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# Representational Aspects of Artificial Intelligence Generated Images: Semiosis, Self-Referentiality, and Meta-Synthesis

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**Abstract**

This article aims to explore the relationships between the theoretical and conceptual operators of semiosis and self-referentiality, investigating aspects related to the representational dynamics of images generated by artificial intelligence (AI). The work begins with the ambivalent relationship between the image as a criterion of truth and the recognition of its possibilities for manipulation to problematise how emerging aspects of contemporary media logic strain the supposed objectivity of technical images. In this sense, through its own conceptual vocabulary, it aims to characterise synthetic images (generated by AI) as metastases. This proposal is based on an analysis of the representational processes involved in the creation and circulation of AI-generated images, examining the dimensions of prediction, self-referentiality, and meta-synthesis. Thus, the article discusses the specificities of representation and records of reality in technical images, deals with AI-generated images through prediction and their representational status, and characterises them based on the notions of "self-referentiality" and "meta-synthesis" in semiotic networks. In conclusion, the work considers that the imagistic metastases of AI-generated images strain the logical place of representation of the real, which is thus distanced, extended, and traversed by radical mediations and profound mediatisations. Likewise, AI-generated images create self-referential semiosis plots that are statistically predictable and probable, like other previous technical images.

**Keywords**
self-referentiality, technical images, artificial intelligence, meta-synthetic, semiosis

# Aspectos Representacionais das Imagens Geradas por Inteligência Artificial: Semiose, Autorreferencialidade e Metassíntese

**Resumo**

Este artigo busca desenvolver relações entre os operadores teórico-conceituais semiose e autorreferencialidade para investigar os aspectos vinculados às dinâmicas representacionais de imagens geradas por inteligência artificial (IA). O trabalho parte da relação ambivalente entre a imagem como critério de verdade e o reconhecimento das possibilidades de sua manipulação para problematizar como aspectos emergentes das lógicas midiáticas contemporâneas tensionam a suposta objetividade das imagens técnicas. Nesse sentido, por meio de vocabulário conceitual próprio, visa caracterizar as imagens sintéticas (geradas por IA) como metástases. Essa proposta baseia-se na análise dos processos representacionais de criação e circulação de imagens IA conforme as dimensões da predição, autorreferencialidade e metassíntese. Assim, o artigo discute as especificidades de representação e de registros do real das imagens técnicas, trata das imagens IA pela via da predição e de seu estatuto representacional, e as caracteriza com base nas noções de "autorreferencialidade" e "metassíntese" em redes semiósicas. Em conclusão, o trabalho considera que as metástases imagéticas das imagens geradas por IA tensionam o lugar lógico de representação do real, que é assim distanciado, estendido e atravessado por mediações radicais e midiatizações profundas. Igualmente, as imagens geradas por IA criam tramas de semiose autorreferenciadas que são estatisticamente previsíveis e prováveis, como as outras imagens técnicas anteriores.

**Palavras-chave**
autorreferencialidade, imagens técnicas, inteligência artificial, metassíntese, semiose

## 1. Introduction

We can understand imagination as the ability to produce images. According to Flusser (2014), the origin of this "complicated and mysterious" gesture required human beings to "crawl inside themselves, look out from there, fix what was seen, use a stone wall with the support of memory, and thus fix what was seen so that others could decipher it" (p. 125). As Machado (1984) states, it is through images that the imagination of this rational, and therefore thinking, being takes shape. The externalisation of images from the subjective world constitutes a stage in the so-called "escalation of abstraction" proposed by Flusser (2014), in which vision is symbolically encoded so that we can orient ourselves in the objective world and enable others to decipher it as well.

Before externalising them, however, human beings forge concepts within themselves, as they do not possess a device that can project them. Thus, according to Dubois (2004), every image requires a technology that needs instruments (rules, procedures, materials, constructions, parts) and a functioning (process, dynamics, action, agency, play). The image, then, according to Machado (1984), presupposes a technical mediation that simulates something to which one does not have direct access. The technique will enable human beings to interact with the world and dominate it, as it is through this

technique that the world becomes an object. There is, therefore, a technical mediation that operates a symbolic mediation.

The objectivity of images was linked to the capture of the "real" and its fixation in the image through the technical device used (the human eye and the hand in drawing or painting; photographic and cinematographic cameras). The invention of perspective and various techniques for projecting images onto dimensional planes pursued this ideal of objectivity, culminating in the invention of the camera, a paradigmatic device for the technical reproduction of images. This type of image, however, differs from the traditional image in that its creation involves encodings embedded in a device that is opaque to its operator. "Photographs are therefore not objective images. First, because they encode their meaning exactly like other types of images; second, because, unlike traditional images, they can still manipulate their meaning" (Flusser, 2014, p. 216).

In our current context, another type of technical image is gaining prominence: images generated by artificial intelligence (AI). Such synthetic images, unlike these media outlines, no longer have a referent anchored in the "real" and begin to generate images based on databases used for learning and training in neural nets. In this model, the referent becomes the "second-hand" images themselves, created based on representations in the databases.

Thus, we can observe an articulation according to the perspective of metalanguage, which, in the case of AI-generated images, operates as a kind of image arrangement generated by placing one mirror in front of another (a process called "infinite mirror"), whose self-reproduction tends to infinity, like the process of semiosis. By self-referencing, AI-generated images replicate themselves and, in this process, distort previously copied elements, which in turn serve as a database for generating new images. At the same time, there is a distortion but also an adjustment, with the aim of updating and improving AI systems, which aim to minimise deviations and errors. To name this process of image duplication and multiplication, like one mirror facing another, we have chosen the term "image metastases", with audiovisual reference to the film *The Substance* (Coralie Fargeat, 2024).

In this film[1], a renowned presenter of a television aerobics programme is fired by her boss because her body no longer meets the "standards" of an aesthetically pleasing body for her age (Figure 1). In her despair, a laboratory offers her a substance that promises to transform her into an improved version of herself. Upon applying the substance to her body, the presenter expels from herself a double, perfected, younger, and full of collagen. Each part has a lifespan of one week, so it is necessary to apply the substance to the other at the end of that period. The double rebels and extends the seven days for renewal. The result is the excessive introduction of the substance into the body, which leads to a monstrous double, with body parts displaced and no longer in their proper places.

[1] The film serves as a free reference for this article in order to elucidate the image duplications operated by artificial intelligence. In view of this, it is not a film analysis but rather an inspiration for the conceptual and methodological proposition.

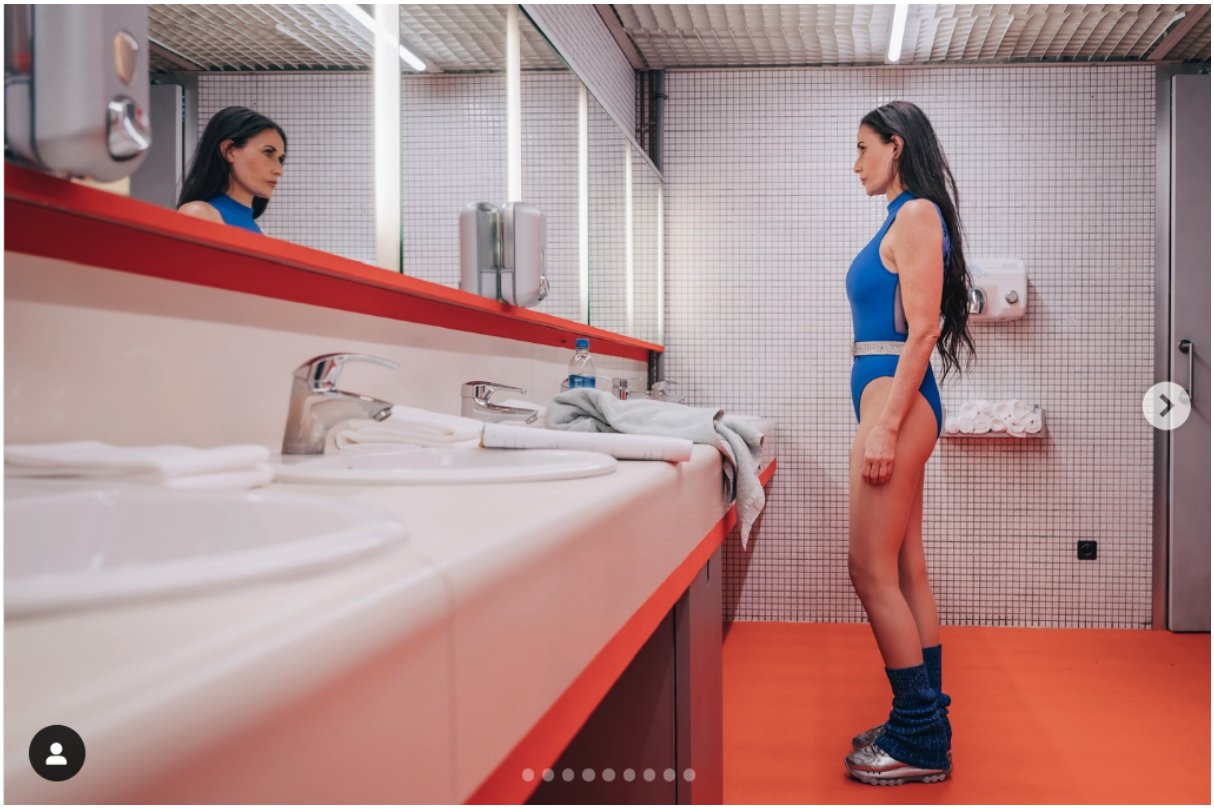

**Figure 1.** *Character from the film* The Substance *facing the mirror*

*Source*. Retrieved from The Substance *is officially in theaters today! So grateful for this film we made and honored to put it out into the world. Proceed with caution and enjoy* [Photograph], by Demi Moore [@demimoore], 2024, Instagram. (https://www.instagram.com/p/DAJVarrOtwd/#)

Inspired by the process presented in the film, we understand that AI-generated image references can duplicate themselves *ad nauseam*, potentially generating monstrosities, errors, flaws, and hallucinations (when AI returns a "made-up" result that differs from the training database). That is the case with the project *This Person Does Not Exist* (https://thispersondoesnotexist.com/), a generator of realistic images of faces of people "who do not exist" based on generative AI technology (Karras et al., 2019). The project was built on an algorithmic model known as generative adversarial networks and used a database of about 70,000 images extracted from the Flickr platform (https://flickr.com/). Each time the project page is reloaded, a "new" face is generated, merging facial features from thousands of other faces to create a seemingly unique expression. However, it is interesting to note that after a few repetitions, the image generator can create distorted and monstrous images of faces, especially when attempting to reproduce faces on the sides of the image, as shown in Figure 2 and Figure 3. Another recurring deformity in AI-generated images is noticeable in people's hands, which often appear distorted or with six fingers (Gomes, 2024; Tunholi, 2023).

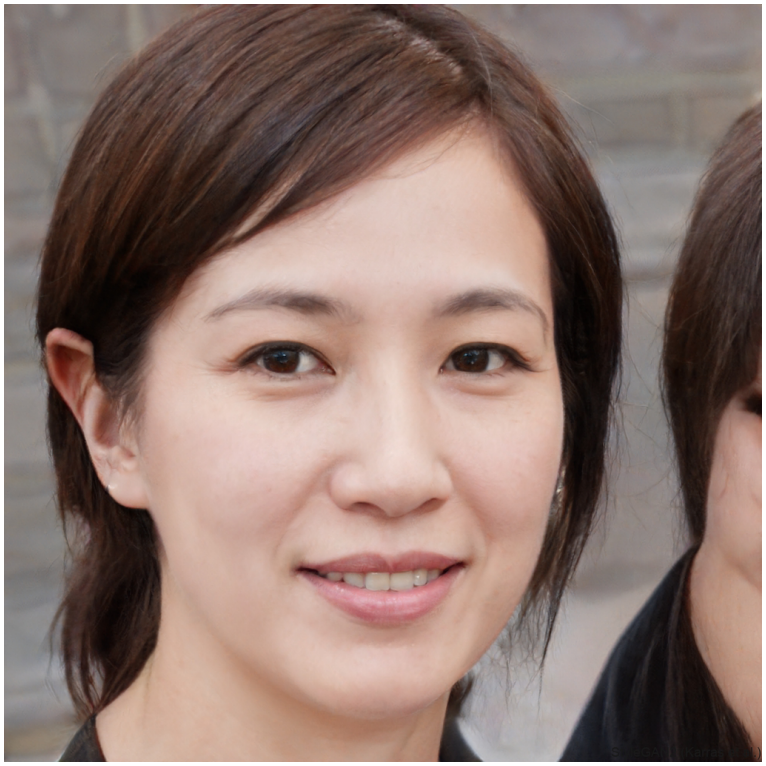

**Figure 2.** *The face of a woman generated by artificial intelligence, with distortion on the right*
*Credits. This Person Does Not Exist* project

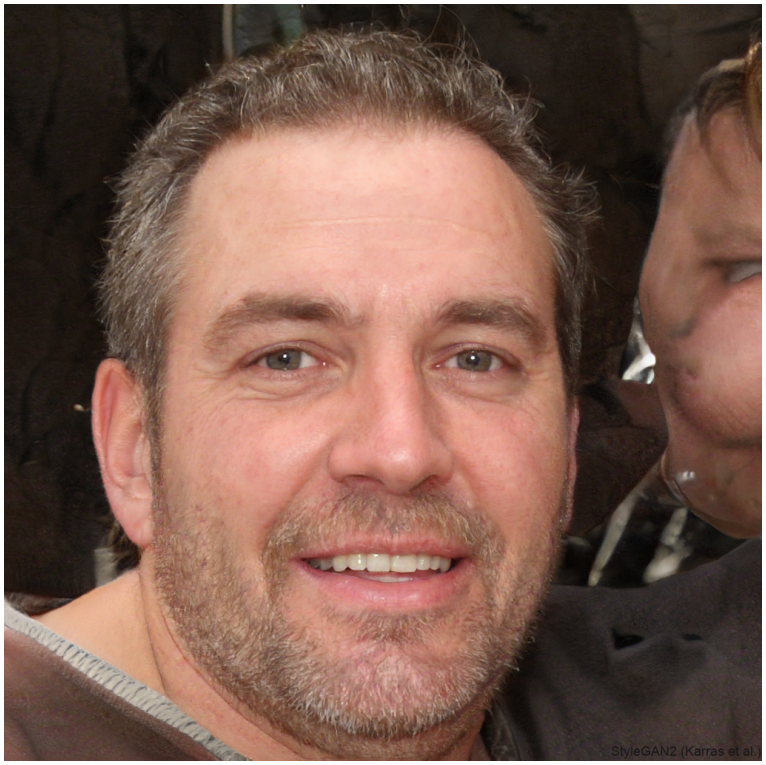


**Figure 3.** *The face of a man generated by artificial intelligence, with distortion on the right*
*Credits. This Person Does Not Exist* project

Against the backdrop of the tension between criteria of truth and objectivity in images within contemporary media logic and learning network dynamics, we pose the following question: what would be the representational status of images generated by AI? We start from the premise that AI-generated image synthesis occurs according to varied dynamics of representation records in data flows, driven by representation, evaluation and optimisation (Berry, 2017). These dynamics constitute network learning and unfold iteratively in several dimensions based on their self-reference to databases in motion.

AI-generated images utilise databases as references and, therefore, tend to stray from their connection to reality, as a synthetic image — that is, one generated by AI — becomes the reference for new training, loosening its ties to reality. Their applications in media flow contexts (generation by prompts and circulation on online social networks) ultimately result in multiple copies and distorted recreations that border on the grotesque, as was the case with the use of the "substance" in the film. Thus, this theoretical essay is characterised by an exploratory, reflective and argumentative approach that seeks to deepen the understanding of synthetic images based on the notions of "self-referentiality" and "semiosis". In view of this, it critically analyses theoretical sources. It brings them into tension in its own argument by proposing that AI-generated images characterise processes of "metastasis", thus constituting meta-synthetic images — images that duplicate themselves.

This occurs because AI image generation involves the mobilisation of different representations, including data structures and algorithmic flows, that generate new representations through the evaluation and optimisation of network learning. We highlight the dimension of prediction in AI-generated images, which differs from the representation of AI in other technical images and their devices. The creation of AI-generated images triggers other developments in image synthesis, as not only the representations of data structures but also the flows that generate the intermediate representations of the learning network must be considered. As a result, the representation of data involves more stable digital materialities, such as structures, and other more fluid ones, such as data flows.

Amid these movements, intermediate representations expand but never lose the determination of the database object, the self-referential dimension that differentiates AI-generated images from other technical images. The change of place or transfer of the anchorage of the real, outlined by generative media, is discussed as imagistic metastases linked to meta-synthesis. The first topic explores the specificities of representation and the recording of reality in technical images. The second deals with AI-generated images through prediction and their representational status. The third characterises them based on the notions of "self-referentiality" and "meta-synthetic" in semiotic networks.

## 2. Reproducibility and Objectivity of Technical Images: Representation and Recording of Reality

The introduction of technical devices for reproducing images was one of the themes highlighted by Walter Benjamin in the 1930s in his famous article, "Magic and Technique, Art and Politics: Essays on Literature and Cultural History". Benjamin (2012) warned of profound changes in the status of art with the emergence of photography and cinema, freeing it "from its obsession with similarity" (Bazin, 1958/2014, p. 30). Once cameras became highly efficient at mimicking the world in a two-dimensional plane, it was then up to artists to elicit other perspectives and visions of reality, transforming art into an instrument of emancipation and political critique.

Benjamin's (2012) reflections on technical images developed almost a century ago still resonate in an inspiring way today, as AI emerges as an increasingly exciting technology for aesthetic expression. In the context of the popularisation of mass media, Benjamin (2012) wondered whether "the invention of photography had not altered the very nature of art" (p. 191). According to this thinker, human perception was also changing due to the acceleration of image reproduction techniques, specifically cinema and photography.

As we know, there has been no total abandonment of previous matrices. Benjamin (2012) points out that "if the illustrated newspaper was already virtually contained in lithography, the talking cinema was virtually contained in photography" (p. 181). In other words, we can infer that AI-generated images encapsulate the logic of traditional photography and evoke questions that have already been raised in its "analogue" form. Hence, the relevance of revisiting authors who are references in the study of technical images and photography.

Critical reflections on images produced by technical devices also draw on the thinking of Vilém Flusser (2008, 1983/2011a, 2011b). Inspired by Benjamin, Flusser elaborates on the concept of "technical images" in contrast to traditional images. According to Flusser (1983/2011a), the process of creating technical images no longer originates from a human gesture (such as the painter's hand on the canvas) but rather from algorithmic processes embedded in a black box. In this sense, contemporary images result from input and output processes operated by an employee who manipulates a few variables of this device without knowing its internal mechanisms. The invention of photography inaugurated the emblematic model of this new paradigm of images, as Machado (2005) argues: "it is with photography, therefore, that a new paradigm in human culture begins, based on the automation of the production, distribution and consumption of information" (p. 74).

Like Benjamin, Flusser also problematises the changes in perception demanded by this other type of image. The reading of technical images, projected onto surfaces that conceal calculations, requires a different thought structure from the one we are accustomed to (Ribeiro, 2020). Against the threat of alienation caused by these opaque devices and towards the emancipation of thought programmed by technical images, Flusser (2011b) proposes the development of a new faculty called "techno-imagination": "the ability to decipher techno-images. This ability has to do with formal thinking, as it is established in computer science, cybernetics and game theory" (p. 120). In this sense, this author calls

on us to recover a critical reading skill of images, which has been subjugated by linear thinking, typical of written code.

Another critical point in the contemporary scenario is the use of AI-generated images as objective evidence to attest to the reality of facts, which can foster processes of disinformation (Ribeiro et al., 2023). This refers to the supposed objectivity of technical images. As Machado (2015) reminds us, a series of scientific improvements in the production of technical images over the last five centuries has fostered the invention of mechanisms aimed at the "automatic reproduction of the visible world", claiming for themselves "the power to duplicate the world with the cold neutrality of their formal procedures" (p. 13).

The mechanisms of technical image reproduction consolidated this proposal of supposed objectivity of the image record, transferring the power of image generation from human hands to machines. The photographic apparatus, equipped with objective lenses and a light-sensitive screen, would fulfil the role of capturing reality as it presented itself to the photographer's eyes, a kind of eyewitness to the truth. According to André Bazin (1958/2014), a researcher of the ontology of the photographic image, "the objectivity of photography gives it a power of credibility absent in any pictorial work" (p. 32).

However, what happens is that this device is a symbolic machine, a coded artefact for generating images that reproduce a certain worldview. In other words, "cameras construct representations, as is the case in any symbolic system" (Machado, 2015, p. 14). The difference is that technical images enjoy the "prestige of an essential or 'ontological' objectivity" (p. 13), which would dispense with the interpreter's need to understand the coding system that originated them.

In the case of AI-generated images, there would no longer be a capture of reality but rather its simulation. In other words, it is the algorithmic fabrication of a supposed reality through the signifying arrangement of images that previously captured reality and now serve as a reference for generating other images. This process begins to operate through imagistic metastasis, as the synthetic image now serves as a reference for other images, which in turn serve as references for other images — a self-duplication and self-referentiality.

The question of the supposed objectivity of technical images evokes concepts from Peirce's (1931–1958) semiotics that were developed in his theory of signs. We cite the elementary notions of "sign", "object", and "interpretant", as well as the classificatory trichotomies (CP 2.243[2]) derived from this triadic relationship, which includes the categories of iconicity, indexicality, and symbolism, among others. The mediating character of the sign presupposes that our access to objects in the world (journalistic facts, for example) will always be through signs that are, by nature, incapable of representing the object in its entirety.

In this sense, by definition, there would be no full objectivity in images and photographic records, given the partial nature of their sign function. Photography will always

[2] The abbreviation CP refers to Peirce's (1931–1958) *Collected Papers*. The number next to it indicates the volume, followed by the corresponding paragraph.

be a two-dimensional snapshot of reality, which undergoes framing, treatment, and processing within a given spatial and temporal context. The apparent objectivity of the technical image, inaugurated by photography, refers to its indexical property, which concerns the way in which certain signs are directly affected by their objects, establishing a causal and temporal connection of cause and effect (Peirce, 1931–1958; CP 2.248). By capturing light rays and projecting them onto a photosensitive screen, photography maintains a temporal and causal connection with the photographed scene, even if this record is subject to encoding and processing. On the other hand, the fact that these images are the result of symbolic processing internal to the device (black box) implies that photography has undergone encoding procedures, whose cultural heritage refers to perspective image construction techniques from the Renaissance context (Machado, 2015). In other words, there would be no "natural" way of capturing reality, but rather a type of symbolic processing, a technical mediation.

Photography, which emerged after painting, derives its originality, according to Bazin (as cited by Dubois, 2004), from its objectivity, which lends credibility to the photograph. It is through photography that nothing stands between the initial object and its representation. It is experienced in the absence of human presence through the replacement of human mediation; that is, this image-generating machine enables the automatic inscription of the image, the automated capture of the "real", and the apprehension of an event. "In other words, the image originated from the reality itself and not from the artist's imagination" (Machado, 1984, p. 11). Thus, it has an indexical character in that the image is traversed and marked by the object. The movement of photography lies in the blurring of the image, which indicates that an event has passed through it.

Thus, it is worth discussing the status that technical images have acquired as "faithful representations of reality", updating these reflections to the context of computational images. This issue has direct implications for the problem of disinformation: our observations indicate an intense circulation of photographic records in disinformation networks as "irrefutable evidence" of reality, but which, in fact, serve to reinforce beliefs that are pleasing to reason (Ribeiro et al., 2023).

The ability to create convincing deepfakes of celebrities also refers to the so-called "mummy" effect described by Bazin (1958/2014), that is, the attempt to "artificially fix the carnal appearances of the being", which implies the "creation of an ideal universe in the image of the real, endowed with an autonomous temporal destiny" (pp. 27–28; Figure 4 and Figure 5). At this point, Baitello (2012) reminds us of the Latin etymology of the word "image": *imago*, meaning "death mask", a particularly intriguing reference when considering examples of AI-driven celebrity recreation or rejuvenation in both film and advertising.

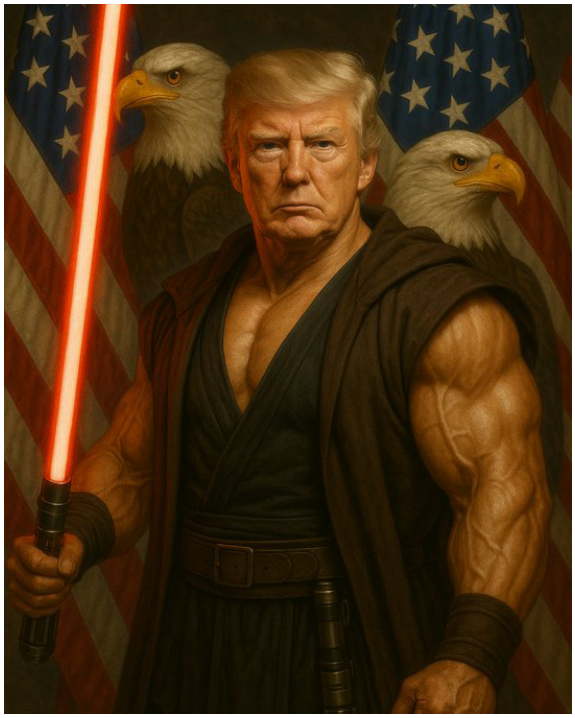

**Figure 4.** *Deepfake of United States President Donald Trump as a Jedi hero*

*Source*. Retrieved from *Happy May the 4th to all, including the radical left lunatics who are fighting so hard to to bring Sith Lords, murderers, drug lords, dangerous prisoners, & well known MS-13 gang members, back into our galaxy. you're not the rebellion—you're the Empire*, by The White House [@WhiteHouse], 2025b, X. (https://x.com/WhiteHouse/status/1919053040734072844)

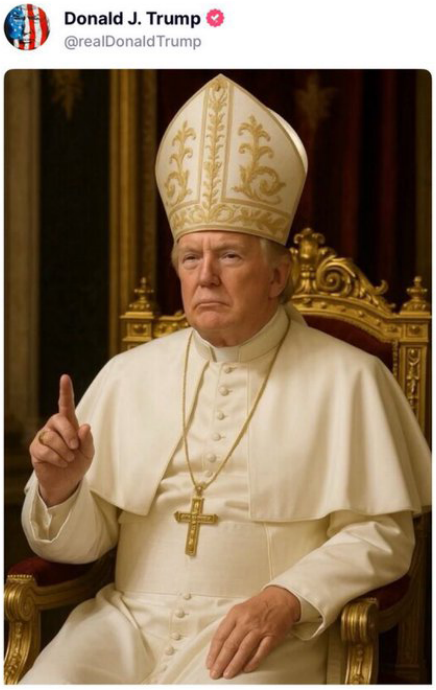


**Figure 5.** *Deepfake of United States President Donald Trump as the Pope*

*Source*. Retrieved from The White House [@WhiteHouse], 2025a, X. (https://x.com/WhiteHouse/status/1918502592335724809)

The specificity of AI-generated technical images lies in their digital dimension, that is, they are synthetic or digital images with binary representation (0 and 1), as well as in the generative capacity of these "intelligent machines". The computer image, therefore, also called a "synthetic image", "digital image", or "virtual image", "takes up the others at their point of origin, not of reproduction, but of conception" (Dubois, 2004, p. 47). With this type of image, the "real" may cease to be the primary referent as the machine itself can synthesise it. Analogy and indexicality fade away, or rather, they are other processes of analogy and indexicality, now anchored in the databases used for AI training.

It should be noted that using a "second-hand" referent is not new to AI; on the contrary, it is a natural condition of every sign when we think of chains of semiosis. A documentary that uses news clippings and excerpts from other videos, for example, follows the same logic and presents itself as a sign that points to other "second-hand" signs. A news report based on people's testimonies is also a sign whose referent is another sign, given that a witness's testimony is not the fact itself. In view of this, according to the logic of semiosis, the dynamic (real) object is very difficult to achieve in its pure form. This is due to the incidence of technical mediation, which alters and adds layers of meaning in the rearrangement of signs. In the case of AI-generated images, the process involves translating text to image or audio to image based on the commands triggered (prompts).

In this sense, these synthetic or generative media (Manovich, 2024) produce synthetic images, that is, images that do not exist *a priori* with referentiality to reality. This is what differentiates these synthetic images from others, such as those in advertising, which often edit a digital photograph and insert other elements. Due to their digital quality and, therefore, non-digitised nature, in the sense of migrating what was analogue to the digital condition (Rogers, 2016), synthetic images are generated and not just edited or processed by algorithmic processes. As Manovich (2024) explains, "the terms 'generative media', 'synthetic media' or 'generative AI' refer to the process of synthesising media objects with artificial neural nets" (p. 8). Examples of such objects include text, voice, music, 3D models, data sets and computer code.

Furthermore, images generated by synthetic media, such as those produced by AI, are also meta-synthetic or self-referential. This means considering that training images for machine learning are also based on other images that AI has already generated. In this sense, a synthetic image serves to create another synthetic image. This process resembles the idea of *mise en abyme* or "Droste effect", in a kind of narrative within a narrative, which can be found in artistic representations such as painting, cinema and literature. The term "Droste effect" refers to the label on a cocoa tin from the Dutch brand Droste, illustrated by Jan (Johannes) Misset. In the illustration (Figure 6), a woman holds two objects with smaller images of herself holding the same objects, and so on recursively (Casadei, 2012).

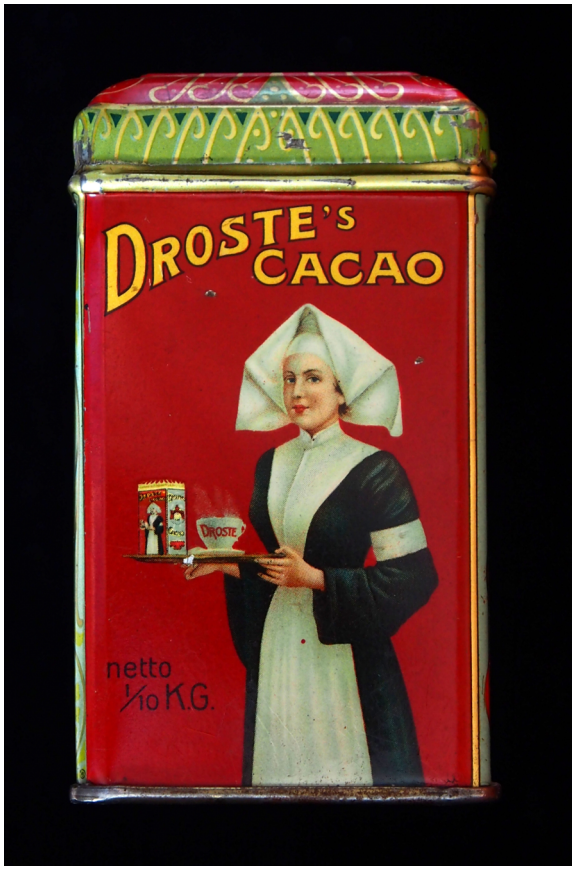


**Figure 6.** *Droste effect*

*Credits.* Jan Misset, 1904
(https://pt.wikipedia.org/wiki/Droste#/media/Ficheiro:Droste_cacao_100gr_blikje,_foto_02.JPG)

From this perspective, the "electronic image" is never visible as an image but merely a process, a "simple" electrical impulse, a numerical matrix, and an abstraction because it is a calculation, as Dubois (2004) argues. Thus, it serves only to circulate within media flows. To be seen, it needs to be updated on a material medium. As the author points out, "[it is] the triumph of simulation, in which the impression of reality gives way to the impression of presence, and the user experiences the simulation as real" (Dubois, 2004, p. 66).

It should be emphasised that technique does not determine the poetics of the image. "When talking about images, it is impossible to think about aesthetics independently of technical intervention" (Machado, 1984, p. 9). Therefore, the aesthetics of the image are directly related to the technique used and its symbolic mediation procedures; technological advances guide every aesthetic and political change in the field of images. However, this advancement does not indicate that one technical image surpasses another but rather that the technique is incorporated into the next technical image and the next generation of techniques.

## 3. Artificial Intelligence-generated Images: Prediction and Learning in Representational Dynamics

Neither artificial nor intelligent. This is how Crawford (2021) and Pasquinelli and Joler (2021) describe AI and question the notions surrounding the concepts of "intelligence", "artificiality", "learning", and "knowledge" in computational terms. Beyond comparisons that limit the definitions of natural and artificial, the debate surrounding AI must address the fundamental concepts that represent human mental processes such as "thinking", "learning", "cognition", and "perception". In this context, Pasquinelli and Joler (2021) question the mystifications of AI, specifically its technical definitions of "intelligence" and "autonomy".

According to these authors, AI has gone from a project to mechanise human reasoning to a regime of knowledge extractivism and epistemic colonialism. Pasquinelli and Joler (2021) aim to secularise AI in order to review its ideological status and understand it as an instrument of knowledge rather than a manifestation of intelligence. This approach is supported by the notion of "nooscope", which, like the telescope or microscope, constitutes an instrument of measurement and perception in socio-technical networks.

The nooscope map considers machine learning as a tool for expanding knowledge, enabling the perception of resources, correlations, and patterns in vast data spaces that extend beyond human reach. Pasquinelli and Joler (2021) argue that the dynamics unfolded by these instruments, such as AI, are not new in the history of science or technology. The telescope and microscope in astronomy and medicine are cited as examples of these socio-technical arrangements. The nooscope is an instrument for seeing and navigating the space of knowledge. As an instrument of amplification, it diffracts and distorts information flows. Due to the rationality of diffracted contexts, in big data contexts, an episteme of causality is replaced by one of automated correlations that often takes the form of a statistical illusion.

Machine learning consists of an object to be observed (training dataset), an observation instrument (learning algorithm), and a final representation (statistical model). This system works by capturing abstract forms of data input, identifying key characteristics or patterns, and storing them for comparison and classification of other data flows or future objects. This capacity enables a form of additional agency, which allows for the creation of different algorithms. These algorithms can build models that associate data with new functions, thereby transforming them. Thus, without being explicitly programmed to do so, algorithms learn from data and transform their agency, being able to self-position and generate models and data structures that internalise certain characteristics and patterns without the need to be translated into formal data structures (Berry, 2017).

Machine learning, according to Berry (2017), is related to the system's goal of learning to create a function that transforms input data into an output, thereby creating local generalisation as opposed to abstract generalisation. The author views machine learning as a medium and presents two concepts and their interaction as the basis for his proposal for a media constitution. According to the author, the two concepts refer to two distinct

components of machine learning systems: one of generative computing — *compute-computing* (computing as generative), understood as the "active" learning component of a system — and one of computed computing — *compute-computed* (computing as generated), understood as the "passive", or inscribed aspect of a system.

Berry (2017) proposes that machine learning algorithms have three main aspects that need to be implemented in system development: representation, evaluation, and optimisation. Knowledge representation refers to the implementation of a knowledge model using representations such as decision trees, rule sets, graphical models, neural nets, and others; evaluation relates to the training to which machine learning systems are subjected based on techniques such as accuracy, prediction, and recall, among others; and optimisation refers to the methods that unfold from the evaluations and their results.

According to Berry (2017), neural net systems work by taking a given input A and translating it into B through intermediate, sometimes called "hidden" layers of neural nets. Traditional computer systems are generally procedural (or imperative); a program starts at the first line of code, executes it, and proceeds to the next, following the instructions in a linear fashion. A true neural network does not necessarily follow a linear path. Instead, information is processed collectively and in parallel through a network of nodes.

This structure enables the network to learn to identify similarities and associate training data and completely new data by comparing them, fulfilling the fundamental goal of generalising beyond the examples in the training set. As stated by Berry (2017), machine learning is essentially an inductive process based on the original empirical training data fed into the network inputs and carefully reinforced so that the network pattern matching achieves the desired aims. This is why learning systems are very competent for classification, as the network's objective is to decide which set of categories (defined by the output units) a given input belongs to.

The learning dynamics thus operate through the representation of data in structures and through other representations generated in the evaluation and optimisation flows. Based on the definitions of machine learning in these computational parameters, we aim to understand, through the semiotic model, the nature of this process, particularly its representation dynamics linked to learning from a pragmatist perspective, as outlined by Charles S. Peirce (Santaella, 2004).

## 4. Artificial Intelligence Generated Images: Self-reference, Metastasis and Semiotics

De Tienne (2007) identifies learning as a semiotic process. In this sense, the author highlights the unity between thought and sign in the Peircean conception, since every mental process occurs through signs, in a continuous movement of unfolding from one sign to another in infinite chains that refer to the preceding sign-thought and include the possibility of evolving into another sign-thought that succeeds it. De Tienne (2007) examines Peirce's assertions about learning, including its essential relationship

with the flow of time, its continuity, the virtuality of reasoning and representation, and the concept of "thirdness", the third of Peirce's categories.

A process constitutes a continuous sequence of events, which guarantees its internal order and differentiates it from other methods. Each event is a distinct moment within the process, presenting sufficient relational aspects to be identified as part of it. Future events operate as general possibilities, and present events are final causes that indicate defined trends. De Tienne (2007) considers that, like Peircean pragmatism, learning should be viewed as a property that develops over time, depending on the apprehension of the general trend as well as the creative implementation that is continually updated. The dimension of virtuality defines learning as reasoning virtually since reasoning is the process of passing from one belief to another. Learning as representation implies, according to De Tienne (2007), the activity of obtaining interpretants and preserving them so that they continue to transmit meaning. As an equivalent, the interpretant sign retains the agency of not being identical but is capable of exercising, by acquired authority, the transmission of the elements that determined it. This is because:

> the interpretant must (1) admit the receipt of the form originating in the dynamic object, (2) recognise that this form, as received, has assumed a certain representational form forced (upon it) by the mediation of the sign, and (3) add to that form a sign of recognition, that is, to know that the form, as received, is not foreign to the interpretant, but, on the contrary, already familiar to it in one way or another. (De Tienne, 2007, p. 87)

This acquired competence ensures the continuity of the semiotic process since once the interpretant is generated, a new sign is also generated that is capable of initiating a semiotic process, thus delineating new related chains. In the dynamics of AI representation, we highlight the layer of statistical prediction, which we aim to relate to the perspectives of meta-synthesis and self-referentiality.

From the perspective of learning as representation, according to De Tienne (2007), it is considered that in this movement of generating multiple and overlapping representations of meta-synthetic, the interpretants linked to the creation and circulation of AI-generated images connect to the dynamic object, admitting it, recognising it (through the mediation of the sign) as a representational form, and add a new sign to it based on this recognition. All these sign processes occur in intersemiotic translations between command prompts in written verbal language and generated images and are repeated iteratively in both directions of translation. Thus, imagistic metastases result from varied representational overlaps and replications that self-reference through the determination of their databases, continuously increasing them. Therefore, imagetic content should not be observed in isolation but also in its primary circulation processes to reveal the representational aspects of images generated in the interstices of meta-syntheses involving learning networks and AI.

## 5. Final Considerations

The word "metastasis" has Greek origins (*metastasis*), which etymologically means *meta* — different; *stasis* — situation, position. In this sense, the image metastases of AI-generated images strain the logical place of representation of the real, which is thus distanced, extended, and traversed by profound mediations when compared to analogue photography and its image status. Although we can recognise the validity of discussions about radical mediations (Grusin, 2015) and deep mediatisations (Hepp, 2019) and their contributions to analysing imagetic statuses in different media logics and environments, we seek to link this understanding of metastases, circumscribed to the dimensions of their own self-referentiality, to meta-synthetic as a relational process. Imagetic metastases and meta-synthetics are, therefore, things and processes in a semiotic arrangement.

As AI-generated images multiply disorderly through self-referential processes of this nature, their artistic potential can be limited and biased. Since their synthesis depends on recreating patterns fed by pre-existing databases, artists and designers are limited to manipulating textual prompts (in the case of AI tools based on large language models) to experiment with variations or test generative possibilities. Furthermore, we cannot overlook the already widely recognised issues of racial, class, and gender diversity deficits inherent in current generative AI models (D'Ignazio & Klein, 2020; Silva, 2022).

The authors of the computational model used in the *This Person Does Not Exist* project themselves point out that the images extracted to train the algorithm have licences that allow their use and reproduction, "inheriting all the biases of that website" (Karras et al., 2019, p. 8). So, beyond the restriction of ethnic diversity in the creation of faces contaminated by the database, this project raises questions about the very origin of the portraits, recreating people who look real through the recombination of common facial expressions. On the one hand, traditional portraits were characterised, according to Benjamin (2012), by the "genre most cultivated by photographers" (p. 109) due to a search for the lost aura, a "singular web of space and time: the unique appearance of a distance, however close it may be" (p. 108). On the other hand, faces "that do not exist" seek anonymity and generalisation by moving away from this idea of individuality in traditional portraits, as they are based on a computational abstraction that attempts to convince us of their apparent (but ephemeral) existence. Thus, through the combination of common expressions, the faces generated are both familiar and non-existent (De Zeeuw & Geil, 2023).

In this sense, AI-generated images create self-referential semiosis plots that are statistically predictable and probable, like other previous technical images (albeit on an unprecedented scale). As Flusser (2008) warns us, this condition becomes a challenge for image producers, whose critical stance requires them to "make images that are unlikely from the point of view of the device's programme" and "unhide the programmes behind the images" (pp. 28–29).

From a semiotic point of view, a possible development of this reflection would require exploring how the multiplication of AI-generated images through machine learning processes relates to the pragmatic tendency to approximate the final interpretant.

Peirce's pragmatism examines the processes of belief formation that guide behaviour and lead to the improvement of reason over time (Ibri, 2004). This improvement is guided by deliberate scientific thinking, responsible for generating increasingly refined interpretants in semiosis processes, which, in a collective sense, tend to approach the idea of truth more closely, albeit in an ideal manner. In other words, the final interpretant "is a tendency, an ultimate limit, thinkable but not concretely attainable" (Santaella, 2004, p. 78).

As we argue in this paper, the tendency to metastasise is both an intrinsic condition of synthetic images and an unwanted side effect of these AI-generated images, indicating that the self-correcting mechanisms built into the algorithms are still insufficient and incomplete. In this sense, it would be feasible to question the extent to which these images are more disinformative than informative, contributing to an increasingly noisy and entropic information ecosystem.

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