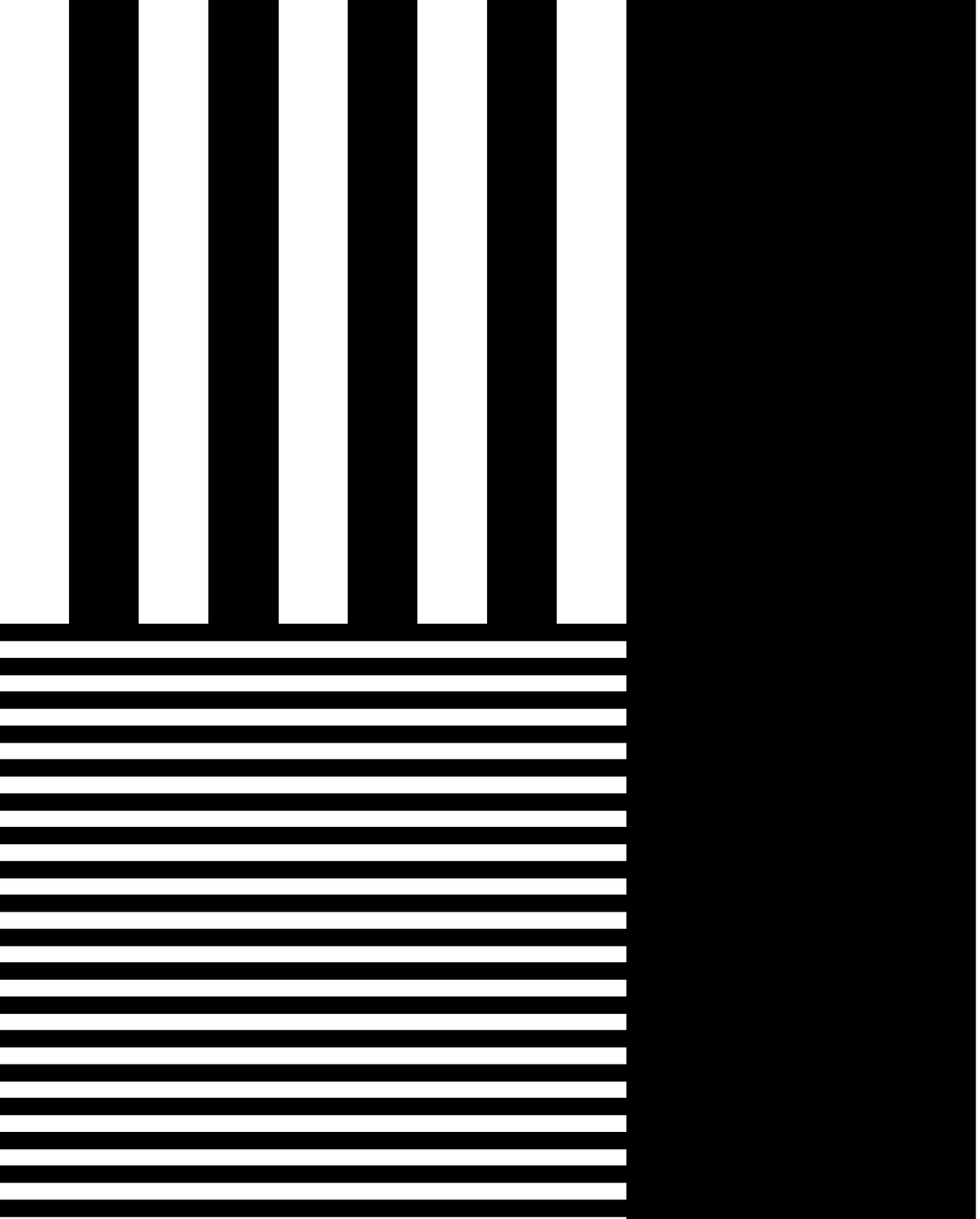

AUTOMATED PHOTOGRAPHY

Edited by Milo Keller, Claus Gunti, Florian Amoser
A research project by the MA Photography at
ECAL/University of Art and Design Lausanne

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AUTOMATION AND INTENTIONALITY — PHOTOGRAPHY WITHOUT THE CAMERA

Several Trillions of Years Without Intentionality

Perhaps one of the works that best exemplifies the production of automatic images is *Every Icon* (1997) by the American John F. Simon. [01] This famous conceptual work consists of a program that will display on a grid of 32x32 squares, which can be coloured either black or white, all possible variations at a rate of 100 variations per second. The program was launched online in 1997, starting with the first variation in which the square at the top left changed colour from white to black, and so on. While in theory the program will display every possible image in this resolution —and therefore also any image made or not made, past or future, in this resolution— the program actually takes several hundred trillion years to perform all the results. While the work combines formal simplicity with conceptual beauty, the immensity of the project is also a statement about the impossibility of exhaustively completing the sample of images that we can produce, whether they are images made with traditional equipment or with automatic systems. The work, moreover, raises another essential point, namely the intentionality involved in the production of an image. In this case, I use the ordinary meaning of the term intentionality, i.e. the property of having an intent, a resolution. However, it is interesting to note that in a philosophical context the concept of intentionality, defined in this case as the capacity of the intellect to refer to an external object, has sometimes been put forward to distinguish the human intellect from machines. Intentionality is a fundamental concept in the work of John Searle, for example, who developed the famous Chinese room argument to demonstrate that artificial intelligence cannot be compared to the human mind. [02-03] Undoubtedly, automatic

01 John F. Simon Jr. *Every Icon*, online artwork, accessed on 4 December 2020, http://www.numeral.com/projects/web/everyIcon/everyIcon.php

02 John R. Searle, *Intentionality: An Essay in the Philosophy of Mind* (Cambridge University Press, 1983).

03 John R. Searle, "Minds, Brains, and Programs," *Behavioral and Brain Sciences* 3, No. 3 (1980): 417–424.

photography, i.e. the generation of images through systems that do not make use of traditional cameras, be they analogue or digital, but produce images through machines or autonomous systems, has opened the door to a new photographic approach and the production of images that push photographic aesthetics towards new horizons. Yet, automatic photography, as Simon's work exemplifies, is useless without a choice, a guide, determined by a subject who has the intention of taking or creating a particular photograph. Below, I discuss some examples of recent works that allow me to offer some reflections on their cultural interest, what makes them artistic and how we can appreciate their qualities and understand them as artworks.

Automatic photography, in a broad sense, is not a recent phenomenon. Photography itself, whose invention resulted from a combination of centuries-old discoveries and research in both chemistry and optics, is as such a practice already born with the aim of taking images automatically. In fact, from the very beginning, photography was a plural invention, based on different techniques, such as Daguerre's daguerreotype, Talbot's calotype and Bayard's direct positive. Over the decades, other processes related to photography but not using cameras have been employed, such as photograms, collages, the photographic appropriations of Richard Prince and Sherrie Levine, or William Burroughs's cut-ups. These and other processes involving randomness or relying on simple algorithmic processes, whether digital or not, in the selection of images can be considered partially automatic systems. Today, automatic photography refers rather to the production of images similar to photography by automatic systems and not traditional cameras operated by human beings. To this group belong above all images made with computers, such as images produced by specific artificial intelligence programs, pictures collected via cameras in public spaces, or images made in virtual universes, as well as 3D scans and photographs created by industrial robots equipped with cameras, for example for the promotion or archiving of design products. One may wonder whether these images are still photographs, however realistic they may be. In truth, if we were to stick to the etymology of the word, in many of these cases we should certainly not use the word photography at all. But language, as the second Wittgenstein taught us, is always evolving, and therefore sticking strictly to the etymology of a term is never a suitable strategy for making sense of things, especially cultural phenomena.

Photography and Computation

The invention of the computer and then the accessibility of computers, first in universities, and later as a domestic product, allowed artists to create automatic images with these machines as early as the late 1960s. Pioneers such as Frieder Nake, Michael Noll and Vera Molnar wrote computer programs generating abstract images, while artist Harold Cohen devoted his entire career, after starting out as a painter, to the development of an artificial intelligence program (AARON) capable of creating drawings autonomously. His aim was first of all to question the very concept of an image, its ontology, so to speak, to understand what makes a mark left on paper acquire a representative character and how an automatic system can learn to represent objects of which it has no knowledge. Cohen mainly used the Lisp language to create his program, which can rightly be considered an artificial intelligence program, and it is no coincidence that his work has often been associated with this research. Yet, the artist has always distanced himself from the objectives of research in the field of artificial intelligence and has always claimed not only his artistic intentions but also the epistemological interest of his work, particularly with regard to understanding what an image is and its representative properties. [04]

Interest in artificial intelligence has been revived in recent years, thanks to progress in artificial neural networks resulting from the increase in computational power and the possibility of collecting and managing large amounts of data. In particular, in the field of image creation, the use of generative adversarial networks (GAN) has had spectacular results in terms of photographic realism. The internet has certainly fostered the popularity of these systems, and we have all seen a multiplication of images of cats and dogs as well as people portrayed with amazing precision. Inevitably, several artists have appropriated this technology, facilitated by the possibility of using off-the-shelf programs. But what distinguishes a work of art created using an artificial system from images created by an IT company to promote their products? How can we evaluate the artistic qualities of a work of art that is apparently created autonomously? And what are the contributions of automatic photography to cultural production? In the following examples, I will discuss several works that I have chosen for their diversity, which make more or less direct use of autonomous systems, although I would like to stress from the outset that completely autonomous systems do not exist.

04 I dedicated a chapter in my book on generative art to Harlod Cohen and in particular to his desire to distinguish himself from research in the field of artificial intelligence: Boris Magrini, *Confronting the Machine: An Enquiry into the Subversive Drives of Computer-Generated Art* (Berlin: De Gruyter, 2017).

The Dark Side of Facial Recognition

In the field of automation and images, the use of surveillance cameras accompanied by artificial intelligence systems for face recognition is certainly one of the most discussed applications in recent times. The Belgian artist Dries Depoorter has created a particularly interesting work on this subject: *Surveillance Paparazzi* (2018), which consists of an installation made of a Plexiglas cube, containing a computer and two screens, which show the output of the program developed by the artist. [05] The program contains a database of portraits of famous people, more than 200,000 according to the artist. At the same time, the program accesses surveillance cameras in different locations around the world, which the artist was able to do either via a simple hack or because they were unprotected. The first screen of the installation shows the surveillance cameras searching in real time. The program analyses the faces of the people appearing in the field of view, and as soon as it recognises the face of a celebrity in the database, it records a screenshot, which is shown on the installation's second display. The result is shown together with the original image from the database, i.e. the celebrity's official page on Wikipedia, their name and the location of the camera as well as the percent of verisimilitude of the person photographed with the celebrity. As the title indicates, the installation works like an automatic paparazzo using surveillance cameras. Obviously, the cases in which the person photographed really is the celebrity are rare, if there are any at all. While Depoorter's work makes use of automatic photography, here perhaps in the most intuitive sense, it is clear that its interest does not lie in the aesthetic quality of the photographs taken, nor in its documentary value. The work is a critique of the use of face recognition in surveillance systems, raising issues of both privacy and system accuracy. Considering that automatic surveillance and face recognition systems in public spaces are becoming a widespread reality and that these are potentially associated with systems to identify criminals, for example, trained with already compromised databases (this is the well-known problem of algorithmic bias), the danger of such systems is of concern to us all. [06] Consequently, in the work Surveillance Paparazzi, we may be disappointed at first that the system has not spotted real celebrities, and we could be amused by its failure, but we soon realise that it is precisely this failure that is the main point of Depoorter's discourse, and it is anything but funny.

05 Dries Depoorter, *Surveillance Paparazzi*, accessed on 4 December 2020, https://driesdepoorter.be/surveillance-paparazzi/

06 Rashida Richardson, Jason Schultz and Kate Crawford, "Dirty Data, Bad Predictions: How Civil Rights Violations Impact Police Data, Predictive Policing Systems, and Justice," *N.Y.U. Law Review Online* 192 (2019).

New Myths in 3D Scanning

One photographic technique that can be included in automatic photography is 3D scanning, which actually consists of a wide variety of techniques, both optical and non-optical. In fact, while photogrammetry had already been developed in the 19th century, 3D scanning technology today is based on the creation of point clouds that require computing and computer skills. Iranian artist Morehshin Allahyari uses 3D scanning, 3D modelling and 3D printing to create images, videos, sculptures and installations accompanied by a narrative approach combined with a post-colonial and feminist critical discourse. The series of works *She Who Sees the Unknown* (2016 –) draws on myths and monstrous representations of female deities from the Middle Eastern tradition. [07] The artist's intention is to offer the opportunity to imagine alternative mythological figures to those commonly imposed by the Western narrative, which has by now colonised the whole globe. At the same time, her fictions touch on moments of real history, associated in particular with colonialism and the destruction or despoliation of cultural heritages. In this sense, the artist considers her work an activation and conservation of disappearing archetypes. Her use of 3D scanning and subsequent creation of 3D printed sculptures interestingly combines the tradition of artefacts having magical-ritual connotations with modern technology and critical discourse.

07 Morehshin Allahyari, *She Who Sees The Unknown*, accessed on 4 December 2020, http://shewhoseestheunknown.com/about/

Picturing the Body with Generative Adversarial Networks

In recent years, few technologies have shaken the collective imagination as much as the images produced through generative adversarial networks, which are largely responsible for a renewed interest in artificial intelligence. The work *Uncanny Mirror* (2018 –) created by German artist Mario Klingemann makes use of GANs to generate real-time portraits of visitors standing in front of the screen and the camera above it. [08] As visitors move in front of the camera, the artificial neural network recalculates the image and processes a new one that is displayed on the screen, giving the impression that the visitor is in front of a deforming mirror (hence the title 'uncanny mirror'). In this case the portrait is not simply an image captured by the camera and processed with filters, as it might seem at first glance, it is an image that the GAN produces ad hoc after having analysed and interpreted the visitors' faces, based on its previous learning of what a face is, determined by the image datasets with which it has been trained. Here too is a work that definitely makes use of automatic photography, but what makes Klingemann's work particularly interesting are the aesthetic qualities of the images that his GANs are capable of reproducing. The artist's decisive intervention took place in the selection of images with which he trained the discriminator, the neural network antagonistic to the generator. Klingemann has focused particularly on the human body in his works. On several occasions, in interviews and conferences, he has stated, even provocatively, that he has often used both paintings and pornographic images to train his GANs. Indeed, the formal qualities, colours and shapes of his images often have a slightly creepy character, uncanny indeed, and somehow vaguely recall the treatment of the body by painters such as Francis Bacon or Egon Schiele. This example shows that the use of automatic systems can yield very different results depending on the artist who uses them and can be guided and manipulated according to aesthetic choices that are related to traditional artistic research that pay attention to aspects such as the colour, shape and structure of the image. In this case, however, the manipulation does not intervene at the time of the creation of the image but beforehand.

08 Mario Klingemann, *Uncanny Mirror*, accessed on 4 December 2020, http://quasimondo.com

Glossy Avatars in Cinema 4D

With the arrival and widespread use of digital photography, the possibility of intervening on the image in post-production has become the norm. But what about hyper-realistic images made directly with computer programs such as Cinema 4D? Can we still consider them images linked to the world of photography or should they rather be associated with the world of painting and drawing? To what extent can we still use the term photography? Nicole Ruggiero uses Cinema 4D, a 3D graphics software, to create realistic characters and situations imprinted with an aesthetic that is both kitsch and glamorous, which could be partly related to the cybertwee trend. At the same time, Ruggiero collaborates with other artists such as Jeremy McKeheen, Molly Soda and Refrakt to produce interactive scenarios in virtual and augmented reality. The software used by these artists is not in fact automatic nor does it create real photographs, yet it is based on computational processes and automated tools for processing and rendering images, producing results that can be compared to photographs for their realism. Moreover, the development of immersive applications and games in virtual reality and especially in augmented reality, as is the case of Ruggiero's work *No Esc* (2017), complicates the border between the representation of reality and its construction in interesting ways. [09] With her works, Ruggiero intends to examine precisely the changes in behaviour resulting from the process of digitisation, accompanied by the propagation of social networks in which the role of the image, self-representation and self-enactment have become predominant. In this sense, the use of software for the creation of realistic 3D images is pertinent in a discourse that aims to explore the phenomenon of the creation of alter egos in virtual spaces by an ever-growing slice of the population.

09 Nicole Ruggiero, *No Esc*, accessed on 4 December 2020, https://nicoleruggiero.com/project/no-esc/

Non-Player Characters and Generative Worlds

What happens when an image or video is taken not of real scenes but of virtual environments in digital universes such as videogames? When artist Alan Butler takes screenshots of characters representing vagrants in the game *Grand Theft Auto V*, with an approach and aesthetic that approximates documentary photography, can we still talk about photography? [10] In-game photography is now a genre in itself, and like many others, Butler follows a practice comparable to photojournalism, even using a virtual camera provided as an accessory in the game. The pictures do not represent real characters but figures created by a virtual world that is partly generative and uses simple artificial intelligence to give life to its non-player characters (NPCs). A complex work created by Greek artist Theo Triantafyllidis, *Ritual* (2020) is a virtual environment developed using a gaming engine. [11] The work represents a place that could be located in the Californian desert, originally built as a mine, then turned into a prison and finally a movie set. The place is now inhabited by hyenas, crows and ants who take possession of the remains of our civilization with an irreverent attitude, perhaps warning us of our arrogance towards nature. The artist has designed and programmed this virtual universe, attributing an artificial personality with basic AI to the creatures that inhabit it. Hence, the generative character of this simulation and its evolution during its online existence can be related to a partly autonomous system, in turn generating moving images. The work is not only an online simulation but also an installation in physical space, which involves images, VR experiences and 3D printed sculptures based on events and interactions that took place in the virtual universe. Triantafyllidis frequently addresses themes related to violence, sexuality and discrimination. His use of video games, generative processes and artificial intelligence for NPCs offers an extremely creative and poetic example of partially autonomous systems that can in turn produce pictures, videos and sculptures.

10 Alan Butler, *Down and Out in Los Santos*, accessed on 4 December 2020, https://downandout.in-los-santos.com

11 Theo Triantafyllidis, *Ritual*, accessed on 4 December 2020. http://slimetech.org/ritual

Artistic Qualities of Automated Photography

On the one hand, the analysis of the previous works shows the versatility of image creation using partially automatic systems. Nevertheless, it is clear that images created completely autonomously do not exist. The author's intervention is fundamental, for example, in the choice of the image sample in the creation of a database to train the discriminator of an artificial neural network, in taking screenshots in virtual universes, or in post-production. Above all, we can point out that what makes these works interesting is not, or in any case not exclusively, the use of the technology that is being employed, but the intentionality of the author and therefore of the work, its reference to a discourse. Moreover, the work is not limited exclusively to the result produced, to the image as such, but also resides in its process, in its context of production, in its discursive values, consciously determined by the artist. These works are considered artistic because they also belong to a tradition that has been deeply marked by conceptual art, that is, a production that attributes importance not only to the formal aspects of the work but also to the process and discourse that complement it. Unsurprisingly, these criteria apply as much to traditional contemporary art production as to works made with automatic or partially automatic systems. Perhaps a more interesting question is to understand what the use of autonomous systems contributes to the creativity of a work. Each approach is evidently unique, and there is no unequivocal answer. While in Depoorter's work the use of automatic systems is consistent with a discourse that aims to question the implementation of facial recognition in society, in the case of Ruggiero's works, the use of 3D graphic software contributes to a discourse linked to the question of identity, gender and human relations in online interactions.

Finally, we can ask ourselves the question of how we can propose parameters to judge the value of these works made using autonomous systems. In truth, there are no universal parameters. It is essential to understand that every work of art must be judged according to parameters that are relevant to it. What is more, an artist's success is often linked to conditions that are foreign to the qualities of the work: the ability to position oneself in the art world and to acquire visibility. That being said, the examples discussed above make it possible to

postulate certain criteria. A first criterion, as already mentioned, could be the relationship between the content of the work —the discourse developed by the artist— and the process employed. The authenticity of the process —whether an artist has actually used GANs and developed a facial recognition program and not merely used a simulation of these, or other tricks— may be considered by some as an important criterion as well, although I personally believe that this does not necessarily have to be the case. Some works that have been questioned in the past regarding the authenticity of the process used —think of the controversial *Alba*, or *GFP Bunny* (2000), the green rabbit by Eduardo Kac— [12] have nevertheless succeeded in developing a relevant critical discourse. Another criterion could be determined by the ability of the work to address little known but important aspects of a given theme, or well-known topics but through a unique, original angle. Attention to presentation and to poetic and formal aspects may have a more or less significant importance depending on the project. Finally, we can consider that an understanding of the historical context and of the mode of artistic production with regard to the proposed scope and discourse certainly helps to make an art project much deeper and more relevant, from both a conceptual and formal point of view. Last but not least, the originality of the work, both in terms of concept and execution, remains a criterion appreciated by most people involved in art.

12 Eduardo Kac, *GFP Bunny*, accessed on 4 December 2020, http://www.ekac.org/gfpbunny.html

Conclusion

Among hackers and programmers, the idea that the simplicity or the elegance of a code has a value that goes beyond its usefulness seems widespread. In fact, a program for the execution of any task can be written in different ways, even if using the same programming language. However, the shortest code in terms of commands is often more valued because it is considered more elegant, if not more poetic. It is no coincidence that admiration for the elegance of a computer program beyond its functionality has an almost romantic, aesthetic aura. Just as a computer program can be written in various ways, so the use of autonomous systems is determined by the author's choices and intentions. Automated photography can open doors to new creative ideas, to new interesting and surprising aesthetics and formal solutions, but it is still the author of the work who determines its interest and qualitative value, as in traditional photography. The conceptual element is even more relevant here, comprising the approach, the subject matter and its execution. The definition of art is constantly evolving, but today the widespread idea that art can only be the product of an intellect endowed with consciousness and intentionality is probably still valid, as opposed to the use of the word art to describe surprising objects found in nature, whether organic or not. We can speculate, together with the brilliant Katherine Hayles, that systems other than humans, and thus also non-organic ones, can contribute to the development of cognitive processes, or what she calls "nonconscious cognition". [13] These processes certainly occur, even in the context of the works mentioned above. However, I am convinced that the author's intentionality remains a decisive element in the constitution of what we understand today as a work of art.

13 N. Katherine Hayles, *Unthought: The Power of the Cognitive Nonconscious* (Chicago: The University of Chicago Press, 2017).

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An increasing number of images are produced autonomously by machines for machines in a technological architecture that progressively excludes human intervention. A research project developed by the MA Photography programme at ECAL/University of Art and Design Lausanne, Automated Photography addresses this situation by investigating imaging technologies such as machine learning, drones, AR, CGI or computational photography. A collection of critical essays and interviews from curators, art historians, philosophers, artists, designers, media theorists and experts in digital culture aims to examine the implications of these transformations in terms of agency, data politics or relationship to reality, while a selection of visual projects explores the aesthetic and conceptual potential of automated photography. www.automated-photography.ch

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