About AI powered Image Generators

Threats

I went to see a video whose link was provided to me by J. Karl Bogartte:

The artist in this video seems to work in the field of illustration. And of course, he's right: AI-powered image generators could seriously impact his business...

I remember, a good fifteen years ago, entering the words "Surrealism and Science" into a search engine which returned me a few hundred HTML links leading to "Surrealism and Science Fiction" style images. As I am a good public, I generally have a little tenderness for these images, but there were simply too many of them. Of course, these images had nothing to do with what was called – and still is called – Surrealism, but rather with illustrations of record covers and books of Fantasy and Science Fiction. Admittedly, these images were all different, but finally their style was in fact always the same, so that after having seen twenty of them, one hardly wanted to look at the next 200 images.

The stylistic standardization of all these images was such that it seems to me that the question arose as to whether they were really art or more simply craftsmanship. I have no objection against craftsmanship. Many artists would certainly like to be able to devote themselves to their art full-time, but as it is necessary to live, they work in illustration, design, advertising photos, shop window arrangements, decoration, industrial or commercial catalog photos, posters, etc. When you have worked in Research and Development, you know that what comes out of an R&D laboratory is generally not aesthetically very convincing and you are fully aware that no technical object resulting from R&D arrives in the users' living room without having previously passed through the hands of one or more salaried artists who have worked to make it desirable. Is it really art or more simply an industrial or craft activity?

Networks

It seems impossible to me to understand what is going on with image generators without going a little deeper into the technical aspects. So I will now talk about what I have been able to learn or guess about automatic image generators that rely on what is commonly called Artificial Intelligence. What journalists refer to as *Artificial Intelligence*, or *Algorithms*, or *Deep Learning*, actually corresponds to the use of *formal neural networks*, which are a model of what was known about biological neural networks in 1950s. One of the first formal neural networks that was developed was called the Perceptron (1957), it originally consisted of one single formal neuron, but it was already capable, to a certain extent, of *learning*. Subsequently more advanced formal neural networks containing multiple layers of neurons were developed, which led to the journalistic term "Deep Learning", a term which does not mean that the learning is deep, but that the neural network

formals is deep, in the sense that it is made up of several layers of neurons, much like the brains of most brained animals.

Formal neural networks are able to learn… How is this possible? In fact, in a quite natural way. They have to be presented with a large number of images that are, humanly speaking, considered to be similar, and then, their parameters have to be corrected and adjusted until the results they produce correspond to the type of similarity sought. For example, after being presented with a few tens or hundreds of thousands of images of cats, a formal neural network will have learned what a cat is, in the sense that it will have become able to recognize a cat that it has never seen within an image that he has never seen either. I don't know if that may be called intelligence, but in any case, it corresponds to what is generally called *Perception*. In more technical terms this is also called pattern recognition. Recognizing a cat in an image implies not confusing it with a dog (an ox or a frog, a tree or an armchair) and this type of ability therefore makes it possible to automatically classify shapes. It may be noted in passing that the discipline that deals with perception and forms is called aesthetics. This means that work on formal neural networks was from the outset in the field of art.

However, it must be recognized that the inner workings of formal neural networks remain somewhat mysterious. We know how to build simulations of formal neural networks using computer software, we know how to use these networks and the results they produce, but we do not have a very clear view of how they manage to produce these results. This is the reason why Google undertook to visualize the different stages through which the networks passed before producing their final results. This led to one of the first image generators based on the use of formal neural networks: *DeepDream Generator.*

https://fr.wikipedia.org/wiki/DeepDream.

As Google has made publicly available the source code of the DeepDream Generator software for free, many image generators based on the same or similar principles have quickly appeared and are now constantly being improved.

Let's now come back to learning. Biological or not, learning is based on *repetition*. Which means that nothing and no one can learn from one single radically new image. This would have little biological interest, since what is unique and radically new will most probably not appear again. It is therefore what could be called *an absolute accident* from which there is *a priori* nothing to learn that would be worthwhile in the sense of survival, "natural selection" and biological evolution. The need to have to repeat to learn is well known to us since it is generally by repeating that we try to learn by heart. However, what is less known is that our brain, during our sleep, and therefore *unconsciously*, memorizes our memories in the same way, that is, by repeating our important experiences many times before disseminating their elements in various locations of our brain and our various types. of memory.

But what does "important experiences" mean and from what point of view are they important? This is where an element comes in, that moderates what I said about "absolute accidents" a little earlier: namely emotions. An accident will be remembered, even if it is not expected to ever be repeated, if it has caused us a strong emotion, whether consciously or unconsciously. And this perhaps casts an interesting light on the often dramatic nature of our dreams. However, even if we admit that *our emotions decide for us what is important or not*, it remains to be determined how these emotions are elaborated and why our emotional system functions in a way so finely tuned to the Real and so satisfying, that it has – thus far – enabled our survival.

I will not discuss this point further here for the reason that the emotional characteristics of formal neural networks do not seem – currently – very developed. However, I would also not like the reader to get away with it by considering that the emotions that decide what is important or not are reduced to fear, pain or pleasure. The psychic processes involved are much more complex than that. Thus, when the mathematician Henri Poincaré is surprised that his mathematical unconscious almost always only suggests to him ideas that are relevant to the question he is studying (even if these ideas are not necessarily correct), he concludes that it is is probably because they are associated with sufficiently intense aesthetic emotions (mathematically speaking: some sort of formal beauty). We must therefore admit that things are not only a little more subtle than the little fear-pain-pleasure refrain, but that they *do* have to be so, so that we can get out of trouble in much more complex and rich situations than those processed by our reptilian brain.

The key, for what concerns us here, is to understand that an image generator based on formal neural networks can only learn if it is provided with a sufficiently large set of *similar examples*. In fact, these generators now use several databases of examples, corresponding to different styles of images, in order to be able to offer users the generation of images corresponding to the Fantasy or Surrealism and Science Fiction style, or else in the style of a known artist, or even in the style of a specific historical period. We can therefore see that what the formal neural networks used in these generators capture are *styles*. A few years ago, an experimental image generator was thus quite capable of generating reasonably convincing new Rembrandt.

It follows that artists are threatened by image generators only insofar as the works they produce conform to an identifiable *style*, even if it is their own style. This situation invalidates the proverb that "the style is the man", or the advice that an artist should "find his style" or "cultivate his style". We can much more accurately say that style is precisely what is most mechanical in man, since a formal neural network can relatively easily capture it and use it or imitate it. The irruption of automatic image generators will therefore force artists to go beyond the prison of their own style and to produce more radically new images, more intellectual images, and which best correspond to Leonardo da Vinci's phrase that art is "*cosa mentale*", or Duchamp's categorical refusal to follow the slope of "retinal" images and his instinctive and radical revolt against the expression "dumb as a painter".

The only question that arises with respect to art as with respect to all other intellectual activities is: does it contribute to *the honor of the human mind?* If the work of an artist, taken as a movement of thought, that is, *as a whole*, and not only in its results, does not contribute to the honor of the human mind, then it is probably because it simply is not art ,strictly speaking. Such a work may well be beautiful or touching, it may well please, it may well move the viewer, but in the longer term, it will (or should) probably not appear in the list of great works that have changed the ways of perceiving and thinking of men in the course of history.

The fact that the outputs of image generators based on formal neural networks are often strongly stereotyped results from two things: the style of the images that were used to train these networks on the one hand, and the low aesthetic demands of many users of these networks on the other hand. Because, it should not be mistaken, the user of an image generator remains in control of what he chooses among the many images offered to him by the generator, and he is entirely responsible for his choices. If his choices are somewhat uninteresting, it is not the fault of the generator, but obviously his own. Here as in other areas, some work is required. Recently, an artist won a first prize in a digital image contest with an "automatically" generated image. But he also explained that

he spent more than 80 hours adjusting settings and in the long trial and error process that led to the generation of this image. In other words almost as much as if he had done it in oil and on canvas.

Use and Misuse

The first thing we notice when playing with image generators is that the images they offer can be aesthetically interesting *or not*. When they are generated based on parameters adjusted by a real artist, and then selected by this artist according to the emotion or interest they provoke in him, they are generally convincing, artistically speaking. On the other hand, experience shows that a user without artistic culture or particular aesthetic requirements will probably not get anything worthwhile from an image generator. As the images resulting from the generator *both resemble and do not resemble* what human imaginations are able to produce, the interesting aspect for the artist who plays with the generator is a kind of apprenticeship that relies *on and against* the training of the underlying formal neural network and contributes to *enriching this user's own artistic imagination*. One way or another, this is actually central to everyone, users (talented or not) as well as viewers of the AI generated produced artworks. People on both sides are looking for new visions and the very odd thing is that these new visions sometimes happen to be there. If you consider it well, it's very strange. Why and how do these bloody machines succeed in proposing images that can emotionally move us? Of course we have to select among the images that they produce, but *we* actually do the same. We do not publish everything we make.

Considering that the architecture of currently available generators is often strongly constrained by commercial objectives, the collaboration between the artist and the network stops there, since the artist is not provided the possibility of training a formal neural network on basis of its own requirements and its own choices. Despite the relative wealth of parameter adjustments offered to users by the developers of the image generators, these generators remain subject to the stylistic choices made by their creators (and owners) when building the databases of examples used to train the underlying formal neural networks. Nothing theoretically, nor probably even technically, would prevent artists from building their own bases of examples, thus making the image generators evolve in unforeseen and unpredictable directions. Nothing, except the commercial aims of the creators of image generators. Users with a low level of aesthetic requirements being much more numerous than more rigorous artists, it is obviously the less rigorous ones that are to be addressed in priority if the objective is to earn money.

A second way of using image generators is obviously to use the images they produce within individual or collective compositions such as collages for example. But they obviously just as well be integrated into works made at oil and on canvas. Some have used the terminology of *hybrid* works in this regard. Hybrids? Why would using images from image generators lead to works more hybrid than those made from images extracted from magazines or newspapers? This terminology looks a bit like being rooted in a kind of animist belief according to which there would be at the heart of an image generator a kind of *spirit* animated by bad intentions towards humanity in general and artists in particular. If image generators may seem to "want" to harm their users and all of humanity, this can obviously only come from the bad intentions of their creators, and in no way from the neural networks on which their operation is based. The images produced by image generators are just images like the others and everyone is obviously completely free to use them or not, according to their needs and their projects, just as, for more than a century, painters did not hesitate to use photography as they saw fit.

Another interesting aspect of playing with image generators is *speed*. The images are usually generated relatively quickly, which allows the user to take into account the results he just obtained in order to adjust the parameters of the tool in return, so as to try to make the generator productions converge towards what the user wants, or else towards what he suddenly glimpses on the basis of what the generator has just proposed to him. Such a cycle (open to the unknown if the user is open to *creation*) would be impracticable by other known means, conventional or not. In this loop where the user and the generator respond to each other, it is the artist's mind that evolves the fastest and the most deeply while the generator continues to do what it can.

In another approach, remembering of the "deadly seriousness of machines" criticized and cheerfully subverted by Marcel Duchamp, it can be amusing, and even aesthetically interesting to *misuse* image generators and drive them to generate images, or styles of images, for which they were not designed. Generally speaking, humor, which was at the basis of the avant-gardes of late 19th century and the beginning of the 20th century, seems to have disappeared from the field of artistic experimentation, so that, to the *deadly seriousness of machines* has now been added the counter part of a *deadly seriousness of the artists and their works*. We obviously cannot speak of humor about the works of what is called Contemporary Art which, by whatever end it is approached, is most of the time absolutely lacking any kind of spirit, in every sense of the word, except as regards the business acumen and the perpetual praise that it makes to money. Contemporary Art, as it is lauded and sold, is in fact a modernized version of 19th century Pompier art and distills conformity, sadness and boredom in the same way as did the Pompier art, its true ancestor, although with much less innocence.

In general – and the image generators have nothing to do with it – 21st century art remains absolutely distressingly conformist, both from the point of view of thought and that of works. We cannot blame the art schools for that, as their main function is to train employees necessary for industry and sales, like all the other schools. Nor can we accuse the critics and journalists who, living off the (quite relative) generosity of the Powerful, obviously can only do and say what these Powerful people expect of them. But finally, it is clear that this century – like the end of the previous one – does not really shine by its abuse of the powers of the imagination. However, and although no one seems to tire of so many repetitions, everyone secretly awaits, like the messiah, the arrival of a green youth, who, armed with a furious revolt against so much emptiness and boredom, and, like other youths before her, will come to exclaim: "*You are tired of living in Greek and Roman antiquity*".

It is neither fair nor reasonable to blame our machines. They have always been and remain mirrors to us. Mirrors which faithfully cannot reflect anything other than the sinister reality of our submission to the Capital, accepted as the only imaginable fate, just as a woman's mirror cannot fail in the long run to reveal to her that she has aged. There are obviously other ways out than angrily breaking these importunate mirrors, it is only a matter of thinking and dreaming of these ways out. For this, the acknowledgment of the current misery is not enough. Only an open and unbridled experimentation with all the possibilities offered by the present time can provide for this, because, that is, precisely, *the whole art of art*. So let's thank the image generators for this cruelty by which they reveal our clichés and our styles and ridicule them. Let's step over all that and venture beyond.

Pierre Petiot – 2022-11-03.
(Based on remarks by Evi Moechel and J. Karl Bogartte)

Appendices:

An Architecture of Chance – Une Architecture de Hasards (Book)

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