medicine, most natural and even social and economic sciences, as well as in the so-called interactive simulations used to train pilots,

²² See John Raser, *Simulation and Society: An Exploration of Scientific Gaming* (Boston: Allyn and Bacon, 1972). Prior to this, simulations were also carried out using analog computers, which are actually better suited to solving certain problems; see Walter W. Soroka, *Analog Methods in Computation and Simulation* (New York: McGraw-Hill, 1954).

²³ See J. C. R. Licklider, "Interactive Dynamic Modeling," in *Prospects for Simulation and Simulators of Dynamic Systems*, ed. George Shapiro and Milton Rogers (New York/London: Spartan Books, 1967), 289.

²⁴ Helmut Neunzert, "Mathematik und Computersimulation. Modelle, Algorithmen, Bilder," in *Simulation. Computer zwischen Experiment und Theorie*, ed. Valentin Braitenberg and Inga Hosp (Reinbek bei Hamburg: Rowohlt, 1995), 44.

²⁵ On the different forms of computer simulation, see Michael M. Woolfson and G. J. Pert, *An Introduction to Computer Simulation* (Oxford: Oxford University Press, 1999).

²⁶ See Gilles Deleuze, *Difference and Repetition* (London: Continuum, 1994). Thus the virtual is, unlike the fictional, the opposite not of the real but of the actual.

²⁷ See Galison, *Image and Logic*, chapter 8.

high-speed train drivers, and the staffs of nuclear power stations. There can be no question of any disappearance of the real into the simulation, as claimed by Jean Baudrillard in his texts, which were particularly widely read during the 1980s and early 1990s. *Au contraire*: simulation is one of the most powerful means of designing, researching, controlling, and producing things that are very real indeed. But while this is the case, the abovementioned applications are of no relevance to media aesthetics.

It is much more relevant that computer simulation techniques can also be used to simulate other technological media. There are many examples of this—here we will focus upon computer graphics and photorealism, which not by chance made their first spectacular appearances in the early 1990s with movies such as *Terminator 2* and *Jurassic Park*. Photorealism is simulation, as the characteristics (certain traits) of photographic media are measured and the resulting data made the basis of computer models.²⁸ A simulated or “virtual” camera is a real camera, which, depending on the data available, can approximate its material model more and more closely and can be *updated* (if so desired)—of course, the virtual camera, which ultimately is a mathematical construct, can also be changed in whichever way is desired, for example in order to be able to produce pictures for which physically real cameras have no counterpart.²⁹

This virtual camera is now used to virtually take a photograph of a virtual object field, which is lit by a virtual source of light.³⁰ As far as their appearance is concerned,³¹ the pictures generated in this way correspond to the basic characteristics of chemical photography (with the exception of photograms): firstly, the wealth of unintended details. Many generated

²⁸ See Eihachiro Nakamae and Katsumi Tadamura, “Photorealism in Computer Graphics—Past and Present,” *Computer and Graphics* 19, no. 1 (1995): 119–30.

²⁹ Such targeted changes to simulation models of optical media are standard procedure in the simulation of holography, for example, so as to create so-called holographic elements that possess traits that cannot be produced using physical optics. See Hartmut Marwitz et al., *Praxis der Holografie. Grundlagen, Standard- und Spezialverfahren* (Ehningen bei Böblingen: Expert, 1990), 445.

³⁰ See W. J. Mitchell, *The Reconfigured Eye: Visual Truth in the Post-Photographic Era* (Cambridge, MA: MIT Press, 1992), 117–35.

³¹ With the exception of montage and such in film.

graphics are classed as not (photo)realistic enough precisely because they are too “clean”; their surfaces do not have enough scratches, spots, and other similar flaws.³² Secondly, there are the effects created through camera optics.³³ Computer-generated images could follow any other or indeed no projection logic, but if they want to be photorealistic, they will adopt the linear perspective that is traditional in photography and film.³⁴ Thirdly, computer-generated images attempt to model the qualities of the photographic emulsion itself, such as the grainy structure of the image that is visible particularly in blow-ups or films that are highly sensitive to light.³⁵

This graininess brings us to our key point: in traditional media, we conventionally distinguish between the materiality of a medium and the forms generated in or through it. These forms are frequently intermedial in nature, such as narrative structures in literature, comics, films, television,³⁶ and computer games; rhythmic structures in poetry, music, films, and video clips; planimetric structures in painting, photography, or films; the “live” quality of television, radio, and telephone; forms of the visual “look” that photography and film or animated films, comics, and painting can share; and so on. We can refer to such forms as “transmedial intermediality.”³⁷ By contrast, materiality was always seen as something that remains well-nigh invisible “behind” the specific configuration of transmedial forms, that aside from certain formal diffractions only becomes evident in faults or malfunctions, in film tears, crackles, white noise, distortions, motion blurring, or lens flares, for example. Often faults

³² See Martin E. Newell and James F. Blinn, “The Progression of Realism in Computer-Generated Images,” *ACM 77: Proceedings of the Annual Conference* (New York, 1977), 445–46.

³³ On the simulation of cameras and motion blurring, see Michael Potmesil and Indranil Chakravarty, “Synthetic Image Generation with a Lens and Aperture Camera Model,” *ACM Transactions on Graphics* 1, no. 2 (1982): 85–108.

³⁴ See James D. Foley et al., *Computer Graphics: Principles and Practice* (Reading, MA: Addison-Wesley Professional, 1995), 230–37, esp. 231.

³⁵ See Joe Geigel and F. Kenton Musgrave, “A Model for Simulating the Photographic Development Process on Digital Images,” *SIGGRAPH Proceedings* (1997): 135–42.

³⁶ Here we must take into account that traditional media cannot be simply correlated with *analog*. Thus literature, to the extent that it is based on the disjunct and differentiated symbolic pattern (Goodman) of language, is digital; film represents an analog recording as far as individual images are concerned, but its technique of *sampling* movements 24 times a second makes it proto-digital.

³⁷ See Jens Schröter, “Intermedialität. Facetten und Probleme eines aktuellen medienwissenschaftlichen Begriffs,” *montage/av* 7, no. 2 (1998): 136–43.

were used in pre-digital media-based art forms, usually explicitly, so as to emphasize the material specificity of the medium *behind* the form.³⁸ However, we must take into account that this kind of experimental practice of rendering faults visible only was and is possible if the fault is contextualized and thus shown to be intentional. It is thus basically transformed into a non-fault: otherwise, a distorted broadcast of a football game would be aesthetic instead of causing viewers to curse loudly, as is usually the case. In this regard, the fault as an aesthetic technique depends on specific contexts and conditions. When mediality is supposed to disappear in the transmission of content, it just acts as a disturbance. Where mediality is intentionally emphasized so as to create media aesthetics (e.g., in the art system), intentional faults are welcome.

The present article will now discuss such a context in relation to computers. The simulation models of analog media are, depending on how detailed they are and what purpose they serve, able to simulate the faults of the very same media and—most importantly—*transfer these faults from one medial context to another*. Figure 1 shows a still from the computer-generated film *Monsters, Inc.* of 2001.

[[Figure 1 caption]] Still from Monsters, Inc., directed by Pete Docter (USA, 2001).

We can see some lens flares, which are created in lens optics when photographs or films are shot against the sunlight—but this film is completely computer-generated, and of course no material camera was used. A photographic fault seems detached from materiality in this otherwise more painting- or cartoon-like animated film. In *Monsters, Inc.*, as in many other similar films of recent years—we recall *Ants*, *Toy Story*, *Ice Age*, *Finding Nemo*, *The Incredibles*, *Shrek*, *Ratatouille*, and many others—photorealistic techniques are used to create a *new* type of image that falls between the imagery of animation and photography. It is

³⁸ For a current stance of this kind, see Dieter Mersch, *Medientheorien zur Einführung* (Hamburg: Junius, 2006), 225–26.

decisive that the simulation gradually erases the difference in material specificity evident in analog media to the more transmedial forms. I propose calling this process *transmaterialization*; it produces forms that are not only transmedial, but transmaterial. While transmedial forms (such as narrative techniques, for example) cannot be attributed to any medium in particular, transmaterial forms emphatically refer to the respective *specific* materiality (e.g., a lens flare refers to photography or at least to photographic optics) of a medium, *but in a different context*.³⁹ Such forms do not refer self-reflexively to a basic materiality (such as the forms that modernist aesthetics is concerned with), but rather digitally repeat selected and isolated forms of previous media. To speak with Seel and *Monsters, Inc.*: it is not the digital code, which is itself imperceptible, that is shown reflexively, but the digital repetition of one aspect of photography. The lens flare in *Monsters, Inc.* is thus not a reflexive demonstration of photographic materiality, but the reflexive demonstration of digital simulation's ability to transform the materiality of analog media itself into transmaterial forms. This is explicitly thematized in the film.

The film begins with a scene that takes place in a simulator. The film's closing credits show a range of typically filmic elements, image distortions, and bloopers—all phenomena that do not really exist in a computer-generated movie. Thus it is certainly possible to say that the *kind of simulation* and the perception that underlies it themselves become a theme. And what kind of simulation is this? *Monsters, Inc.* as a computer-generated film ironically places itself within the tradition of the photographic film and, more specifically, the Hollywood film.⁴⁰

The ability of digital simulation to repeat and transpose the tradition of the filmic medium is shown reflexively. At the same time, this emphasizes traits that characterize the traditional

³⁹ See Mark B. N. Hansen, "New Media," in *Critical Terms for Media Studies*, ed. W. J. T. Mitchell and Mark B. N. Hansen (Chicago/London: University of Chicago Press, 2010), 178: "the computer marks a certain dissociation of media from technics."

⁴⁰ In terms of their narrative structure, films such as *Monsters, Inc.* seamlessly follow the "Hollywood Mode of Narration," as defined, for example, by David Bordwell in *Narration in the Fiction Film* (Madison, WI: University of Wisconsin Press, 1985). The aforementioned bloopers shown during the end credits mention Hollywood explicitly at one point. See Jens Schröter, "Visuality and Narration in *Monsters, Inc.*," *Film and Media Studies (Acta Universitatis Sapientiae)* 7 (2013): 35–48.

film in terms of image aesthetics, narrative, and the context of its production (the bloopers). In a manner of speaking, the digital repetition of the film once again renders those things visible that had always characterized the (pre-digital) film.⁴¹

3. The New Media and Media Aesthetics

The example of *Monsters, Inc.* shows why the weak media aesthetics sketched above is problematic in regard to the immaterial digital code. The media quoted within the context of traditional aesthetics have a comparatively specific materiality. By contrast, the material with which computers work is an immaterial code—ultimately it is mathematics, which can be used to calculate anything, or at least everything that can be calculated with reasonable effort. Thus computers are machines that are ontologically fixed only to a relatively low degree. They require a process of contextualization⁴² in order to actually “be” anything more specific. In historic terms, computers have only become media to the extent that they transposed and repeated earlier media—this occurred from around the mid-1960s in the USA.⁴³ This process gives rise to the “new media.”⁴⁴ Thus photography is followed by digital photography. The technique of simulation, which is included in early debate on media aesthetics and was discussed above using the example of *Monsters, Inc.*, is only one of several techniques used by computers to approximate the “old media” and change them into “new media.”

Firstly, computers have forms that are already transmedial at their disposal. But secondly, the media technologies approximated and transmateralized through simulation are also available to them. Thirdly, they are able to digitalize the information of other media, that is, sample it. Every contextualization of the computer, including that *as* a medium, leads in turn to

⁴¹ According to Thomas Elsaesser and Malte Hagener, *Film Theory: An Introduction through the Senses* (New York: Routledge, 2010), 181, Pixar’s films “think” cinema within the broader context of digital transformations.

⁴² See Tholen, *Die Zäsur der Medien*, 19–24.

⁴³ See, for example, Michael Noll, “The Digital Computer as a Creative Medium,” *IEEE Spectrum* 4, no. 10 (1967): 89–95.

⁴⁴ In line with this, Friedrich Kittler emphasizes in “Von der optischen Telegraphie zur Photonentechnik,” in *Mehr Licht*, ed. VVS Saarbrücken (Berlin: Merve, 1999), 65, that the “ubiquitous euphemism that speaks of the ‘new media’ in the plural...cannot obscure the fact that there is only one new medium, namely the digital computer.”

sedimentation processes. 1. In order to turn the computer into a medium, it requires material input and output peripherals. The latter are known as displays. 2. As Claude Shannon showed as early as 1938, every software can be turned into hardware as a logical interconnection of gates.⁴⁵ Thus a CD player, for example, like other new media, is merely a computer within a strictly defined context.

[[Figure 2 caption]] *Thomas Ruff, jpeg sak 01, 2005 (original in color)*

Insofar as digital computers are differentiated into a range of new media, artistic strategies need to start from a reflexion of these new media and not from digitalism itself. To use Seel's expression, new media are the perceptible effects of imperceptible digital codes. It is on *this* level that, since the 1990s—perhaps unsurprisingly⁴⁶—modernist aesthetics have been drawn upon.

This is the case in net art, for example, which presupposes the contextualization and sedimentation of the computer-as-a-net. Tilman Baumgärtel refers explicitly to Greenberg, who had firmly rejected this utilization of modernist aesthetics for net art: “Net art—like modernist painting—deals with the specific, native characteristics of its medium.”⁴⁷ Another artist working increasingly with computers also insists: “If I work with a particular medium, then I want to reflect upon this medium in the image itself.”⁴⁸

This artist is Thomas Ruff. Figure 2 shows *jpeg sak 01* of 2005. We can see an image separated into three almost horizontal strips, a curved green strip at the bottom, an irregular gray zone above it, and a light strip on top. Presumably this is a picture of a cloud streaming over a wooded hillside. However, this cannot be discerned exactly, as the gaze “through” the

⁴⁵ See Claude Elwood Shannon, “A Symbolic Analysis of Relay and Switching Circuits,” *Transactions American Institute of Electrical Engineers* 57 (1938): 713–23.

⁴⁶ As the modernist paradigm had already been more or less exhausted in art in the 1960s, see Thierry De Duve, *Kant nach Duchamp* (Munich: Boer, 1993), 133–92.

⁴⁷ Tilman Baumgärtel, *[net.art 2.0] Neue Materialien zur Netzkunst* (Nuremberg: Verlag für moderne Kunst, 2001), 16–17.

⁴⁸ Thomas Ruff, “Suchmaschinen. Ein Interview von Susanne Leeb,” *Texte zur Kunst* 36 (1999): 75.

picture onto the referent is obstructed. Instead, the eye is drawn to a grid structure made up of square elements that covers the entire surface of the image homogeneously and gives the colored strips a mosaic-like structure. As the image's title points out, this grid is nothing other than the artifacts of the JPEG image-compression technique used as standard on the web.⁴⁹ At the same time, these artifacts—with the help of a little image processing by Ruff—have been made into a truly even grid. Thus the grid can be seen as referring to the grid structure that, according to Rosalind Krauss,⁵⁰ is typical of modernist art. Ruff is thus quoting the prototypical self-reflexive art of modernity and its quest for a medium to reflect the medium of this image itself. Once again, the medium is not *the* computer, but digital photography, that is, the transposed repetition of photography—which this time takes place not through simulation as in *Monsters, Inc.*, but through sampling. We might ask at this point: is the reflection on JPEG not a reflection on the underlying medium of the digital code?

The answer is no, because JPEG is only relevant for coding color images. Thus the contextualization of the use of computers to transfer and process images must have already taken place. With this in mind, it is significant that JPEG is the abbreviation of Joint Photographic Experts Group—photography, the digital repetition of which we are concerned with here, is thus already contained in the name of the group of developers.

Ruff is dealing with photography, and more specifically with digitalized photography that has to be compressed in order to be circulated online and appears in a relatively small format on computer screens and thus appears flawless. Ruff's extreme enlarging of the image thus reveals the materiality of the presentation of a photographic image on a display; it self-referentially presents the condition of its appearance as intended for viewing within the

⁴⁹ On the JPEG format, see Tilo Strutz, *Bilddatenkompression. Grundlagen, Kodierung, Wavelets, JPEG, MPEG, H.264* (Wiesbaden: Vieweg + Teubner, 2009), chapter 9. I would like to thank Axel Volmar for our stimulating discussions and for his important suggestions on the topic of JPEGs.

⁵⁰ See Rosalind Krauss, "Raster," *Die Originalität der Avantgarde und andere Mythen der Moderne* (Amsterdam: Verlag der Kunst, 2000), 51–66. See also Jens Schröter, "Digitally Re-Inventing the Medium. Ein Versuch zum Computer als künstlerischem Werkzeug in den Arbeiten Jörg Sasses," in *Medieninnovationen und Medienkonzepte 1950/2000*, ed. Nicola Glaubitz and Andreas Käuser (Marburg: Schüren, 2006), 119–41.

context of the computer, which is itself contextualized as an image medium. When you next view images online, you will perhaps not see the JPEG artifacts *only* as a disruption—indeed, perhaps you will become consciously aware of them as forms for the first time. And this form can then be connected to other forms: is the image in its grid form not reminiscent of the tendency toward abstraction in pointillism?⁵¹ Who knows. At any rate, we might be encouraged to become aware of and perceive our own perception as it takes place—and this process of perception is also a historic one. For the digital repetition of old media as “new media” also heightens our awareness of the media aesthetics of analog media, such as the graininess of analog photography as opposed to JPEG artifacts, which has been used repeatedly as a conscious stylistic device.⁵² In other words, the spread of the “new media” in the 1990s shifts our attention to analog media once again, as media aesthetics. Thus the controversial discussion of this term—and the emergence from the 1990s onward of subsequent questions, such as the ways in which this media aesthetics (or aesthetics) always shaped perception or even reality—is far from coincidental.

4. Outlook

The question of how this situation has continued to develop remains. We can ask at least two fundamental questions: a) whether the reference of new media to old media is, as has already been seen several times over the course of media history, a transitory phase that lasts only until *genuine* aesthetic forms of digital media finally develop; and b), whether the spread of digital new media is fundamentally changing what *perception* is—and whether the whole question of media aesthetics thus needs to take a completely different starting point.

⁵¹ On the relationship between pointillist design strategies and technological image techniques, see, for example, Norma Broude, “New Light on Seurat’s ‘Dot’: Its Relation to Photo-Mechanical Color Printing in France in the 1880s,” in *Seurat in Perspective*, ed. Norma Broude (Englewood Cliffs, NJ: Prentice Hall, 1978), 163–75.

⁵² See Barbara Flückiger, “Zur Konjunktur der analogen Störung im digitalen Bild,” in *Analog/Digital - Opposition oder Kontinuum? Zur Theorie und Geschichte einer Unterscheidung*, ed. Jens Schröter and Alexander Böhnke (Bielefeld: Transcript, 2004), 407–28.

a) Parisi and Portanova write: “Numbers do not have to produce something, and do not need to be transduced into colours and sounds, in order to be considered as aesthetic objects.”⁵³

They are also more or less following the modernist impulse:

What is left behind here is the very possibility for digital algorithms *to be seen as what they primarily are*, i.e. mechanisms for the processing and calculation of quantities of data, rather than instruments for the production of qualities/effects. It is mainly to this quantifying capacity that we ascribe the aesthetic value of software, a value that we want to associate not to sensorial perception but to something that we define as ‘thought’.⁵⁴

Accordingly, we are here, too, dealing with a media-reflexive gesture, but this gesture is not to take place via the detour of perceptible forms such as image or sound (sensorial perception); instead, the aesthetics of the numerical, quantifiable nature of the digital itself is supposed to become reflexive as a “soft thought” (we cannot say “appear,” as that would again imply sensorial perception). We might point to the statements of mathematicians as an illuminating example. They refer to certain mathematical proofs as “beautiful” or “elegant,” although these proofs do not necessarily correspond to anything perceptible.⁵⁵ However, Parisi and Portanova do not take this possible line of argumentation. Instead, they refer to media-based works of art. In regard to these works, quantification is always the quantification of something: “a dance step, a graphic 3D form, a piece of furniture”⁵⁶—the authors illustrate their article with images of artistic artifacts (objects, dance). Ultimately this corresponds to the theory proposed here, which does not claim that the digital “new media” are exactly the same as the “old media,” but only that they access—besides forms that are transmedial anyway—old media in a partial and approximate manner as transmedial forms, place these in new contexts (for example, interactive contexts), and thus render them visible, audible, and so

⁵³ Luciana Parisi and Stamatia Portanova, “Soft Thought (in Architecture and Choreography),” *Computational Culture: A Journal of Software Studies*, available from: <http://computationalculture.net/article/soft-thought>, last accessed December 20, 2012.

⁵⁴ Ibid., emphasis mine.

⁵⁵ See Gian-Carlo Rota, “The Phenomenology of Mathematical Beauty,” *Synthese* 111 (1997): 171–82.

⁵⁶ Parisi and Portanova, “Soft Thought.”

on *as forms*. Parisi and Portanova also have to refer back to perception: “new ways...to *perceive* the dance.”⁵⁷ A media aesthetics that is not based on sensorial perception is a *contradictio in adjecto*. In this respect, the digital code always needs to update itself in images, sounds, and so on, so as to remain (aesthetically) observable.

b) A different question, however, is that of to whom the sensorial perception can be attributed. It is here in particular that the emergence of interactive media seems to imply a change. The concept developed by Seel of aesthetic perception as self-referential perception takes the human subject as its starting point. But what if the new media themselves began to perceive? Would there then be a media aesthetics in the sense of the aisthesis of the media themselves? And what would that mean? Hansen notes that the “technical perfection of current mobile media and ubiquitous computer devices have sparked a tremendous expansion of sensibility.”⁵⁸ This refers to the “technical capacity to feel introduced by our ‘smart’ devices and technologies.”⁵⁹ Smartphones and the like are constantly collecting data, attempting to analyze our behavior, and observing both us and our surroundings.

From this point of view, human aisthesis (perception) is embedded in a larger aisthetic field (sensation). And accordingly the question of media aesthetics would need to be reformulated: “This elementary dimension of the technical mediation of sensibility represents a difficult and unparalleled challenge for the media theorist: how can he estimate the effects of media on sensibility if this effect takes place *within* the environment that encompasses the sensibility of

⁵⁷ Ibid., emphasis mine. The authors give an example from the website Synchronous Objects for One Flat Thing, Reproduced by the William Forsythe Dance Company (<http://synchronousobjects.osu.edu/>, last accessed December 20, 2012): “This and many other abstract diagrams of dance information (about the cues, but also about the alignments, the directionalities of corresponding flows, the analogous shapes of body movements, the related timings) were translated into algorithms. On their turn, these algorithms were used to determine results and effects in other performative modalities (such as the modeling and milling of fabricated architectural objects by a machine instructed to ‘follow the shape’ of a particular motion).” Information on the dance is used, for example, to produce objects that are supposed to follow the “shape of a movement”: objects that are to be perceived in turn. We are dealing with the visualization of dance—visual perception is addressed explicitly.

⁵⁸ Mark B. N. Hansen, “Medien des 21. Jahrhunderts, technisches Empfinden und unsere originäre Umweltbedingung,” in *Die technologische Bedingung. Beiträge zur Beschreibung der technischen Welt*, ed. Erich Hörl (Frankfurt am Main: Suhrkamp, 2011), 372.

⁵⁹ Ibid.

human and world alike, and furthermore predominantly occurs on scales that cannot be measured for macroscopic and perceptive sensation?”⁶⁰ From this follows a statement of immediate relevance for media aesthetics: “Even a very strongly linked relationship of perception between a *mindbody* and a media object—such as a human being watching a television program—is the product of a primordial and varied, multiscalar and composite cosmo-logic of sensation.”⁶¹ We might say, ironically, that Seel is sitting in front of this television and is watching *Monsters, Inc.* Hansen’s important reflections give rise to questions concerning media aesthetics. Firstly, we should note that he is arguing on a *general* level concerned with how “media and subjectivity are to be thought.”⁶² It remains unclear how we can move from this level to one on which *concrete* examples of perception can be analyzed—“media [...] as the ‘object’ of perceptions.”⁶³ What changes in the description of, for example, the formal and aesthetic offer available on television when what can be seen and heard is embedded within a “primordial and varied, multiscalar and composite cosmo-logic of sensation”⁶⁴? Secondly, this is linked to the fact that Hansen’s argument, in shifting the emphasis of the issue toward general changes in sensation, is similar to precisely those general lines of argument put forward by Welsch and Bolz and criticized by Seel. Even more: Hansen notes (along with Whitehead): “We may question the distinction between the efficacy of the sensory...and the recognition or reflexive experience of *precisely this efficacy*—a recognition or experience that applies when for example we perceive that we see with our eyes or touch with our hands.”⁶⁵ Here Hansen appears to be abandoning the difference between functional and aesthetic (self-referential) perception that Seel had advocated so strongly. This gives us two options: either all (human and/or non-human) perceptions are

⁶⁰ Ibid., 373. The mention of “scales” refers to the fact that most digital media processes are much too “small” and too “fast” to be perceived by human beings.

⁶¹ Ibid., 374.

⁶² Ibid., 368.

⁶³ Ibid., 391.

⁶⁴ Ibid., 374.

⁶⁵ Ibid., 392.

reflexive, or they are not. In the first case, every perception would be aesthetic in Seel's sense of the word,⁶⁶ and a special term such as "media aesthetics" would be redundant. If it is used nonetheless, it is expanded to such an extent that it no longer has any discriminatory power, as with Welsch and Bolz. In the second case, no perception would be aesthetic—and the term would again be irrelevant.⁶⁷ Thus we are forced to adhere to Seel's argument in favor of a distinction between functional and aesthetic types of perceptions. This distinction does not show conclusively whether aesthetic perception needs to be stimulated by media-reflexive artistic artifacts (as modernist discourse up to Seel suggests) or is a perceptive option that—perhaps trained by artistic artifacts—can basically be chosen and applied to any object (as Duchamp's ready-mades seem to imply).⁶⁸ The difference between functional and aesthetic types of perception remains, however, even and precisely in the age of ubiquitous computing, RFID, and omnipresent smartphones. The "*atmospheric* effect of today's media on experience"⁶⁹ does not alter the fact that there are different (e.g., functional vs. aesthetic) forms of experience or perception. Any concept of "media aesthetics" must take this into account.

⁶⁶ This also raises the question of how we are to prove that media technologies—which Hansen explicitly refers to as sentient—are additionally reflexively able to sense that they can sense.

⁶⁷ In his text, Hansen never mentions the terms "aesthetics" or "media aesthetics."

⁶⁸ These two options can be referred to as the specific and the generic in line with De Duve, *Kant nach Duchamp*, Part II.

⁶⁹ Hansen, "Medien des 21. Jahrhunderts," 390. Here, (human) perception is equated with experience; on this, see also 369; emphasis mine.