Artificial Intelligence and the Democratization of Art

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I want to be a machine
Andy Warhol

I. Introduction

The current hype on Artificial Intelligence is exaggerated insofar, as the much-discussed procedures of machine learning adress relatively specialized problems, e.g. of image recognition or more generally of pattern discrimination. A universal, general artificial intelligence is not the goal and perhaps not even possible. Nevertheless, there is one related phenomenon that emerges in sometimes nervous discussions nowadays: It is the question whether the systems of machine learning can be 'creative'. This discussion heated up as Alpha Go was able to beat Lee Sedol in Go—especially the famous move 37 in match two on the 10th of march 2016, which seemed radically new even for experienced Go-Players was discussed: No one foresaw this move—so could it be considered as creative or not?[1] For obvious reasons, this essay cannot go into the depths of the theory of creativity or 'creative subjectivity'[2], but it will adress a recent phenomenon in the discourse on the 'new' AI, a phenomenon, in which the question of creativity is especially urgent: that is the field of art, art created by AI.

1 See the fundamental critique of the idea of machine creativity by Mersch (2019).

2 Cp. amongst many others Sternberg (1999) and Reckwitz (2012).

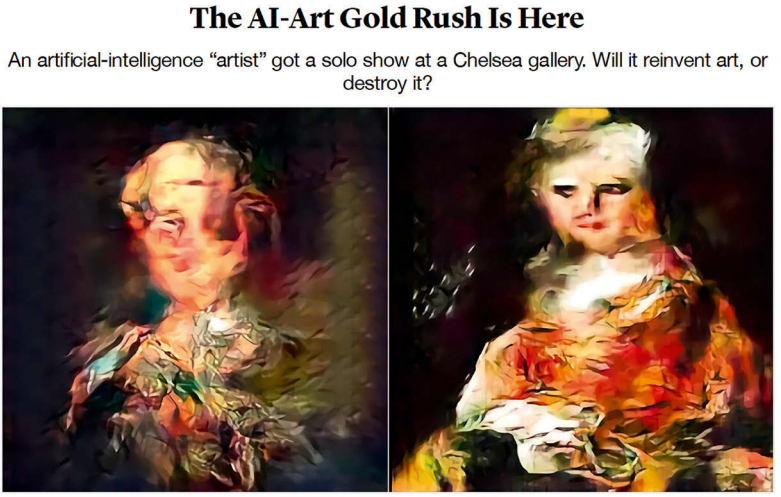

Fig. 1: AI Art Goldrush is here

The AI Art Gold Rush is here is the title of a critical essay by Ian Bogost (2019). The images depicted somehow look like deformed Renaissace portraits, perhaps with a little Francis Bacon in it (Fig. 1).

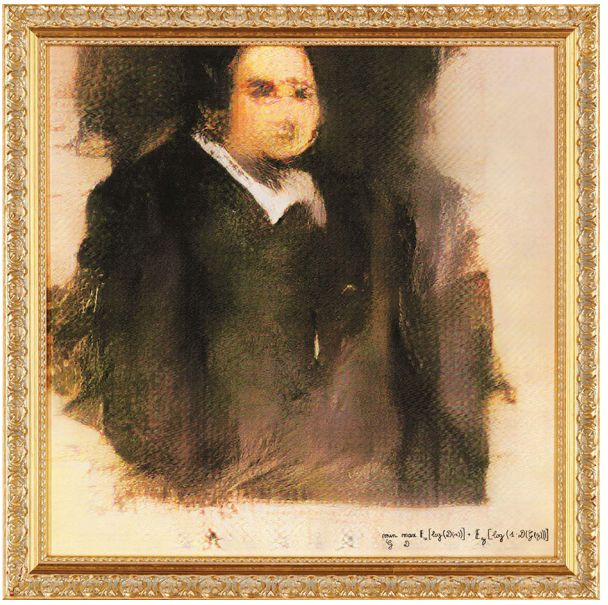

Fig. 2: Portrait of Edmond de Belamy

Especially the slightly fuzzy character of the portraits resembles the famous *Portrait of Edmond de Belamy*, auctioned for 432.500 $ at Christie's in october 2018. That this computergenerated image was sold for a comparatively high price was surprising, the joke with an algorithm as the signature spurred again a discussion on the 'creativity' of AI and the question emerged if an AI system can be an artist or an author. In addition, a discussion began whether the art collective *Obvious* who used the AI system is the 'real' author or even the programmer who developed some of the algorithms.[3] But the artwork was surprising also in another respect: It took recourse to a quite conservative genre and a quite conservative style of depiction: the blurriness seemed not only to evoke a certain 'technicity', but a conservative notion of artiness[4]—see the somewhat weird discussions on the 'blurred' style of the impressionists (cf. Payne 2007). Given that the development of painting in the twentieth century developed new forms like abstraction raises the question why one needs a conservative style of painting in order to demonstrate the creativity of AI?

And even the joke with the signature shows a certain traditional understanding of art, insofar as many artists (see the famous quote of Andy Warhol above) problematized the traditional myth of the artist: just think of surrealistic automatic writing, Cage's aleatoric processes or the doubling gestures of Elaine Sturtevant to name just a few. Perhaps *Obvious* understood the painting as purely ironical—and intended to ridicule the the 'newness' of AI by the very act of foregrounding its conservative 'taste'. Often the 'democratization' of new technologies need the adaption of conservative and established forms to be adaptable to mass markets. Therefore, an abstract work of art might be regarded as insufficient to prove AI's creativity, for the simple reason that many people still have problems in accepting abstract art forms as art at all—or as 'too easy' for real art.

Hence and this is the central argument of my short essay it is crucial to historicize this discussion on 'AI art', the implications of 'machine creativity', and therefore the (possible) *automatization of artistic work*: Sometimes, we forget that the idea of computational machines, or more specifically AI, making art adds to a rather nervous discourse on the automation of work through smart machines.[5] If machines can produce art, the assumption goes, they could mass produce art for everyone, serially, industrially. Then there would no longer be auratic works of art made by rare geniuses. And nobody would have to pay millions for artworks.

3 Cp. the insightful article by Sudmann (2019).

4 AI systems do not necessarily have to produce blurry images—but 'modern art' in a way has to transgress notions of realism in a way.

5 Cp. my article "Digitale Technologien und das Verschwinden der Arbeit" (2019). See also Bogost (2019): "Given the general fears about robots taking human jobs, it's understandable that some viewers would see an artificial intelligence taking over for visual artists, of all people, as a sacrificial canary."

In part II, I want to look specifically on 'information aesthetics', a discourse and practice from the 1960s, already driven by the idea to produce art *by* computers (not mainly *with* computers as tools).[6] In part III, I will discuss somehow speculative reasons why the idea to automatize artistic work (and hence simply mass produce 'art' with machines) did not seem to work back then.[7] In part IV, I'll come back to the recent 'gold rush' in 'AI art' and re-read it in the light of the discourse on information aesthetics.

II. Short Remarks on Information Aesthetics

The origin of information aesthetics is the attempt to formally determine the 'measure' of aesthetics. In 1933, David Birkhoff formulated an equation (Fig. 3) in which the variable O denotes the measure of the order of a given work and the variable C the 'complexity'. M is the degree of how aesthetic an artwork is.

$$M = O/C$$

Fig. 3: Birkhoff-Equation

According to it, the more ordered and the less complex a work of art is, the more aesthetic it would be. Apart from the fact that it is difficult to understand exactly how to determine the degree of order and complexity in a specific case, this attempt to express the 'aesthetic quality' of art in an equation seems strange to us today. Nonetheless, especially in the 1960s there were several attempts to formally understand art and its aesthetic criteria and consequently to produce it synthetically with computers (although the computers were slow, the output possibillities limited and computer technologies were only available in research institutions and large companies).

6 There are even more precursors, for example the computer cluster Iamus, who is composing music and even released an album, (see: http://melomics.uma.es/). The slogan is, not surprising, "music for everybody, everything", promising a democratization of art. Another important example would be *Aaron*, which is a software system that in collaboration with its inventor Harold Cohen produces paintings (see: https://www.computerhistory.org/atchm/harold-cohen-and-aaron-a-40-year-collaboration/).

7 It's quite problematic that an otherwise excellent collection of essays on ‚Computers and Creativity' (McCormack/d'Iverno 2012) does not include a single contribution that tries ot relate the central question of the volume to sociological questions concerning the art system. 'Art History' is only mentioned a few times in the outstanding contribution by Frieder Nake—except of Nake's paper most contributions in this volume de-socialize and de-historicize the question of the possible creativity of machines.

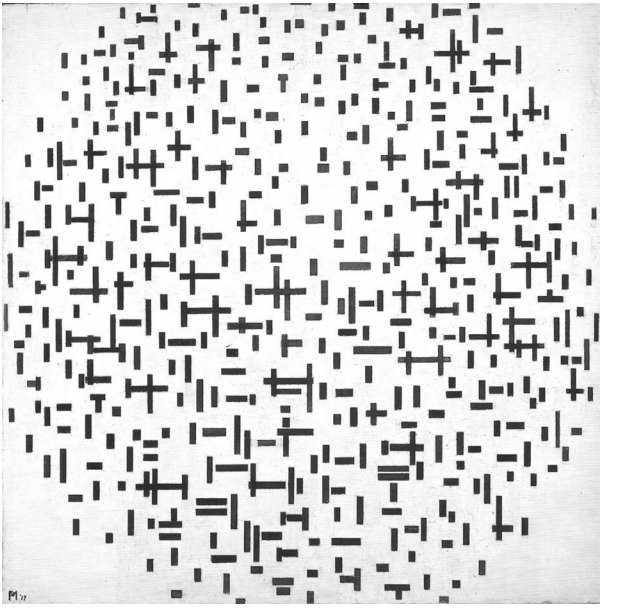

Fig. 4: Piet Mondrian, Composition With Lines (1917)

In 1967, Michael Noll describes in his essay "The Computer as a Creative Medium" an information aesthetic experiment with a painting by Mondrian (Fig. 4).[8] Noll writes:

> [An] experiment was performed using Piet Mondrian's "Composition With Lines" (1917) and a computer-generated picture composed of pseudorandom elements but similar in overall composition to the Mondrian painting. Although Mondrian apparently placed the vertical and horizontal bars in his painting in a careful and orderly manner, the bars in the computer-generated picture were placed according to a pseudorandom number generator with statistics chosen to approximate the bar density, lengths, and widths in the Mondrian painting. Xerographic copies of the two pictures were presented, side by side, to 100 subjects with educations ranging from high school to postdoctoral; the subjects represented a reasonably good sampling of the population at a large scientific research laboratory. They were asked which picture they preferred and also which picture of the pair they thought was produced by Mondrian. Fifty-nine percent of the subjects preferred the computer-generated picture; only 28 percent were able to identify correctly the picture produced by Mondrian. In general, these people seemed to associate

8 It is by the way one of the earliest texts in which the computer is described as a medium—the computer's becoming a medium thus goes back to questions of art and aesthetics.

> the randomness of the computer-generated picture with human creativity whereas the orderly bar placement of the Mondrian painting seemed to them machine-like. This finding does not, of course, detract from Mondrian's artistic abilities. His painting was, after all, the inspiration for the algorithms used to produce the computer-generated picture, and since computers were nonexistent 50 years ago, Mondrian could not have had a computer at his disposal. (1967: 92)

Fig. 5: Simulated Mondrian by Michael Noll

Noll thus simulates a Mondrian (Fig. 5) on the basis of a statistical distribution which is supposed to describe the arrangement of the lines in Mondrian's work. And since this distribution looks more 'disordered', a group of observers, presumably not to be regarded as representative, identifies the simulated Mondrian as the real one, while the real one appears too regular and mechanical.[9] Does this preference show that the disorderly picture is understood to have a higher aesthetic quality? That would contradict Birkhoff, but it does remind us in an uncanny manner of the dis-

9 A similar discourse can be found in recent AI art: "According to Elgammal, ordinary observers can't tell the difference between an AI-generated image and a 'normal' one in the context of a gallery or an art fair" (Bogost 2019).

torted, blurred, and 'arty' qualities of recent AI-generated portraits. Or is it because the disorder is simply understood as a reference to human authorship? It could also reveal that the artiness of a given picture does not depend on perceptual features alone… It should be noted that Noll tries to find formal, algorithmic rules, allowing the production of a work of art that can be *identified* as a work of art. Noll is not the only one following this approach. Frieder Nake, one of the most important theorists and practitioners of information aesthetics, also tried to trace the pattern of image production in Paul Klee's work and thus produce a computer-generated Klee (Fig. 6).

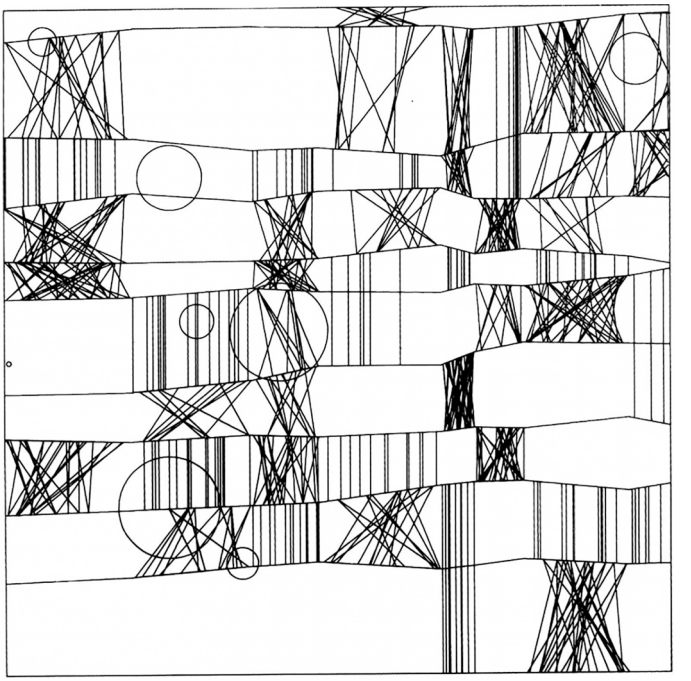

Fig. 6: Simulated Klee by Frieder Nake

Admittedly, these examples are taken out of context and an appropriate discussion of information aesthetics would have to consider at least the positions of Max Bense, Rul Günzenhäuser, and Abraham Moles, which can't be addressed in this essay. In any case, from today's point of view, these attempts seem rather strange, because they remove the works of art from their historical context and reduce them to abstract structures that can be formalized—similar to recent AI-produced art. It must be therefore emphasized that the aesthetic strategies of Mondrian and Klee have reacted to certain historical questions, not the least of them the history of art itself. Information aesthetics and AI art seem to understand artworks as ahistorical, formal structures—although they could also be seen as responses to

a certain historical, in this case computational, context of art as such (cf. to the vexed relation between form and history amongst others Buchloh 2015). This also seems to reappear in recent AI art: "That might be an inevitability of AI art: Wide swaths of art-historical context are abstracted into general, visual patterns." (Bogost 2019)[10]

However, these attempts are relatively characteristic of a larger development, namely the attempts to formalize cognitive labor and, if possible, to transfer it partially or entirely to machines, for which computers as symbol-processing machines are suitable. [11] Early texts from the domain of Computer Science, such as Douglas Engelbart's "Program on Human Effectiveness" or J. C. R. Licklider's "Man-Machine Symbiosis" from the 1960s, are programmatic for this. (cf. Licklider 1960: 4-11; Engelbart 1991: 235-244). Noll, Nake and others try to make aesthetic work formalizable and, in principle, executable by machines. Their attempts can be understood, whether intentionally or not, as contributions to the automation of aesthetic work.

In other forms of commodity production, these processes normally contributed to the cheapening of commodities—and therefore to 'democratization' in the sense of goods becoming more affordable for more people. That was obviously not the goal of information aesthetics, since—for instance—Nake operated as the author of the work (and not Klee); and if he would have called his work a Klee, this could have led to serious legal problems. But even if this democratization of art would have been the goal of information aesthetics—to start an industrial, cheap mass production of, say, Mondrians and Klees—this would not have worked in the art system: Art is not only a question of formal structures and strategies, it is also a question of historical and especially social places and roles. We will now turn to that.

III. Art, knowledge and work

Apparently, art it is not directly threatened by computerization. Art does not appear in the highly discussed Oxford research report, which started a nervous discussion on the disappearance of work: the only activity that resembles artistic practice is that of the 'art director', who gets off quite lightly with a 95th place on the computerizability probability list. (cf. Frey/Osborne 2013: 59) Artists can-

10 The same is true for Schmidhubers contribution to McCormack/d'Iverno (2012). It's again an approach to formalize aesthetic value of an object—without really posing the question if this value is not derived from the relative historical position of the artefact and not (only) of its formal, internal structure.

11 Cp. on the history of Automation Noble (1984).

not become the object of rationalization and their works will continue to be called 'works'. Artistic work seems to be a type of work that cannot or should not be formalized, algorithmized, and consequently neither reproduced mechanically without further ado. This suggests the suspicion that artistic work is not really work, but another form of activity or—at least—another form of work. But why?

At least at first glance, the art market looks exactly like any other market: artists are well aware that they have to earn money with their work. Some succeed to an almost inconceivable degree, but most have serious difficulties competing in the art market. Artists are also subject to the fact that work is "a necessity of refinancing their expenses" (Luhmann 1994: 191). Work, money for one's own work, market, competition, rich versus poor—this first glimpse suggests that the art business does not differ in any way from other forms of production. It is not a realm of freedom, but only a kind of service or consumer goods industry that serves a special market.

Therefore, we can find cases where work is technologically made superfluos in the art business. If one looks at a large studio, such as Studio Olafur Eliasson, one could observe that the introduction of new computer-assisted technologies directly leads to the disappearance of work. A series of jobs, e.g. website maintenance, management, public relations, logistics, up to the people that clean the studio, may be replaced. Inasmuch as Studio Olafur Eliasson also operates under capitalist conditions, it is likely to save costs by rationalizing the way work is done. However, this aspect is external; it does adress the problem that information and generative aesthetics have pointed to, mainly if the work of making art *itself* can be rationalized. Although Olafur Eliasson could not realize any of his elaborate projects without his team, the disappearance of the teamwork in the black box of the author's name does not seem to affect art 'in itself'. And insofar the teamwork is blackboxed it may change its composition without changing anything in the 'artiness'of Eliasson's art.

This finally brings us to the core of the problem raised by information aesthetics. Obviously, the idea of art without the intervention of a human author or causer—and even if its role consists precisely in demonstratively withdrawing—does not seem plausible to us. We do not see art appearing in nature.[12] The question implied in information aesthetics and AI art is different from the observations in Walter Benjamin's famous essay *Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit*, where everything revolves around the question of the technical reproduction of the *product, the work of art*. But in information aesthetics and AI art the question of the *reproducibility of the work that produces the work of art* is central. The fact that the technical reproduction of this work does not seem possible

12 Although art was historically sometimes understood as being close to nature ('Kunstschönes' vs. 'Naturschönes'), cp. on this Kant (1914 [1790]).

does not have to be attributed—this would be a very traditional answer—to the 'genius', which is ultimately of divine origin and thus per se untechnical. Luhmann remarks: "The artist's genius is primarily his body" (2000: 38). One could therefore simply say that the separation of knowledge from the working body, characteristic of the progression of capitalism and perhaps first discovered by Marx, does not or cannot take place in art. But why?

One possible reason would be that the work of art—despite the attempts of the information aesthetics (at least according to Birkhoff) to formalize precisely the complexity—is *too complex* and thus the work that produces it cannot be sufficiently understood. Thus, it is noticeable that Noll and Nake focus on a certain type of painting, which is determined by the extensive recourse to basic geometric forms. Such forms seem simple enough to suggest their formalization, while other more complex ones would elude them. Obviously, technology progressed: Nowadays geometric patterns do not suffice to demonstrate the creativity of computing systems, it has to be (albeit blurry) portraits. Portraiture is historically connected to a history of 'genius'. As was remarked in the beginning, such portraits are hardly the status quo of art today[13]—using machines to create figurative art is less about AIs critically reflecting on contemporary art (at least when Nake and Noll made their works, abstract painting was quite central), it is more about the new powers of computer graphics.

But coming back to the vexed question of auctoriality: Even with geometric forms, it is true that we cannot quite imagine their existence as art without an artist. For even if an artist—like Nake, for example—were to define himself precisely by delegating all work to machines, we would still call the result 'a work by Nake', which is similar to the finding already mentioned that the production within a studio with a division of labour is 'black boxed' under an author's name. A similar process seems to occur with the debate regarding the *Portrait of Edmond de Belamy* on who is the author in the last instance.

The work of art is the result of a work in which body and knowledge, i.e. the knowledge of *how this specific work is to be produced*, cannot be separated—and that means that the function of the 'author' is central. (cf. Graw 2012: 43-45) At least, this is the ideological figure that has historically emerged as characteristic of the art system. Therefore, works of art must not be the connection between knowledge and *a false body*—this would be what we call forgery. Even if, for example, one were to take a work by Donald Judd that according to Sebastian Egenhofer (2008: 214) is "dissolved in the anonymity of the industrial dispositive" , it would still be pointless if another person or simply a company, based on the knowledge of how it is made, were to produce the same object again, as it is also done in principle in the industrial production of reproductions—it would not be possible

13 Perhaps with the exception of some types of 'post-modernist' neo-figurative painting.

to recognise this reproduction as a work of art (of 'Donald Judd'). Or let us take another example: Elaine Sturtevant borrowed the screen printing matrices from Warhol for the *Flowers* and printed the *Flowers* again, in 1991 even made an entire exhibition with *Warhol Flowers*—and Warhol, referring to the production process of the *Flowers, is frequently quoted for saying*: "I don't know. Ask Elaine." (Quoted in: Arning 1989: 44) Nevertheless, Sturtevant's appropriation of Warhol's knowledge is not a rationalization of Warhol's work in the sense that Sturtevant now simply makes 'cheaper Warhols', but she rather makes 'Sturtevants'. Diedrich Diederichsen points out that the work of assigning relevance by curators, critics, audiences, etc. also belongs to the work that creates the artwork and its market value. (cf. Diederichsen 2012: 99) The 'distributed' character of this work makes it impossible to rationalize—since it continuously accompanies the work, i.e. never ends, and can also take unpredictable turns in the future. 'Sturtevants' can become more important and more expensive than 'Warhols' in the future. It could even be argued, that Sturtevant by her appropriation makes the author-function of Warhol visible in the first place.

Of course, you can try to save production costs, but it does not make sense to offer Warhol's *Flowers* cheaper, because only *Flowers* from Warhol's Factory are accepted as originals, which of course does not exclude the possibility of producing inexpensive reproductions of *Flowers* as posters (which do not count as work of art, but its reproduction). Warhol's life ended in 1987 and that stopped the production of original 'Warhols'—and that's a necessity: In the long run, the mortality of artists makes artworks scarce and that's why they have market-value (cf. critically on the notion of scarcity Panayotakis 2012). In capitalism, no one can have an interest in a 'democratic' production of artworks.

Obviously, the crucial difference is that in art itself, reproductions, such as Sherrie Levine's re-photographs or Sturtevant's repetitions, are always originals (which, through repetition, exhibit the discourse of the original). In contrast, in 'conventional' commodity production there are no originals,[14] but only series of reproductions, e.g. of *Flowers* posters, which all refer to the original pieces of art but are all serially of equal rank. And once again: to be original means to be connected with the body of the artist. *This work cannot be detached from the body, which is why it cannot be formalized and rationalized.* The attempts of information aesthetics may seem pointless because here a rationalization dispositive from industrial production is transferred to an area that blocks it. Or as Adorno puts it:

14 A difficult case seems to be product counterfeiting, insofar as the term already implies an 'original product'—but even original products exist as a series of identical products. Product counterfeiting means that a product wrongly claims to belong to that series. This differs from the relationship between original and copy in art.

> On the other hand, however, whenever autonomous art has seriously set out to absorb industrial processes, they have remained external to it. […] The radical industrialization of art, its undiminished adaptation to the achieved technical standards, collides with what in art resists integration. (1997 [1970]): 217).

But to be clear about this: That does not mean that art in itself is an utopian realm of freedom, freed from the restrictions and rules of commodity production. It just means that it is a field of commodity production with different, historical, contingent rules and that's why art is in a way economically exceptional (cf. Beech 2015)

IV. Conclusion

It seems that the question whether machines can be creative or not can not be answered ontologically. What 'creative' means seems to be too historically contingent and malleable. Think of the statements why machine-learning is not creative: Bogost (2019) insists that "any machine-learning technique has to base its work on a specific training set." That's true—but doesn't that also apply to human artists who have to train their perceptual and e.g. painterly skills? Or, again Bogost (ibid.): "A neural net couldn't infer anything about the particular symbolic trappings of the Renaissance or antiquity—unless it was taught to, and that wouldn't happen just by showing it lots of portraits." Is that not true for humans too? And moreover: Is 'creativity' not always distributed between human and non-human actors? Don't human artists often say that their artwork 'answers' while they are in the painting process? Can one be an artist without any kind of non-human materials and mediators that are not only transparent tools for a pre-given 'vision' of a work (cp. Hensel/Schröter 2012)? And couldn't we even imagine advanced AIs, perhaps in the shape of humanoid robots that could be artists (cp. Kjøsen 2012 for a similar argument relating to the labour theory of value)? Could not the works they produce then be tied in the same way to their 'bodily' presence as is the case with human artists? Think of virtual popstars like Miku Hatsune[15], which can operate as a kind of enunciator, having a kind of 'signature' (here: her voice)—but of course the mortality of the artist as a kind of natural scarcity that limits the work is not given in such a case (on the notion of a virtual star, see Schröter 2000).

Although at the moment the idea of artworks produced by machines seems ahistorical and absurd, because artworks have a place in history and have to be tied to the body of the artist and therefore be scarce and so on, it may nevertheless be that in a far future things could change: Perhaps a democratization of art needs a different social context—as does the democratization of AI, ripping it out

15 https://en.wikipedia.org/wiki/Hatsune_Miku.

of the hands of big monopolies. That's why it seems so appropriate that the much discussed AI-painting is a portrait of Edward Bellamy—since Bellamy wrote in 1888 the famous novel *Looking Backward 2000-1887*. The AI looked back, so to speak, to a historical mode of painting in a historical style and with somewhat dated gestures (the signature), but this might also be a metaphor of looking back from a possible future, in which AI can be an artist. Bellamys novel centrally is about a very different economy of the future, a kind of post-capitalism, that might indeed be the precondition for the democratization of AI as of art. And in the novel several futuristic media are mentioned, which nowadays seem absurd of course—but which can also be read as metaphors of a future mediality, in which even 'creativity' might at least partially be automatized (for an opposing view, see Kelly 2019).

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