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Angélique Allaire*, Laurent Cervoni**

Magical Simulacra and Simulating Magic: A Baudrillardian Perspective on the Recognizing and Creating Magic Using Generative Artificial Intelligence

Abstract

This essay focuses on the aesthetic experience of magical arts. The rise of artificial intelligence (AI) as a tool to decipher magic tricks or elaborate new tricks puts spectators and performers into question. While considering the current technical characteristics of neural networks and generative AI, we aim to show the impact of AI on magical arts using Jean Baudrillard's hyperreality theory. Like any other technological innovation, AI poses new challenges to the magical arts.

Keywords

Magic, AI, Performing Art, Baudrillard

Introduction

When Prometheus gave fire to humans, he taught them the two principles of survival in a state of nature: identifying and understanding natural laws and acquiring the art of cunning. These are the foundations of any magic when a magician seemingly breaks physical laws before an amazed public. The public of magic knows very well that the events that seem to happen in front of them are impossible, and this incongruency is the source of the enjoyment derived from magic (Leddington 2016). In this essay, we will call magic the performing art designed to trick spectators into believing the extraordinary feats achieved by a magician.

* Talan Group
Email: angelique.allaire@talan.com

** Talan Group
Email: laurent.cervoni@talan.com

From the Westcar papyrus to the card tricks of Harry Lorayne[1] or Juan Tamariz, magic has made spectators suspend their disbelief at the time of a show. But, for a long time, magic seemed to transgress the laws of physics and religion, making it difficult to be perceived as an artistic discipline. Only with the works of Reginald Scot (1584) and J. Prevost (1584) did magic become prestidigitation and was considered an art in its own right. The illusionist became an artist who combined speech, acting, stagecraft, and techniques, with or without apparatus. With Jean-Eugène Robert Houdin, new technologies (at the time, electricity and electromagnetism) integrated magic and contributed to creating new magical effects.

Compared with artistic practices, Artificial Intelligence (AI) is a young technology or even a young science. The name was coined in 1956, although the ambition it expresses goes back to a very ancient search by human beings to reproduce their actions, deductions, reasoning capacities, and all biological behavior. Be it in imaginary form, as the legend of the golem shows, or in mechanical attempts to imitate life, like the digesting duck of Vaucanson, the will to emulate life, especially human will, is not new. With these premises on AI described as an imitation of human behavior in computer form, it is unsurprising to wonder how art, the epitome of human life, will be affected.

As a recent contribution to the field of AI, generative artificial intelligence constitutes a particular approach that produces outputs from massive data sets and an input query (also called prompt) based on techniques defining the most probable sequential elements in a given context. For example, Large Language Models (LLMs) are based on theories published recently in 2017. They generate texts by suggesting the most relevant terms based on context elements. The quantity of content used during the learning phases gives its systems syntactically correct and semantically coherent production capabilities. It is thus possible to ask an LLM to generate a text like a given author or construct texts from incomplete information. The volume of training data ingested and the probabilistic model allows it to display a surprising form of "creativity."

Generative Artificial Intelligences, such as ChatGPT, can also be the origin of that same reality disruption caused by magic in the eye of the public. The similitudes between the discourse surrounding AI and religious discourses have thus been widely addressed in the scientific literature during the last 25 years (Musa Giuliano 2020). For many, tools like DALL.E 2 operate like

[1] Harry Lorayne (1926-2023) was an American magician and author.

a black box to produce endless new creations; the fear is that artists' work will soon be automated. This very fear is in itself a sign that the notions of "genius" or "creation" have not been rejected following Walter Benjamin's essay *The Work of Art in the Age of Mechanical Reproduction* (1935). It is especially true of magic, whose foundations are secret and mysterious. The magician studies them to hide the technique that does the trick. The technique is not so carefully hidden in other art forms, like painting or drawing. The creation of photography and cinema at the end of the 19th century profoundly transformed pictural arts. But magic shows have not been subjected to the same kind of industrialization and still fit the outdated notion of the uniqueness of the work of art.

Often forgotten among the arts, magic is still relatively preserved from the shock of generative AI. Although a century after publication, Benjamin's words are more relevant than ever: "We must expect great innovations to transform the entire technique of the arts, thereby affecting artistic invention itself and perhaps even bringing about an amazing change in our very notion of art" (Benjamin 1935). Since magic has a cognitive component and aims at breaking—at least seemingly—the laws of physics, tools like LLMs are still unable to consider these elements. A magic show is more than a few magic tricks designed to deceive the public. A magic show is a theatrical event based on two elements: the techniques used by the magician and the verbal and nonverbal discourse (music, lightning) surrounding it. This complex combination is destined to create the illusion, the effects the spectator feels, and the perceived magic. Some techniques surrounding cards or mathematical tricks have been published in manuals that "demonstrating the secret of each exercise, […] have borrowed explications so clear and unambiguous that [the reader] will become a swindler by reading [the] compilation" (Anonymous 1863, VI). The will to uncover the secrets behind magic tricks is thus ancient, and the same source advises the reader to protect the secret around prestidigitation by having a sharp tongue and diverting the public's attention (Anonymous 1863, 7). As computers are less vulnerable to such misdirection, we could use algorithms to understand the technique behind the magic. Moreover, as generative AI becomes increasingly common, it could also be used to create new magic shows for spectators to enjoy. AI will then join the potential "arsenal" of a magician, but as with any other artistic discipline, it may transform the aesthetic experience it offers.

This article explores the new challenges posed to magic by the advent of technology capable of decoding and creating magic tricks. Yet, we will argue that AI and magic can be engaged in a complex interaction: our essay will

focus on the impact of AI on the aesthetic experience proposed by a magic show. First, we can wonder if AI can become a new spectator of magic, and then we will explore the potentiality of AI as a magician.

AI as an *emancipated spectator*

According to Walter Benjamin, there are two poles for the reception of the work of art: its cult and exhibition values. With magic, we recognize its cult value in the techniques hidden from the public, and its exhibition value is reflected in its theatrical dimension. The effects lead the spectator to believe they are witnessing events that they deem impossible, and the skilled magician hides the tricks they use. The goal of a magic trick is to make the spectator believe they witnessed something they know is impossible. The audience is, therefore, at the center of a magic show.

Historiography has traditionally found it difficult to analyze the role of the public. The recent apparition of highly engaging and immersive spectacles highlights the importance of a mode of spectatorship that elevates itself almost to coauthor status. It is evident with projects like *Origami for Life*, organized by Belgian designer Charles Kaisin, the Engie foundation, and the Palais de Tokyo in Paris: during the multiple 2020 COVID lockdowns, people were invited to make paper cranes and to mail them to the Palais de Tokyo. Then, starting in January 2021, visitors could admire an installation made of all the cranes received by the contemporary art center that they made themselves during the past year. On the other end of the spectrum of public analysis is Guy Debord's captive audience-consumer, embedded in a society of the spectacle (Debord 1970). This kind of public just passively absorbs whatever media is fed to them by a capitalist society. The spectator of a magic show stands probably in the middle: they are looking, which is the opposite of acting, and are ignorant of the production conditions of the show. But from this passivity, sometimes participation emerges when the magician directly talks to them or asks them to pick a card, as we can often see in Juan Tamariz's shows. Ultimately, no matter the amount of participation, the spectator of a good magic show will be fooled by the magician's skills.

The recent development of technology enables a machine to "watch" by training a deep neural network to track features in animals or humans, like DeepLabCut, a tool aimed at biologists to track the posture of animals like mice or drosophila (Nath *et al.* 2019). These tools can match the capabilities of humans and become artificial spectators. An artificial spectator may be more difficult to deceive, which is how Regina Zaghi-Lara *et al.* (2019)

trained an artificial neural network to follow a coin in a series of sleight-of-hand coin tricks. The tricks were designed to be purely motor, did not involve any verbal indications, nonverbal cues, special effects, or gimmicks, and were compelling enough to deceive the human eye. A machine does not watch like a human does. It follows each pixel frame by frame without dividing its attention. The machine is about surveillance, not spectacle, and it watches the show "neither in the amphitheater nor on the stage but [as] the Panoptic machine" (Foucault 1977, 217). Therefore, the neural network is a new kind of spectator. With machines, the opposition between watching and knowing disappears, at least partially, because they are way more capable of seeing the conditions of production behind the appearances (Rancière 2007, 2-3). Its vision is superior to human vision; essentially, a spectacle is the epitome of vision (Rancière 2007, 6).

The DeepLabCut neural network can watch the magic trick without being fooled by ordinary human perception bias, but it is not a mere tracking tool: it follows the position of a coin as a magician manipulates it. It follows the coin when visible and can also guess its position when hidden (Zaghi-Lara *et al.* 2019). Not surprisingly, in the study of Regina Zagui-Lara, the neural network is fooled less often than the human spectator, although the study also showed that some of the cognitive tricks used to deceive humans can also be very efficient when it comes to machines. This study enables the researcher to consider human biases that the machine is deprived of. For example, in one of the tricks, the human is influenced by the law of symmetry. Analyzing the art of magic with a neural network proved to be a satisfying tool to estimate what machines learn from humans by underlining what they do not do (Zaghi-Lara *et al.* 2019), but above all, it proves to be quite efficient when it comes to enhancing human perception of what happens during a magic performance. In that sense, AI only reinforces tendencies that scholars already described. AI is not quite a spectator of magic shows but an observer, "one who sees within a prescribed set of possibilities, one who is embedded in a system of conventions and limitations" (Crary 1992, 6). DeepLabCut cannot be fooled by the magician, even when it does not manage to successfully track the coins, because it does not understand the physical realities that make the appearance or disappearance of the coins impossible. In that sense, DeepLabCut is not superior to human eyes since "our eye finds it more comfortable to respond to a given stimulus by reproducing once more an image that it has produced many times before instead of registering what is different and new in an impression" (Nietzsche 1998, 192). And that is precisely how AI functions: it is trained on specific

data sets and then imitates what it was trained on when asked to perform a task. But since AI can see above human biases through broader possibilities, it can narrow down the "hyperreality" of the filmed magic tricks. Hyperreality is a concept identified by Jean Baudrillard to describe the confusion of the mind between reality and its representation (Baudrillard 1981, 1).

The success of magic, as far as it is measurable in terms of signs, resides precisely in this space endangered by the all-encompassing asynchronous perception of neural networks. However, magic cannot be resumed to a dry series of gestures. It is a performing art that includes theatrical and psychological dimensions that a neural network such as the one tested by Regina Zaghi-Lara (2019) cannot grasp all at once.

However, this ability of the AI to be insensitive to specific "weaknesses" of the biological brain (misdirection, visual afterglow) ultimately presents advantages for training the magician, who now has an extremely difficult spectator at his disposal. Not all spectators react identically to the performer's text or action in a magic show. AI allows for simulating a soulless interlocutor, indifferent to technical gestures or the most elaborate speeches.

AI as a sorcerer's assistant

Arts and science have been intertwined for centuries now. As Paul Valéry (1934, 191) showed, the act of painting was a supreme demonstration of knowledge for an artist like Léonard de Vinci, and he thought it required him to become omniscient. When photography and film were invented, they became almost instantly art too. Therefore, it is not surprising to see art made using AI today. It would be *cliché* to affirm that while magic exploits the weaknesses of the human mind, AI aims to enhance its abilities. However, this fundamental opposition between the art of magic and artificial intelligence technology should not be forgotten. Since neural networks surpass the human mind when recognizing reality and manuals aiming to educate the would-be-magician have existed for more than two centuries, large language models (LLM) could be interrogated to generate new magic tricks. Of course, the success of a magic trick also depends on the theatrical performance of the magician, but could AI invent new tricks and techniques? A few queries on ChatGPT or LLaMa 2 (on HuggingChat) show that LLMs do not consider the physical reality of the tricks and describe magic tricks like an innocent spectator could perceive without going into the actual trick part. A possible explanation would be the lack of magical literature in the training corpora of these LLMs.

The LLMs can also not recognize a magic trick described by the user: most magic tricks are based on a prop or a unique effect that gives them their names, such as the "Chinese linking rings." If a user describes a trick to ChatGPT or LLaMa 2 and asks the AI to name it, the LLM will invent an answer but cannot effectively recognize the trick. The knowledge about magic is carefully preserved by magicians who try to keep it secret, although magic books have been published for centuries, and more recently, with social media, many tutorial videos are posted online. The culture of secret, though, explains why the knowledge about magic has not been classified and organized like other arts: descriptions are scarce. The classification of magical knowledge is even less advanced, and while a few different taxonomies have been proposed, none were widely accepted (Rensink, Kuhn 2015). The very classification as magic is blurry: it encompasses the magic tricks we focus on in this essay but can also include alleged paranormal phenomena. The inner classification of magic is, therefore, even more blurry. Some suggested an ordering by techniques, others by psychological effects. That is why the LLMs cannot correctly recognize and name the magic tricks a user describes.

While the recognition or the complete creation of magic tricks seem to be challenges that LLMs cannot solve, AI could be used to optimize existing magic tricks to maximize spectators' enjoyment. Howard Williams and Peter W. McOwan (2014, 1283) designed a framework in that sense in 2014 that could evaluate and design new magic tricks originating from existing ones. This framework was based on probabilities to maximize the impact on the public and could also be adapted to specific tricks based on cards. While not entirely creators, algorithms proved themselves valuable assistants in designing new magic tricks, resulting in a jigsaw and a phone app. Their sales then measured their efficiency in a well-known London magic shop: the postulates being that a reputable magic shop would not integrate low-quality tricks into its catalog and that direct sales to magicians could provide insight into the success of the tricks to their target audience (Williams and McOwan 2014). In that experiment, though, the machines here did not invent entirely new magic tricks but analyzed and tweaked existing ones to maximize their success, as measured by the enjoyment of their public. Its efficiency resides in its ability to perform complex analysis at a speed that is unattained by humans. This capability led the authors to question the notion of creativity in a subsequent article published in 2016 to show that this exploratory work generates new ideas by exploring structured conceptual spaces (Boden 1998), is indeed creative, and should not be discarded as a mere stochastic process. More recent works on artificial creativity showed,

with compelling evidence, that artworks created by AI were recognized, at least in terms of monetary value (Tigre Moura *et al.* 2023).

These limitations of generative AI when creating new magic tricks can be linked to a poor training corpus. Generative AI, when asked to produce visual representations of magicians, shows poor iconography, mostly revolving around top hats, cards, and white rabbits. The lack of a culture of magic is showing and most probably devolves from insufficient content in the training corpus. Therefore, it is safe to say that AI is not "the generation by models of a real without origin or reality" and is not a hyperreal, even though we showed it could narrow the hyperreality in which magic happens (Baudrillard 1981, 1). AI thus modifies the interaction between consciousness and the magic performance.

Tigre Moura *et al.* also point out the obvious: very few works of art are entirely artificially created. Most often, there are human interventions, and it would be more accurate to discuss the co-creation of works of art and their quality. This distinction also supports our argument: based on a simple and short prompt, an LLM fails to create a new magic trick. Nevertheless, with more complex algorithms that consider human feedback, it is possible to artificially co-create new magic performances by optimizing older ones.

Conclusion

Artificial Intelligence is based on "the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it" (McCarthy, Minsky, Rochester, and Shannon 1955). It attempts to reproduce artistic performances. Generative AIs are, therefore, those that have the most striking impact on art of any kind. It is then indisputable that technological improvements will transform how a work is produced and even how the public will perceive it. The world of magical arts is not immune to these transformations.

Several tendencies finally emerge from the confrontation between magical arts and artificial intelligence. First, as the public perceives, at least momentarily, AI as a "magical" and sometimes incomprehensible mechanism, artists can invoke Artificial Intelligence as a kind of assistant capable of helping them guess a card chosen by a spectator or make a prediction. Romain Lalire, a French magician, is already exploiting this path. Like any other heavily discussed technological innovation, AI can be used as a prop in a show. AI can also be an impartial "coach" to practice magic. The "insensitivity" of AI to specific conjuring techniques forces the magician to consider several be-

havioral approaches and variants in their practice. In *Sleights of Mind* (Macknik *et al.* 2010), the authors point to the cognitive differences of human viewers who can react differently to the same trick. An AI can help a magician progress in their practice. However, some limitations of AI in its perception of the physical world forbid it to be systematically more efficient than a human. Finally, the magician artist may consider leveraging AI to create parts of their show. For example, music can be designed using AI with perfect synchronization between highlights, weaknesses, and the climax of a turn. Gradually, based on adapted training, multimodal AIs can produce ideas for magic tricks or suggestions for accompanying texts.

Unlike other arts, the dangers that AI can pose to the magical arts seem less critical. Most importantly, because the secrecy surrounding the world of magic limits the training data available, even if many accessible books and videos violate it, these contents are in small quantity compared to musical works, paintings, plays, poems, *etc*. Secondly, as David Devant points out in *Secrets of my Magic* (1936, 54), this secret character makes this art "less popular than the arts more comprehensible [...] because the main support of any art is the amateurs" who practice it. The magical arts constitute a small world, ultimately a form of protection against mechanization.

In the end, the real danger that AI embodies would be to enable a magician to perform the perfect illusion, especially with the performance of virtual magic tricks. With the words of Baudrillard, we can affirm that "virtuality tends to the perfect illusion [...] it is a "re-creative" (and re-creative) illusion, realistic, mimetic, hologrammatic. It ends the illusion with the perfection of the imitation, of the virtual re-edition of the real" (Baudrillard 1997, 61-62). With its complex relationship to the notions, ever so relevant, of hyperreality and hyperreal, AI transforms the aesthetic experience of the magical arts for both the spectator and the performer.

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