



## The description of an infinite set of drawings

Pau Waelder

The digital revolution did not take place in the 1990s. It happened three decades earlier, in the aesthetic experiments of several artists, some of whom presented their work to an audience in three exhibitions during the year 1965 [\[1\]](#). The first one was set up at the Institute of Technology, the University of Stuttgart, in a room where philosopher Max Bense had his seminar. During two weeks, from February 5th to 19th, the mathematician Georg Nees showed a selection of his algorithmic drawings under the title *Computergrafik*. Two months later, the Howard Wise Gallery in New York opened an exhibition of works by Michael Noll and Béla Julesz that lasted from April 6th to the 24th. Inspired by the first show, between November 5th and 26th, the Wendelin Niedlich Gallery in Stuttgart hosted a selection of works by Frieder Nake under the title *Computer Graphics*, in which Nees was invited to display his drawings again. Nees, Noll, and Nake had been working on artistic experiments with computers during 1963 and 1964, and so did other artists, such as Ben Laposky and Herbert W. Franke, who worked with analog computers, as well as the Japanese Hiroshi Kawano. All of them were mathematicians or engineers, except for Kawano, who studied philosophy and aesthetics. Soon other pioneers with a background in fine arts would join them: Charles Csurí, who created his first computer animated films in 1965, Manfred Mohr and Vera Molnar, both of whom started creating artworks with computers by the end of the decade. These artists had access to computers at a time when no one had a personal computer at home and few people actually knew what a computer was. They wrote programs that provided a set of instructions (algorithms) so that the computer would execute an ever-changing artwork. The intervention of the machine in a process that, until then, was carried out entirely by the artist, introduced a radical transformation in the arts—one that would take some time to assimilate. Frieder Nake states that, in computer art, it is “the machine that makes the art,” although the program itself is a creative form of expression enabling the endless production of visual compositions: a “finite operational description of an infinite set of drawings.” [\[2\]](#)

By integrating the machine within the artistic process, these pioneers were breaking new ground, and for this reason their work was usually either ignored or received with outright hostility. Noll’s exhibition in New York did not sell at all, while Nees’s and Franke’s shows took place in marginal spaces, from the art world’s point of view (although Franke did sell some works). At the opening of Nees’s exhibition, several artists expressed their disapproval of the possibility that a creative act could be achieved by computational means. The artists were so outraged that Max Bense, in order to calm them down, came up with the term “artificial art” as a way to distinguish art made with computers from art made by the artist himself. [\[3\]](#) Manfred Mohr was also severely criticized for using computers, as the board displayed in his landmark exhibition *Une Esthétique Programmée* (1971) shows. Mohr presented at the Musée d’Art Moderne de la Ville de Paris twenty-

eight algorithmic drawings and a Benson 1284 plotter, in which he showed how the drawings were made. A large white panel was placed for visitors to express their opinions, under the heading “What do you think about computer-assisted aesthetic research?” The panel was covered in scribbles, some of them expressing positive reactions, many others angrily stating that nothing of any artistic value can come out of a machine. [4] Even in the influential and widely discussed exhibition *Cybernetic Serendipity* (1969), pairing art and computers seemed controversial: the curator Jasia Reichardt cautiously described the works on display as “still or moving pictures, that often resembled what we call ‘art’ and exhibit in public galleries” [5]. Actually, computer art did resemble what was called “art” at the time, namely conceptual art, concrete art, and other forms of painterly abstraction. Moreover, artists such as Nees, Nake, and Noll prefigured Sol Lewitt’s famous statement: “The idea becomes a machine that makes the art.” [6] Even so, computer art continued to develop during the following decades, gathering discreet attention, while its contribution to artistic creation slowly and seamlessly morphed into the myriad forms in which artists use computers today.

Fifty years after those three pioneering exhibitions, Wolf Lieser, director of the DAM Gallery in Berlin, has curated a group show with the work of twenty artists that draws a connection between the first experiments with the Zuse Graphomat Z64 plotter (also displayed in the gallery) and the latest developments in generative art. Titled *Aesthetica* (as a nod to Max Bense’s publication of the same title from 1965), the exhibition celebrates half a century of computer generated art with a selection of twenty plotter drawings by some of the first artists who used computers, such as Georg Nees, Frieder Nake, Roman Verostko, Vera Molnar, and Manfred Mohr; those who have significantly contributed to the digital revolution of the 1990s, such as Vuk Ćosić, Rafael Lozano-Hemmer, Christa Sommerer, and Laurent Mignonneau; and those whose work became known in the 2000s, such as Casey Reas and Antoine Schmitt. In this way, the exhibition underscores the lineage of digital art and explores its history without being nostalgic. By displaying an artwork from 1965 next to another from 2015, the qualities of both are enhanced, since the latter gains a historical background and the former speaks to the present. Algorithmic art is therefore not a relic of the past, but rather a current form of contemporary art with a long history. The work of Casey Reas illustrates this statement. Co-creator, with Ben Fry, of the open source programming language Processing, which has had a deep impact on the visual arts since it was launched in 2001, Reas develops generative software for his artistic research that he once described as “a kinetic drawing machine with a beginning but no defined end.” [7] Echoing the words of Frieder Nake about his own work in 1965, this definition stresses the condition of the algorithmic artwork as one of an infinite number of possible artworks, generated by a process that could go on forever.



In fact, some of the participating artists usually present their work in the form of an ongoing process. Christa Sommerer and Laurent Mignonneau's *Portrait on the Fly* (2015) is an interactive installation that forms a portrait of the viewer with a swarm of several thousand flies. [8] Displayed on a monitor with a camera, the portrait is constantly changing as the flies react to the viewer's movements and facial expressions. The artists are also creating a series of "1960s plotter-style drawings," the first of which is their self-portrait, included in this show. Vuk Ćosić's *Very Deep ASCII* (2015) is a re-elaboration of his earlier work from the 1990s, in which he used a software created by himself to convert a scene from the pornographic film *Deep Throat* (1972) into an ASCII animation. This time, he has elaborated a cuneiform version of ASCII that is superimposed over a contour trace of a still from the film. [9] The plotter drawing shows this image, which can be decoded with a bit of imagination. Antoine Schmitt's *Carré Blanc* (2015) is related to two generative installations, *Pixel Blanc* (1996) and *Pixel Noir* (2010), that play with the tension between order and chaos in an infinite routine. In this plotter drawing, the artist pays homage to the figure of the square inspired by Molnar, Mohr, and Nake, as well as Malevich, and also the shape of the pixel itself. [10] Schmitt created each drawing by writing an algorithm that draws random scribbles around a square. The process is displayed on a screen and stopped by the artist when he decides that it is done and ready to be printed. Rafael Lozano-Hemmer's *Seismoscopes* (2009) are a series of devices that detect any vibration around them and record it as a drawing of a philosopher using an automated plotter. Given the variations in vibration and the random paths used by the machine to draw the portrait of the philosopher, each image is unique. In this case, the process itself is so important that the artist specifies that "the artwork is the device itself, not the drawings it makes: the collector or curator may give these drawings away, they may exhibit them as a pile on the floor or hang them neatly on the walls." [11] Finally, both Casey Reas and Manfred Mohr conceive their work both as generative software, displayed on a screen, and plotter drawings. Manfred Mohr explains that displaying his compositions as an ongoing process was motivated by the need to communicate their increasing elaborateness: "I realized that the complexity of my work rose to a point that I could not communicate to the viewer this content in an easy visual way. I decided to render this development of signs (images) in a real time movement on flat screens to visualize this complexity in a specific and adequate way." [12]

While *Aesthetica* [13] only displays the plotter drawings (except for Lozano-Hemmer's *Seismoscope*, which includes a video of the device), this does not diminish the value of the corresponding artworks. On the contrary, it draws attention to the processes that lead to the output in each of the other pieces. These processes cannot be seen, but they can be imagined, inviting the viewer to look beyond the image itself and think about its making. The decision of displaying only plotter drawings, and bringing an original Zuse machine to the gallery, speaks of the intention to give the early works a proper environment that highlights their historical value and moves away from the more flashy and superficial aspects of media art, which, as Sommerer and Mignonneau state, is "an ephemeral field that is obsessed with novelty and change." [14] DAM is probably the only gallery that could set up an exhibition like *Aesthetica*, given Wolf Lieser's expertise and outstanding support of the pioneers of computer art. Lieser has stated that it was precisely the lack of

interest towards this art and its historical development that inspired him to create the Digital Art Museum and later on to open the DAM gallery. [15] Today, media art still struggles to find its place in the mainstream contemporary art world and the galleries, while its roots are invisible to a large segment of the public and even to some of the artists currently working with generative software. Shedding light on the work of the pioneers, not as relics but as a source to understand the art of our present, is a commendable and necessary task.

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## Notes

[1] Frieder Nake provides a detailed account of these exhibitions and their historical relevance in his text “A Calm and Significant Revolution” in *AESTHETICA – 50 Years of Computer Generated Art*. Exh. cat. Berlin: DAM Gallery, 2015, 12-15.

[2] *Ibid.*, 13.

[3] Nake, Frieder. “Roots and Randomness – A perspective on the beginnings of digital art.” *The World of Digital Art*. By Wolf Lieser, Postdam: h.f. Ullmann, 2010, 39-41.

[4] Mohr, Manfred. [“Une Esthétique Programée.”](#) emohr.com. Web. 16 August 2015.

[5] Quoted by Lieser, *op. cit.*, 21.

[6] Lewitt, Sol. “Paragraphs on Conceptual Art.” *Artforum* (June 1967): 79-83.

[7] Reas, C.E.B. *Process Compendium, 2004-2010*. Exh. cat. Los Angeles: Reas Studio, 2010. 7.

[8] Sommerer, Christa and Laurent Mignonneau. [Portrait on the Fly](#). Web. 17 August 2015.

[9] Ćosić, Vuk. [“Plot thickens.”](#) free.janezjansa.si. April 2015. Web. 17 August 2015.

[10] Schmitt, Antoine. [Carré Blanc](#). Web. 17 August 2015.

[11] Lozano-Hemmer, Rafael. [Seismoscopes](#). Web. 17 August 2015.

[12] Waelder, Pau. “Manfred Mohr: art as a calculation.” *art.es*. 47 (2011): 70.

[13] “Aesthetica. 50 years of Computer Generated Art”, [DAM Gallery](#).

[14] Sommerer and Mignonneau, op. cit.

[15] Lieser, op. cit., 10.