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# The Possibilities of the Incoherent: A Study on the Human-Machine Interaction Based on Incoherent Fragments of AI images

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Hands seem a tricky element for artificial intelligence to copy; diffusion models for image generation often have conflicts in the execution of the extremities. Considering that artificial intelligence has an incredible performance in the development of visual components, the action that drives the development of this text is to observe these incoherent hands, and ask about which boundaries are being observed? Asking this question leads us to review the function of images, the definition of error, and to understand the extended cognition theory. With the results of an exercise that tries to find patterns of the artificial aesthetics of AI images, this paper reflects from a post-humanist perspective, on the role of incoherence to evaluate its potential role in reformulating the interaction between humans and machines.

**Keywords:** Artificial Aesthetics, Posthumanism, Artificial Intelligence Images, Diffusion Models, Shared Cognition, Error, Potential, Hands.

## 1. Introduction

Humans have developed a close relationship with technology machines, which has made us reliant on their agencies and possibilities. Society establishes power relationships with each other and the surrounding environment, which also happens in the relationship with machines. Even though they are our creations, we have produced a dichotomous relationship with them that goes from the fear of domination to one that encourages collaboration.

Authors like Donna Haraway, Bruno Latour, and others have developed the posthumanism philosophy coined with this name in 1977 by Ihab Hassan (1977). This philosophy, in response to the traditional humanist paradigm, proposes that human and non-human agencies are equally responsible for changes in the world. Notably, Haraway proposes that in a context of ecological devastation, like the one in which we live, a change in the paradigm about the idea of development could create new scenarios to stay with the trouble (Haraway 2016).

> A slightly perverse shift of perspective might better enable us to contest for meanings, as well as for other forms of power and pleasure in technologically mediated societies. (Haraway 1985, 515)

As the author said, humans are not the basis of the development of the world, and to change this cosmovision, we must move our attention to new places that allow us to observe and explore this network of agencies. To rethink our position on this grid, we need to identify antique patterns to reconfigure and open them as a space for creative interaction on this network. This paper tries to do this: think about the potential of the artificial aesthetics to new ways of creativity.

Many objects of study could study technologically mediated societies; one that has been in the media spotlight are the images created by artificial intelligence. Academic researchers, engineers, and civil society are thinking about this. The discussion has been intense in the field of creation. Multiple voices analyse the role, scope, and projection of these images. These can mimic human traces and styles in short periods of production and with high credibility to the human eye (considering credibility as if they look or not as human-made). Public opinion has focused the debate on whether these images will replace the development of images by humans. However, the above point is not argued in this article because this work focuses on the emergent possibility that these images give to revise and modify our relationship with machines.

## 2. Interaction through Images

### 2.1. Artificial Intelligence Images: Nature and Capabilities

In the field of visual content, the most outstanding feature of the current generation of artificial intelligence algorithms for image generation is the quality of the compositions accomplished. Even if we look at surrealist style or hyper-realistic images, they can mimic aesthetics and composition with detail. In some cases, it could be challenging to respond about which is the nature of the image. When this happens, the lack of coherence could be the key to knowing whether a machine produced the image. Recognizing an element in the composition that reveals a failure in the pattern[1] of the image could be informative about what kind of entity creates what is seeing. For apparent reasons, finding an abnormal pattern is easier in hyperrealistic images because the target of the image is quite recognizable; therefore, the point of comparison is less debatable and more comparable. On the other hand, in a surrealistic or abstract image, the search for a divergent pattern on it is more complex since the original point of comparison is more diffuse, as it is an artistic style, not a mode of perception.

Images generated through artificial intelligence are produced by algorithmic processes. Different algorithms can generate images, but the diffusion models in 2022 have the best results and have become more popular. The aim of this study is not technical, but it is necessary to know two things about how these models work to follow the argument presented throughout this paper. Artificial intelligence is a technology aspiring to create machines that mimic human cognitive functions through the training of algorithms. Train an algorithm means executing mathematical processes automatically until its results are optimal. These algorithms are trained to create new images, so they are trained by using extensive digital image databases, which are the object or medium they have as a purpose to optimally reproduce. Thus, an AI image can be declared optimal if it is as close as possible to resembling the set of images on which it was trained.

More than one algorithm uses the diffusion technique to create images. This article studies the stability diffusion algorithm developed by Stability AI studio. The selection criteria are based on four points. First, it is an open-source initiative. Second, it has a software environment called Dreamstudio that allows autonomous users to produce images without interacting with code; Dreamstudio allows image creation by word-to-image process and image-to-image generation, which is the focus function in the context of this article. Third, to train de artificial intelligence model, Stability AI uses the LAION-

1. When it refers to a pattern in the image, it can be either a graphic feature, the colour palette, the trace, or the compositional style of the image.

5B database, which is the most extended, open-access image-text dataset that exists at the moment (LAION-5B). Knowing this allows access to the base material that compounds the AI images, allowing a comparison between the input and output images. Finally, on its website Stability AI declared that they "care deeply about real-world implications and applications" (Stability AI). This declaration is fundamental when the images its algorithm generates are the object of study to explore the relationship between humans and machines in a technologically mediated society.

Current images created by Stability AI have enormous credibility. Even when it comes to hyper-realistic images of humans, images are easy for us to evaluate their coherence since we recognize our anatomy unequivocally and, for biological reasons, quickly locate anomalies in their appearance. Nevertheless, artificial intelligence images commonly fall on a detailed mistake when they try to mimic human images, our extremities: hands and feet. There are many images in which the algorithm correctly reproduces the human anatomy but cannot achieve hands or feet. These extremities appear in impossible positions, divided into fragments, with or without the natural amount of fingers.

Accusing a lack of coherence in the graphical representation of the image, or recognizing image pattern failures, as is named in some paragraphs before, is a concrete action that allows us to find our human position in the network of agencies. We can choose to describe it as an error made by the artificial intelligence algorithm that needs to improve or be more creative. We can examine it as a network node and use it as a medium to explore new ways of interacting with machines and images. This article will examine whether inconsistencies in images generated by artificial intelligence can be an element capable of encouraging new modes of interaction between humans and machines.

### 2.2. About images

Images evolve through time; with the timing of history, they change their style and production way, and consequently, they change as symbolic devices. As John Berger said, "every image embodies a way of seeing" (Berger 2008, 10). Every image crystallises a subjectivity; the features of his time are inscribed on it. We must consider the symbolic characteristics that the author has and trespass to the image being produced; likewise, through the author, the social conventions that come with and condition the author's choices. An excellent example is the relationship between the ideological changes produced in the renaissance era and their visual materialisation in the inclusion of perspective in the image. Perspective represents a shift in the ways of seeing and being that society chooses to inscribe in history. The move to perspective meant a change in the hierarchies that guided the observation of the subjects. Just as before, the observer was an omnipresent god; now, the people possessed an autonomous way of observing (Berger 2008).

However, this could not be possible without technological advances, ones that a philosophical path guided. As mentioned above, with the inclusion of mathematical procedures in the image field, perspective appears and modifies the subject that possesses the observation capacity. Later with photography and the video camera, the time of the image changed, acquiring new abilities to communicate things. Technology has always mediated images; this primarily influences how they can be produced, but as significant as this, it defines how they are experienced and interpreted (Lee 2021). Images are representation and perception devices at the same time. The emergence of artificial aesthetics and its consequent effect on the problematization of the ownership and human nature of creativity (Manovich 2022) is the hallmark of the images of our time.

### 2.3. Shared Ccognition

The study of emerging possibilities in the human perception of AI images must consider the cognition theories that incorporate the "outside" in the cognitive perception process. The extended cognition theory (Chalmers & Clark 1998) allows us to think about the continuous connection that different entities have in participating in a single cognition process, even if they are or are not human. When we think of the effect of the perception of an external stimulus, this outside organism intimately connects with us in a unique cognition process. That can be seen as a "cognitive system in its own right. All the components in the system play an active causal role" (Chalmers & Clark 1998, 8). From this perspective, recognizing a lack of coherence outlines a network's node in which humans and machine agencies meet and constitute a single cognitive act, with the image as a medium. What is the machine's role if every component has a role in the extended cognition process? How to describe it? Try to answer this question and assume that a model of extended cognition exists, has philosophical and moral consequences (Chalmers & Clark 1998) and so does not look at traditional models as a structure that orders how we operate in the world (Haraway 1985).

### 2.4. Meaningless Potential

Trespassing responsibility to new entities in the cognition process causes looking at new spaces to find a new order of ideas. Interacting with others provokes us to get to know them in their own ways. This work defines images generated by artificial intelligence and the details it fails to imitate as the object of study. If we traditionally think of these details, they can be called errors. On the standard definition of error, failure is an indeed performance of something.

At the same time, performance is a program or behaviour that someone puts on a body (human or non-human); it is not an autonomous action, failure is relational (Carroll et al. 2017).

Correct and wrong are words that significantly impact the shape of social development. Comprehending that error is an interpretation of an entity's behaviour unlocks the possibility of rethinking its meaning. Diversifying the meanings of error allows us to modify the current models of order and meaning in detail. If we think about the network mentioned above, rethinking error opens a new horizon of possibility (Berardi 2019) that refreshes and mobilises new ways of connecting and acting in a network. In this case, in conjunction with technology, this happens because reconsidering failure forces us to rethink our gaze on machines and our self-image.

> In a sense, failure is the gap that follows the collapse of one mode of life and precedes the development of a new one. (Carroll et al. 2017, 2)

## 3. Reverse Error Exercise

As AI-generated images are created through a learning process that uses a database of images to create new items that can be considered similar to them, it could be said that an AI image is a sort of infographic or resume from that group of images (Salvaggio 2019). For that reason, sometimes AI images reflect bias or patterns written into the database, such as racial, gender, or LGBT+ issues. It is possible to distinguish ethics concerns by analysing the images resulting from the database. The article does not intend to work with a problem about ethics assumptions, but they come out in different forms. The issue that is studied is not about an ethical bias; it is about social conventions. Knowing the above, in order to study the features of the images generated by artificial intelligence and to recognize possible patterns that would show the artificial aesthetics, was proposed an exercise that would allow the machine to generate images according to its own mechanics, the procedure and some conclusions will be presented in the following paragraphs.

### 3.1. Reverse Error Procedure

This article's process includes an exercise named "reverse error" that was executed using the Stability AI algorithm to know how it performs with the idea of error and respond to the question, "How does the algorithm integrate, handle, or modify the unwanted?". It is already said that "error" has a social meaning. Hence, the initial objective of the exercise was to see what changes the algorithm conducted on images of hands that had certain anatomical deformations, hands that, for a medical standard, were problematic because they had inadequate behaviour. The initial assumption was that the algorithm would fix the anatomical deformations, and some corrections associated with beauty standards could appear on the hands, such as changes in skin tones or the vital state of the skin.

**Figure 1:** Reverse error exercise: procedure and outstanding results.

The procedure of the exercise was simple, consisting of three stages:

1. Search and selection of baseline images
2. Iteration through Dreamstudio
3. Evaluation of the results

### 3.1.1. Stage 1: Search and Selection of Baseline Images

Regarding the first stage, the search for images had an exclusively visual approach. The search was for images of hands with medical complications manifesting in visible anatomical alterations. For this purpose, the search was done using the Google Images platform, looking for photographs of hands showing apparent symptoms of diseases such as arthritis or syndactyly. Understanding that the algorithms for creating images work as a flat medium, without recognizing depths or reading hierarchies, the images selected from the search met the criteria of low contextual noise and low complexity in the gestural pattern. Low contextual noise was identified in those images that included the least amount of context possible; that is, the photograph's focus and the most significant percentage of its composition were destined to show the limb and avoided incorporating contextual references. Therefore, the most optimal image would be the one that shows the hand up to the wrist and with a plain background of a single tone. Due to the low complexity of the gestural pattern, the hand's position was intended to be the least expressive and most iconic possible, that is, in an extended position. Coloured nails, accessories, and tattoos were avoided. There was no selection criterion regarding incorporating a single or a pair of hands in the image.

### 3.1.2. Stage 2: Iteration through Dreamstudio

The rigorous selection of the images was vital for the development of the exercise; however, the core of the procedure is in the execution of the second stage: iteration through Dreamstudio, because in it, the human-machine interaction is manifested. In the initial fragments of the document, the reasons why the Dreamstudio algorithm was selected have already been specified, one of them being the possibility of working with the image-to-image mode. The study's goal is to interact with the machine through images, not words, which is why this stage was implemented using that function.

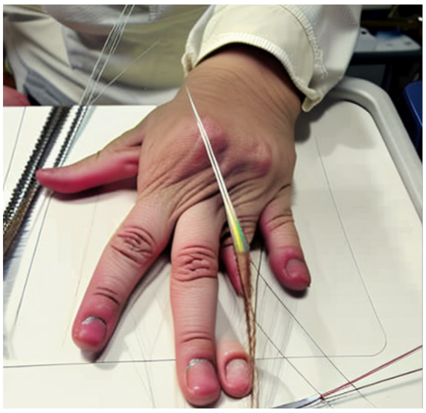

**Figure 2:** Image result of the reverse error exercise.

Textual prompts were not used in initial iterations, but to evaluate the possibility of more diverse images, they were incorporated in subsequent phases. Regarding other definitions for the iteration of the baseline images through the algorithm, the parameters of the image size were kept fixed, which was always requested in a 1:1 ratio and high quality, one image was always generated per batch, and the parameter of the generation steps was always kept fixed at 50. Regarding this last parameter, the platform indicates that the generation steps specify the number of times the image will be displayed and that the more steps, the more accurate the image will be to the description; this parameter was left low as it was the default value, and also, to avoid the request of a more "adequate" image (conflicting adjective according to the guiding concepts of this work).

**Figure 3:** Image result of the reverse error exercise.

Given the initial question driving the execution of this exercise about how the machine works, the concept of error; the argument that images generated by artificial intelligence have bias; and the preconception that the results delivered by the algorithm would evidence modifications to represent standards of beauty, the first phase of the iteration of the baseline images attempted to be as minimally human-driven as possible. For this study, this meant that the image was incorporated into the Dreamstudio interface and iterated without textual prompts. However, after about ten iterations per baseline image, textual prompts were incorporated to guide the development of the images toward modifying the unwanted features of the initial image (unwanted features are identified as the evident signs of the presence of the illness). The following prompts were incorporated in different batches: hand, perfect hand, healthy hand, human hand, perfect human hand, and hand with five fingers.

### 3.1.3. Stage 3: Evaluation of the Results

The third and final step of the "Reverse Error" exercise was to evaluate the results. Initially, the results were sorted according to their baseline image and were categorised according to the most prominent features in the images produced by the algorithm.

The result was a spectrum of images that generally followed the initial assumptions. Most of the features that were modified in the image were those that gave away the age of the person photographed initially. The generated image retains the baseline image's wrinkles and loose skin characteristics in practically none of the results. As for the features that defined the groups in the images, the following can be named: images in which ring-like shapes appeared on the fingers; those that added textures to the skin, some inclined to patterns similar to henna tattoos, and others that were not associated with any identifiable feature since they incorporate tones and textures improper to any natural skin tone or texture; those that modified the appearance of the nails on the hands, some colouring them, others making them grow in size; and the last category were those that seem to have a more significant potential for a non-anthropocentric analysis, which are those in which the fingers grew or decreased in quantity and their anatomical mechanisms were improper for a finger as we know it since they were rotated impossibly, from joints that do not exist.

While the above results were essential and should be studied in more detail, the most relevant conclusion for the present paper is that the anatomical problems were not formally approached by the images, even in some cases, the images became more abstract or meaningless. This last point redirected the article's argument toward discussing shared cognition and meaningless potential. This conclusion made it possible to understand that the mechanisms of the machine representation are logical, and only from its statistical construction originating in a database containing symbolic elements, the images that the algorithm generates also contain symbols by inheritance.

Observing and recognizing patterns without calling the machine's choice of not correcting the anatomical deformations of the hands an error is what opens space for post-humanist thinking. This exercise engenders a process of shared cognition between the human and the machine. Without a database, there is no algorithm; without an algorithm, there is no image; without incoherent features in the image, there is no questioning of the concept of error. Having recognized the above, what remains then is to propose how to continue the chain through creative acts.

### 3.2. Reverse Error Conclusions

The critical element resulting from the reverse error exercise is that these images, which may be indicated as many of them less coherent than the original ones, are well evaluated by the machine, and therefore the algorithm outputs them. The intention for anatomical correctness was part of the human expectations of the machine's performance. Considering images as representation devices displayed as a medium around an extended cognition process, the machine is correct, and the idea of an autonomous agency emerges. Bringing in what Calvino said about the literary machine, going against an order that the original image establishes, a natural characteristic of the machine appears (Calvino 1986). A subversion, a desire for disorder proper to the machine: the self-representation. Which, in any case, does not wait for human validation to exist; it only appears and does not need to justify itself.

For this analysis, it is necessary to return to the procedure the algorithm implemented to produce images. It takes an enormous bunch of images to find patterns and, after, apply mathematical sequences to generate new images. With this in mind, it is possible to argue that the images resulting from the AI have a distinctive representation model, a unique aesthetic with the distinct characteristic of having a sensible and logical register simultaneously. The abstraction of the input images of the database fully charges the output compositions of human symbols, as could be the rings that the algorithm puts into the hands of the reverse error exercise. At the same time, the images have a measure of success that only results from the logic of mathematics that the algorithm inscribed in them.

The act of pointing to something as non-coherence but not as an error is an interaction that constitutes a new cognitive system since it is impossible to decouple human and non-human agents in its conceptualization. This human-machine interaction is powerful because it questions the modes of representation and disobeys the art's paradigm, which is identified as one of the pillars of culture. What is regenerated is the way of being human. The idea that the machine can generate its own images takes out of human hands the idea that we are the only ones capable of producing them. Admit that this could be, come up with the challenge of finding the potential of this new cognitive system. For definitely, its objective cannot be to install these processes as a mere biological extension but as a creative engine.

The potential of the incoherent fragments in the images generated by artificial intelligence is that through an act of shared cognition typical of human-machine interaction, the appearance of the potential of expanding the registers of representation function as a provocation for new ways of doing.

It is beyond the scope and capabilities of this text to propose and test the mechanisms that would enable these new ways of doing. However, it may be revealing to look at the history behind the works in the exhibition "Electronic Abstractions", produced in 1953 by Ben F. Laposky. It exhibited "Oscillons" (Laposky 1953) – the form in which the author decided to name this type of image – a type of photographic manifestation generated from the oscillating geometries that appeared in the cathode ray oscilloscopes. The latter are artifacts widely used at the time to measure different electrical parameters, which allowed the testing of cutting-edge technology in that context, such as televisions and radars. The relevant point of observing this exhibition with the aim of creative projections of the act of observing incoherent fragments in images is that according to what the author manifests in the book catalog of the exhibition, the provocation to make these images was the reading of an article published in the magazine Popular Science Monthly, during December of 1947. The article called “Even Necktie Designers Can Use Electronics” proposes that fabric designers can observe the geometries resulting from electrical variations for inspiration to create new products.

> Ranging from random squiggles to intricate geometrical lacework, the designs offer fascinating possibilities for dresses, scarves, ties and draperies. (Popular Science Monthly 1947, 115)

The idea set out in the Popular Science magazine article, Laposky’s subsequent reading of it, and the following photographic exercise is an excellent and inspiring example of what we might do when looking at the incoherent fragments of artificial intelligence images. As an outline, one could think of these images as inspirational for prosthetic designers, creative painters, screenwriters, or others.

We might think about images as Anwandter talks about poetry:

> The plenitude of poetry does not reside in its potential for action or its concrete consequences, neither in defining identities or filling its emptiness, but in the creation of a gap, a renewing space in which different experiences can converge or be born.[2] (Anwandter 2017, 71).

## 4. Conclusions

This work is focused on observing what an initial point could be pointed as an error. To rethink which are its functions and its possibilities. Recently, images generated by artificial intelligence have evolved to the point of surprising humans with their credibility. However, they usually have problems shaping hands, but why? Instead of finding technical answers to the hand’s shape problem, the development of this work is focused on thinking of this as a space to revise and be creative about human interaction with machines.

Calling something an error, it indicates a failure in the expected performance, so at the same time, this performance is being defined. Consequently, mentioning the shape problem of hands as an error only shows what humans expect from machines; draw the performance mentioned.

2. Translated by the author, from the original: La plenitud de la poesía no radica en su potencial de acción o sus consecuencias concretas, tampoco en definir identidades o colmar sus vacíos, si no en la creación de una brecha, un vacío renovador en que distintas experiencias pueden converger o nacer.

Thinking about incoherence without calling it an error allows formulating -in a less anthropocentric way- the idea of what possibilities the AI image is opening up. The machine brings a new type of image, which is symbolic and, at the same time, logical. It inherits the use of symbols from humans but incorporates an algorithmic and mathematical logic that baffles us. The challenge of this is to resolve new ways to incorporate this into our way of seeing and redrawing the relations displayed on the space.

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