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The Future of Creative Expression Through Professional Artistic Education: Artificial Intelligence and Human Art

El futuro de la expresión creativa a través de la educación artística profesional: inteligencia artificial y arte humano

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Abstract:

Academics in higher education institutions that offer programs in creative fields —such as Visual Arts, Plastic Arts, Audiovisual Media, Animation and Visual Effects, Architecture, Cinematography, Communication, and related disciplines —face the enormous responsibility of preparing themselves to address the challenges posed by ongoing technological transformation. It is imperative to critically examine how artificial intelligence and emerging technologies can enrich and reshape the field of art, while also considering the potential risks and limitations associated with their use. This study guides reflection toward a renewed appreciation of human creativity and artistic expression by exploring algorithms designed to replicate human creative processes within artificial intelligence. To this end, a systematic literature review is conducted to identify key distinctions between human creativity and the training mechanisms of AI algorithms. Ultimately, this article promotes thoughtful reflection on the timeless value of human creativity and artistic expression, emphasizing the importance of preserving their essence and uniqueness. Within this framework, the role of the artist-educator is to provide meaningful knowledge and to foster exploration and experimentation in students' artistic practices.

Keywords: Artificial Intelligence in Education, Human creativity, Art, Ethical implications.

Resumen:

Los académicos de instituciones de educación superior que ofrecen programas en áreas creativas, como Artes Visuales, Artes Plásticas, Medios Audiovisuales, Animación y Efectos Visuales, Arquitectura, Cinematografía, Comunicación y disciplinas afines, enfrentan la enorme responsabilidad de prepararse para abordar los desafíos que plantea la transformación tecnológica actual. Es imperativo examinar críticamente cómo la inteligencia artificial y las tecnologías emergentes pueden enriquecer y transformar el campo del arte, considerando, al mismo tiempo, los posibles riesgos y limitaciones asociados con su uso. Este estudio guía la reflexión hacia una renovada apreciación de la creatividad humana y la expresión artística mediante la exploración de algoritmos diseñados para replicar los procesos creativos humanos dentro de la inteligencia artificial. Para ello, se realiza una revisión sistemática de la literatura para identificar las distinciones clave entre la creatividad humana y los mecanismos de entrenamiento de los algoritmos de IA. En definitiva, este artículo promueve una reflexión profunda sobre el

valor atemporal de la creatividad humana y la expresión artística, enfatizando la importancia de preservar su esencia y singularidad. En este marco, el rol del artista-educador es proporcionar conocimiento significativo y fomentar la exploración y la experimentación en las prácticas artísticas de los estudiantes.

Palabras clave: Inteligencia Artificial en la Educación, creatividad humana, implicaciones éticas.

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| *Introduction*

The integration of artificial intelligence into artistic creation presents unique challenges and opportunities for both the academic and artistic communities. Teachers and students must be prepared to confront the challenges and seize the opportunities presented by this new digital era. It is imperative to critically and thoughtfully analyze how these technologies can enrich and transform the field of art while preserving the essence and uniqueness of human creativity (Heaven, 2023). Collaboration between technology and art represents a pathway toward innovation and the exploration of new creative frontiers. However, maintaining an ethical and thoughtful approach is essential at all times to ensure that the use of artificial intelligence in art respects and enhances the integrity of artistic creation.

University education in visual and artistic training must promote critical and deep reflection on the impact of emerging technologies on art. Above all, it is crucial to take a clear and visible stance on the value of human creativity and artistic expression in all their forms and disciplines (Ferrer, 2018). This reassessment will enable us to appreciate and defend the enriching role of art in human existence and address the challenges posed by our era of digital transformation. Simultaneously, gathering relevant information is crucial for engaging in discussions about the ethical implications of artificial intelligence, supporting arguments through critical reflection, and formulating individual positions.

Through the implementation of machine learning techniques and data processing, algorithms can generate impeccable products. However, the question arises: Are they original products? Is it possible that these are artistic creations? Or do they require another categorization? These questions provoke an interesting and complex theoretical reflection, particularly in academia, where such discussions must flourish and expand. It is crucial to contrast available information, current concepts, and knowledge of human cognitive processes—such as emotions, experiences, intentionality, and subjectivity—to advance our understanding of this topic.

With an exploratory intent, several questions arise regarding the role of universities and their departments in artistic education in the era of artificial intelligence: How does the use of AI impact creative works, including video and audio productions, image generation, art and character design, and 2D and 3D art, among other disciplines? As a human artist, in what ways does the use of AI benefit or hinder me? What definitions within art need to be expanded or reformulated? What should be the role of art faculties in the use of AI, and what criteria should guide their approach? How can academic programs effectively incorporate new technologies into students' creative processes? What ethical challenges emerge from using algorithms in artistic creations? These issues underscore the need for ongoing dialogues within art institutions, citing success stories and achieving a diverse and well-founded consensus on criteria for guiding the use of AI in the arts and knowledge transmission. New generations of professionals must enrich their artistic education and strengthen their critical thinking to develop their criteria for using artificial intelligence.

The sense of threat to creative sources of work brought about by the development of increasingly powerful and intuitive technologies is palpable. Hence, we propose an approach that reevaluates the role of work and human creativity.

Moreover, it is essential to analyze how algorithms are trained to follow methods that enable creativity. Professor Margaret Borden, an investigative professor of cognitive science at the University of Sussex, has explored concepts of historical and psychological creativity to explain how algorithms can be trained

using creative methodologies—combinatorial, exploratory, and transformative—to achieve innovative results that mirror human creativity.

The purpose of this chapter is to provide a comprehensive discussion of artificial intelligence and its intersection with the human arts.

| *Key Concepts*

Art is a form of work that, until this decade, was unquestioningly assumed to be the product of a task performed exclusively by conscious human beings—an activity that is deliberate and intentional. Concepts such as genius, talent, originality, and technical skill for centuries have defined clearly what art should be, its ethos, and its pathos. In this post-pandemic technological juncture, we are faced with the question of whether artificial intelligence is truly creative, given that its results are similar to, and even indistinguishable from, those produced by humans (Boden, 2009). When we reflect on it closely, it is astounding that AI-generated products are indistinguishable from human artworks and, in some cases, visually superior. How technological means of image production, formats, and media have transformed to the point where humans are no longer the sole creators is both unpredictable and remarkable.

This paper argues that a historical review of the concept of art, as understood in the contemporary context, is necessary, just as a reassessment of the concept of creativity is essential, on the assumption that creativity is a fundamental condition for the creation of art

Larry Shiner, in his book The Invention of Art (Shiner, 2023), contends that art is a European invention barely two hundred years old. Economic, political, and technological forces shape and influence many aspects of our lives, including the concept of art, access to technology, and our ability to modify its evolution and use (Horkheimer et al., 1971). It is likely that, in the realm of art as well, our definitions, expectations, and the scope of what we consider "art" have already been shaped by consumer relations, the media, and the art market.

In Dialectic of Enlightenment, Theodore Adorno presents a critique of the transformation that a work of art undergoes when it becomes a commodity, explaining how it adopts its ideal of beauty from advertising and is converted into a product of the culture industry, offered to the masses in exchange for little or nothing. Today, our perception of the artistic world is governed by the speed and voracity of consumption, by an inexhaustible supply of stimuli of all kinds. As a result, it becomes increasingly difficult to distinguish between cultural consumer goods and true works of art (Horkheimer et al., 1971).

The historical context in which a work of art emerges is inherently multidimensional, while art can rarely be truly universal, it reflects, to varying degrees, the social, political, technological, and even moral dimensions of its time.

Since the Middle Ages, two primary forms of art have been distinguished: one grounded in manual activities and technical skills, and another intended to elevate the human being as a thinking creator beyond labor (Joseph & McGlinn, 2002). Centuries later, this dichotomy persisted in the contrast between mass art and fine art, each defined by its modes of production, audiences, and economic relationships. Mass art was often considered intended for an undiscerning public. Walter Benjamin, in

his reflections on mechanical reproduction, observed the loss of the aura in art as a consequence of its mass replication (Benjamin, 2018).

The rise of totalitarian regimes in the twentieth century further provoked reflections on the social and political function of art and contributed to the transformation of traditional artistic forms. At that time, a fundamental question arose: Should art reject any social utility and exist solely for its own sake—l'art pour l'art (Horkheimer et al., 1971)?

Marcel Duchamp radically challenged the notion of elevated art with his Fountain (1917), thereby expanding the definition of what can be considered art. It cannot be definitively stated whether this anti-art gesture marked the end of technical skill in the arts, but it did lead to the erasure of the boundary between art and life. Today, it is often the artist's life that redefines the work of art itself. The act of enshrining ordinary objects within museum spaces, thereby desacralizing art, resulted in the artist being perceived more as a thinker than a maker. In the current context, a work of art may originate from a question or an idea rather than from craft alone.

There is, undeniably, a moral dimension to the arts. The notion of human artistic creation being supplanted by artificial intelligence is perceived as ethically troubling, as it is expected that the artistic work should arise from, reflect, and provoke a deep understanding of our humanity. It is not enough to reproduce artistic forms. What is morally objectionable about an AI system capable of mimicking the drawing style of Studio Ghibli is not just the act of replication, is that the result is entirely devoid of humanity. Miyazaki's illustration style is shaped by discipline, trial and error, experiences, sensitivity, contemplation, fragility, dreams, and the emotional depth of the artist.

Art is much more than a skill. Before being a skill or technical ability, it is a human choice that originates from an individual impulse—a strong desire or resolution to make an artistic impact on the world (Figure 1). Creating art involves a series of complex mechanisms based on criteria for selecting and discarding options. What seemingly boils down to the free choice to express something through any medium or technique is a complex protocol that transcends ordinary expression. Consider poetry, for example. It seems that musicality dictates the order of the words selected to form a poem. If an idea can be conveyed through prose, what is the need to communicate poetically? It is the sense of what is desired to be expressed. In this sense, art transcends the ordinary.

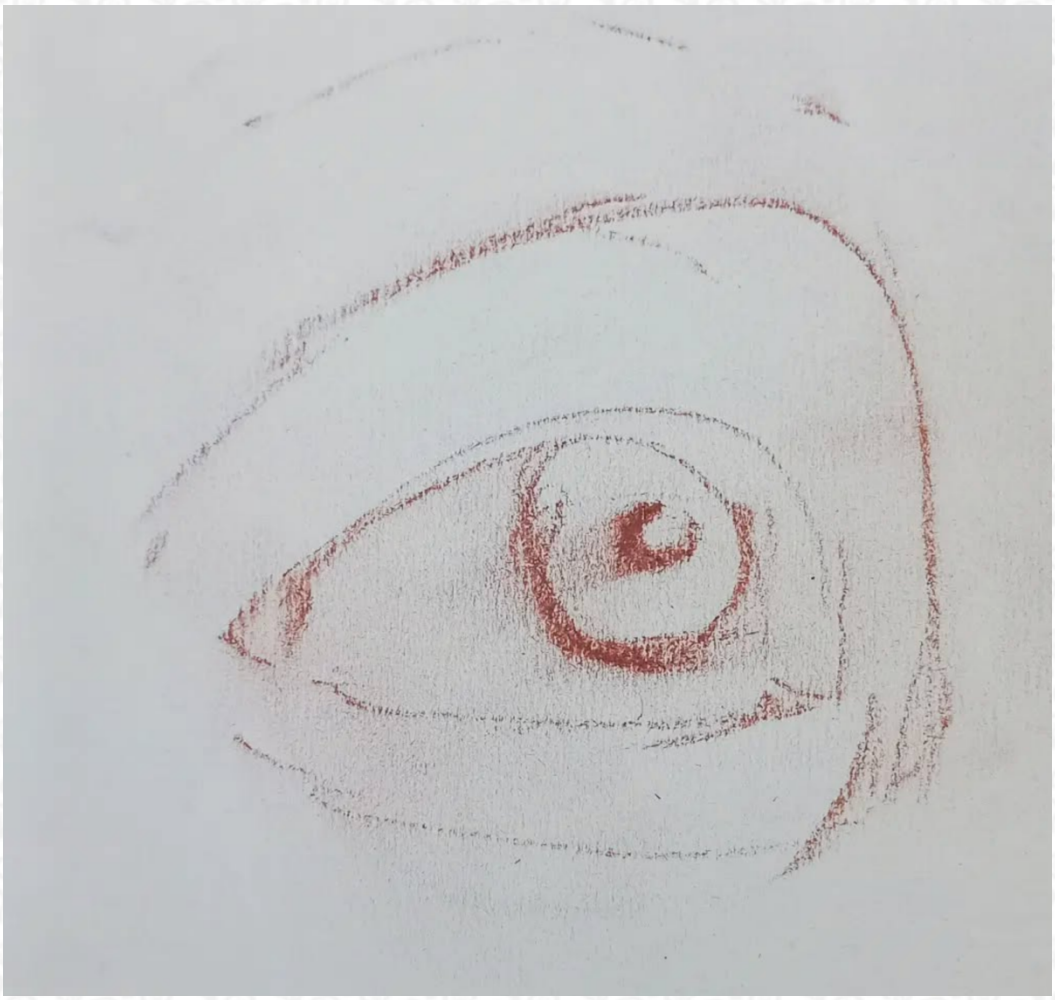
Once the impulse to create exists, the choice is defined beyond the technical capacity to affect any material and even invent new supports, disciplines, spaces, and processes, whether material or immaterial, for artistic creation. According to Tatarkiewicz (Tatarkiewicz, 2002), art is a conscious human activity capable of reproducing things, constructing forms, or expressing an experience, as long as the product of this reproduction, construction, or expression can delight, move, or produce a shock.

Art is a mode of expression in all its essential activities. Art tries to tell us something about the universe of man, the artist himself. Art is a form of knowledge as precious to man as the world of philosophy or science. Indeed, only when we recognize that art is a form of knowledge parallel to another, but distinct from it, through which man comes to understand his environment, can we begin to appreciate its importance in the history of humanity (Ascott, 2000).

Contrary to what may be assumed, art is, beyond being a product, as Ascott asserts, an alternative form of knowledge through which human beings leave a testimony of their experience in the world. In psychology, the perspective provided by the Gestalt model, creativity is not limited to a recombination of pre-existing ideas but involves the generation of thoughts within the human mind.

Figure 1

Art sketch, creating art involves a depth that goes beyond skill. Courtesy: @martistastudio, all rights to the artist



The initial creative impulse is a thought originating in the mind; the ability to generate something new, a form or idea, is an expression of the will or creative impulse. In addition to generating new ideas, these mental structures (gestalts) transform, modify, and adapt into more stable forms. Creative solutions are thus found through problem analysis, detailed observation, spontaneous understanding of the relationship between parts, and the adjustments needed based on the analysis of the whole.

While the algorithms used to train artificial intelligence replicate the pathways of human processes and result in creative outputs, the philosophical question that many prefer to avoid remains: Is artificial intelligence truly creative?

From the psychoanalytic perspective, creativity comes from both the unconscious and conscious aspects of the individual, and art is a compensatory product of the conflicting relationships between these two worlds, the internal and the external ("El psicoanálisis, el inconsciente y el arte," 2023). In other words,

art is the vessel for unconscious drives presented in a socially acceptable form, providing satisfaction, relief, resolution, and freedom.

The musician Brian Eno raises the possibility of abandoning the idea of art as an object and exploring the possibility that it is an experience, a process, or a performance. Any type of experience that we can call artistic.

Stop thinking of artworks as objects and start thinking of them as triggers for experiences. That solves many problems: we don't have to argue whether photographs are art, or if performances are art, or if Carl Andre's bricks or Andre Serrano's Piss Christ or Little Richard's 'Long Tall Sally' are art... Art is something that happens a process, not a quality, and all sorts of things can make it happen. ... What makes a work of art 'good' for you? It's not something that's already 'in there,' but something that happens within you—thus, the value of the work lies in the extent to which it helps you have the kind of experience called art.. — Brian Eno, English musician, producer & visual artist (Ascott, 2000).

It is difficult to label art as merely a product, although it results from its material and historical reality. As we see in this review of concepts, it is not only produced for economic purposes but also serves as a repository of human inner life. Art has represented the glory and decline of empires, the rise of prevailing ideas, the ethos of its time, and now it is no exception

We will conceive art as a sociocultural phenomenon, whose production and appreciation are specialized. Its production occurs in various media and requires different materials, techniques, and procedures. Artistic practice aims to professionally create images, sounds, and movements capable of producing aesthetic effects (Acha, 2005).

In summary, what we can currently consider art transcends the methods and techniques through which it is obtained; it also surpasses the material reality of certain products and adopts intangible supports. The concept of art must be broad enough to encompass aesthetic experiences and the sensitive effects it can trigger. All of this without losing sight of the crucial human component, which is the will that chooses the processes through which art is created. Individual will and subjective sensitivity, as well as intentionality and experience (Figure 2).

Dr. Margaret Borden suggests that art is not an activity exclusive to a certain enlightened elite (Boden, 2018). This aligns with the ancient Greek belief that art was the result of inspiration provided by the muses. People from all over the world can indeed take instruments, materials, practice any discipline, and even achieve outstanding quality standards, or perhaps not; technical skill has long ceased to be at the center of the discussion. The central issue here is that humans are not programmed to be creative; indeed, as a survival mechanism, imitation, observation, repetition, and conventions work better. Yet, humans still manage to desire to create art. This may be for the most diverse reasons, from a broken heart to the desire for immortality.

It is evident that computers are capable of reproducing the pathways of creativity through the use of algorithms, and it is clear that, up to this point, computers lack consciousness, an inner world, an unconscious, and emotivity (Lamers, 2023). Therefore, the question of whether they create art becomes irrelevant and transforms into another question: How does the use of artificial intelligence affect the work of artists?

Figure 2

Art final sketch, art can trigger sensitive effects and aesthetic experiences. Courtesy: @martistastudio

| *Documentation of Training Algorithms for Creativity and Creative Methods: Comparison Before and After*

Introduction to creative algorithms

The outcomes or products of a creative process can be very diverse. For example, the creativity that leads a painter to develop a work of art cannot be compared with the creativity possessed by a team of engineers solving a problem with machinery or a computer system; both are creative products, but their conception, development, and resolution were surely very different. Both can produce original and novel results; however, they do not function in the same way. This may be because creativity develops and occurs based on the context and situation in which the events are generated. If, on one hand, for the painter to develop his creativity he had to read philosophy, study color theory, listen to music,

contemplate landscapes, and engage in other additional activities that artists undertake to obtain their source of inspiration, the engineers had to study, experiment, and practice trial and error to develop a solution to the problem they face. It is very likely that if those engineers used the painter's creativity development techniques previously mentioned hypothetically, they would not have been able to achieve the expected solution; therefore, creativity arises based on the context, the elements, and the subjects involved in the process (Gaki, 2024).

Several creative processes can be addressed, which occur depending on the necessities. Human beings can manage this process according to the environment, their education, and their personal development. These processes can be referred to as creativity algorithms, and we can name some of them (Figure 3):

- **Creativity through Association:** In this algorithm, creativity occurs through the association of ideas, elements, data, or context(Aguilera, 2024).
- **Creativity through Imitation:** According to Gonzalez (González, n.d.), in creativity and imitation in the art of lace, this involves reproducing an object or technique to make the final result as similar as possible to the original model. Similarly, it is possible to take an existing model and perfect it, modify it, or evolve it.
- **Creativity through Exploration:** This type of creativity is widely used by artists and innovators because it demands a certain level of expertise (FasterCapital, 2024)
- **Creativity through Requirement:** This type of algorithm emerges or activates in response to a problem or an imposed or self-imposed challenge (Gaki, 2024).

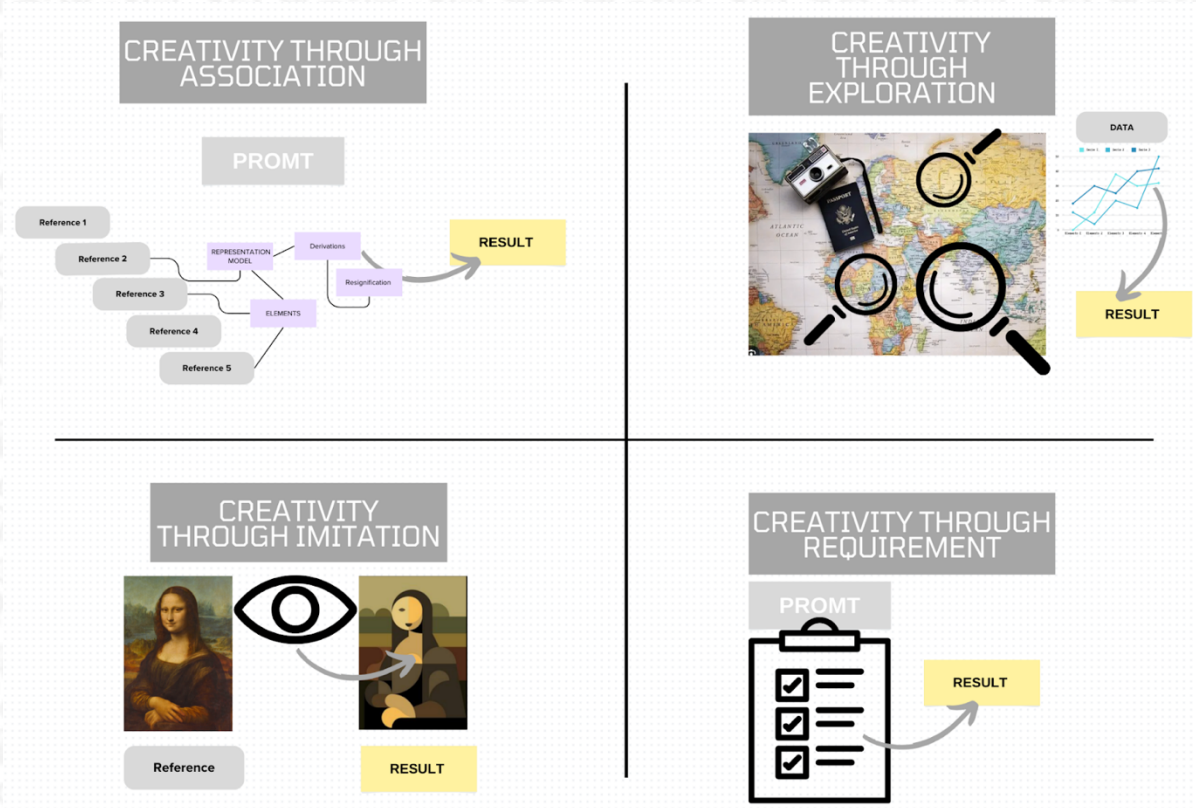
How are they different from other types of artificial intelligence algorithms?

As mentioned earlier, human creativity comes from the environment, a series of experiences, life events, sensations, and emotions, which form an integral part of human creativity. AI can indeed generate creative content based on data, statistical algorithms, and patterns learned from other existing examples. AI lacks genuine emotions and experiences, which are a crucial part of human creativity. Although the results of artistic products created by artificial intelligence are impressive, they do not replicate the depth of human creative expression (Esling & Devis, 2020).

AI in artistic creation has raised concerns about whether AI can replace or pose a threat to artistic representations made by humans. Many artists and art historians resist considering AI work as art; however, there is the possibility that AI can be integrated into the artistic field, coexisting and collaborating in human artistic practices, thereby expanding the definitions and methods of artistic creation (Esling & Devis, 2020).

Figure 3

AI methods for creativity. Source: Own elaboration



| *Early history: First experiments with AI and Art*

In the 1970s, Harold Cohen developed one of the most significant artificial intelligence projects applied to art, known as the AARON project, at Stanford's AI lab. AARON was an expert system encoded with Cohen's knowledge of composition and color, designed to create artworks. Initially, the system employed simple rules and a procedural approach to draw human figures and other scenes. Over time, Cohen refined the program so that it could execute more complex compositions and utilize more colors, demonstrating that AI could actively participate in a creative and innovative process (Cohen, 2016; Nake, 2019).

Another notable project was the "Sound Activated Mobile" (SAM) by Edward Ihnatowicz, created in 1968. It was one of the first cybernetic sculptures, designed to react to environmental sounds such as human voices and music. As a precursor to both robotic technology and interactive art, it fostered a change in the perception of art. Traditionally, sculptures are static, but SAM challenged this convention by responding to its environment and making movements. This interactivity demonstrated that works of art can be capable of changing and responding in real time, creating a more immersive and personal experience for the viewer, and marking a point of special interest in the visual arts (Zivanovic, 2005).

After exploring the innovative use of AI in creating kinetic art with SAM, it is essential to examine how these technologies have evolved to address even more complex challenges, such as those addressed by Deep Blue in the world of chess.

In his book Kasparov versus Deep Blue: Computer Chess Comes of Age, Monty Newborn (Newborn, 1997) conducts a detailed analysis of the matches between Garry Kasparov, one of the most renowned chess players of all time, and Deep Blue, IBM's supercomputer. Newborn details the first encounter in February 1996, which consisted of a six-game match. Kasparov won three of these games, tied two, and lost one to Deep Blue; therefore, Kasparov won the match 4-2. This was the first time an artificial intelligence won a game under standard conditions against a world champion. However, this victory was not enough to win the entire match. After that game, significant improvements were made to the system, and an enhanced version called Deeper Blue was developed. In 1997, Deeper Blue played and defeated Kasparov, marking the first time a world chess champion was defeated in a match under standard tournament conditions by a computer (Goodman & Keene, 1997).

After exploring Deep Blue's remarkable success in chess, it is essential to examine how artificial intelligence continued to evolve, leading to even more impressive developments. AlphaGo, developed by DeepMind Technologies, represented the next major leap forward, tackling the intricate complexities of Go. AlphaGo was developed to play Go, a highly complex strategic board game that originated in China over 3,000 years ago. Unlike Deep Blue, which analyzed millions of positions per second, AlphaGo learned to play Go using a combination of deep learning, neural networks, and the Monte Carlo Search Algorithm (MCTS), learning the game through pattern recognition and using millions of Go games to train its neural networks. In March 2016, AlphaGo faced one of the world's most prominent Go players, Lee Sedol, in a five-game match, of which AlphaGo won four. However, the most remarkable game was the second one, especially because of move number 37. In this move, AlphaGo made a strategic move that no player would have considered in normal situations, causing confusion and disorientation in its opponent, Lee Sedol, and changing the course of the game. Move 37 became the classic example of how AI can offer new perspectives on widely studied situations and demonstrated that it cannot only emulate human intelligence and decision-making ability, but also innovate and create new ways of thinking when facing complex problems, opening new avenues for exploration and understanding (Granter et al., 2017).

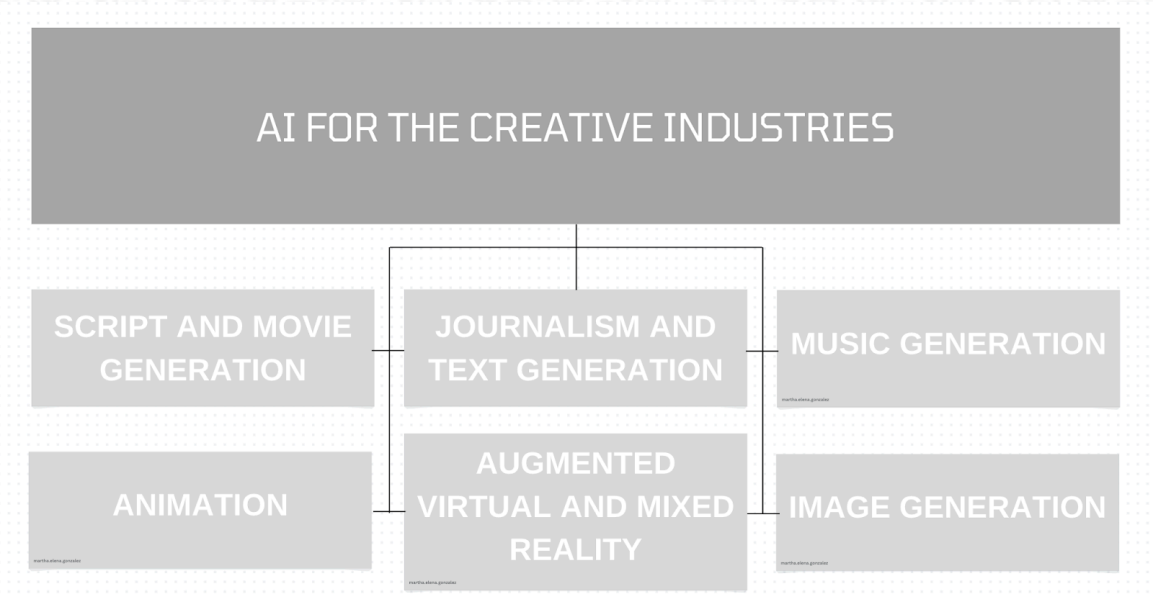
Technological evolution

Upon exploring the beginnings of artificial intelligence in art and the creative and innovative process, it is crucial to review how these technologies have been evolving and expanding over time. Technological advancement in the field of AI has allowed not only to improve existing capabilities, but also to open new frontiers in automated creativity.

This segment will focus on deep learning methods, describing some relevant applications in the creative industry and exploring how each innovation has influenced the creative capacity of AI, expanding the capabilities and possibilities concerning computer-generated art. (Figure 4).

Figure 4

AI applications in the creative process. Source: Own elaboration



Script and movie generation

AI technologies have been used both to support the creative process and to be creative in their own right. Artificial intelligence has been used both to create stories and to support the use of data, for example, searching through vast amounts of archives for information for documentaries. In 2016, the script for the short film Sunspring was written entirely by an AI machine called Benjamin, created by New York University. The model, based on a recurrent neural network (RNN) architecture, was trained using science fiction film scripts and other texts as input data. The result was a quirky and sometimes incoherent script. The aim was to explore how AI could contribute to the field of filmmaking, resulting in the idea that AI technology works most efficiently in collaboration with humans (Anantrasirichai & Bull, 2022).

In 2016, the AI platform IBM Watson participated in the creation of a trailer for the horror movie Morgan. Watson uses various advanced AI technologies, such as Natural Language Processing (NLP), which enables it to understand human language. Additionally, it employs Machine Learning to refine its algorithms and improve the accuracy of responses and analysis, as well as voice recognition, which is useful in virtual assistant applications and interactive response systems. Computer vision was used to analyze and understand visual content, identifying key elements in scenes that could generate an emotional impact on viewers. It also utilizes neural networks and deep learning algorithms, which allow it to perform tasks such as classification, prediction, and pattern recognition, among others. Although the final trailer was edited by humans, Watson's involvement not only demonstrated its ability to understand and process visual and emotional content but also opened the door to intense debates about the role of AI in creative processes like video editing and film production (Yu et al., 2020).

Journalism and text generation

Artificial intelligence has also had a significant impact on the generation of journalistic text, revolutionizing the way news is generated and distributed. Below, we will discuss some important examples.

One of the most notable cases of AI being used in journalism was during the 2016 US presidential election and the 2018 midterm elections, when The Washington Post's Heliograf system was utilized. Heliograf, which employs natural language processing (NLP) techniques and machine learning models, was used to generate automated reports on the election results. The software collected data in real time and compared it to historical data and other relevant statistics to generate news updates that were published directly on the website (Latar, 2018).

Heliograf's ability to quickly generate texts with clear and precise information freed journalists from their more routine tasks, allowing them to concentrate their efforts on deeper analysis, interviews, and field coverage. With this mixed approach, it maximized the efficiency of the newsroom by providing up-to-date information instantly without compromising the quality of the journalism offered (Alieva, 2023).

Another notable example of the use of AI in the field of text generation happened in September 2020, when the English media, The Guardian, published the article A robot wrote this article. Are you scared yet, human? The article was written by GPT-3 created by OpenAI, a for-profit artificial intelligence laboratory based in San Francisco. The objective was for the AI to write a complete article of approximately 500 words on the topic of why humans should not fear AI. The Guardian and Liam Porr, a computer science undergraduate student at the University of Berkeley, prepared an introduction from which GPT-3 was to generate the article.

GPT-3 generated 8 different essays in response to the initial prompts provided by the editors, and then the editors selected and edited fragments of these essays into a single coherent article.

The publication of this article sparked a wide-ranging debate about the ethics of using AI in content generation, with primary concerns around authenticity, authorship, and potential implications for journalism and creative writing (Ackermann, 2020).

Music generation

AI has revolutionized many of the existing creative industries, with music being one of them. By building machine learning (ML) algorithms, AI can detect patterns and structures in large sets of musical data, and with this, it is possible to create new musical compositions that in many cases, even manage to be indistinguishable from musical pieces composed by humans.

The Aiva project, which was specifically developed to produce classical and symphonic music autonomously, is an excellent example of AI-produced music. It was trained using a large number of scores from classical composers such as Beethoven, Mozart, and Bach. By reviewing the masterpieces of these great composers, Aiva learned musical patterns and structures that it then uses to create original compositions (Zulic, 2024).

One of the greatest achievements for AI image generation was the fact that Aiva became the first artificial intelligence to be recognized as a composer by SACEM (Society of Authors, Composers and

Music Editors) because in 2016, she released her first album titled Genesis, which was made up of original compositions created by AI. In addition to original compositions, Avia has also collaborated with human musicians to explore new ways of hybrid composition. In these cases, the AI proposes melodies or structures that are then refined and adapted by human composers (Zulic, 2024).

Project Endel, a generative music app that uses AI to create personalized soundscapes in real time, is another prominent example of AI-powered music generation. It aims to help with concentration, relaxation, and sleep and uses artificial intelligence and machine learning algorithms to create music that adapts to different moods, times of day, and activities, such as sleeping, relaxing, or concentrating. Endel creates unique, individualized music for each user and each moment, taking into account variables such as heart rate, weather, date, time, and activity. Endel was the first AI to sign a contract with Warner Music Group in 2019.

One of the main achievements of the Endel project was becoming the first AI to sign a contract with the record label Warner Music Group. Endel, after this partnership, produced a series of purpose-built albums developed by AI, these albums were made to help people improve their quality of life by contributing to their well-being, entertainment and mental health through their productions, thus revolutionizing the scope of machine-generated music by demonstrating that AI can transform the way we use everyday life (Makhmutov et al., 2020).

Image generation

Artificial intelligence can be used to create new digital images or various forms of art automatically from different data sets. A prominent example of this is the DeepArt project, which uses deep neural networks, specifically convolutional neural networks (CNNs). The project is based on a neural style transfer technique, which transforms photographs into works of art by imitating the styles of different famous painters (Gatys et al., 2015). In 2016, DeepArt created a work called The Next Rembrandt, which was presented in several exhibitions and won multiple awards, demonstrating the ability of AI to create art and compete with human creativity. DeepArt is a success story showing how AI can be used in the generation of artistic images; its ability to combine photographic content with the artistic styles of various renowned artists has had a significant impact on digital art (Hassine & Neeman, 2019).

Another important example of AI-generated image creation is the Google DeepDream project. Its initial goal was to improve the understanding of how convolutional neural networks (CNNs) identify, classify, and recognize patterns in images, but it soon evolved into a tool for creating surreal art. Images generated by DeepDream are known for their original and psychedelic style, and digital art creations have already been used in exhibitions and the production of visual material in media such as posters and music videos (Al-Khazraji et al., 2023).

DeepDream has greatly contributed to the popularization of the concept of AI-generated art. It went viral on the internet shortly after its release, attracting the attention of both artists and scientists, and becoming an emblematic case of how AI can be used to generate artistic and innovative images that challenge traditional concepts of art and creativity (Al-Khazraji et al., 2023).

In recent times, numerous companies offer image creation services through artificial intelligence, such as DALL-E, Midjourney, Stable Diffusion, and even design template platforms like Canva (Figure 5).

Figure 5

AI image created in Canva. Source: Own elaboration

Animation

AI has become very popular in the process of using drawings and models to create moving images. Traditionally, this was a process done manually. A notable example is the Dancing with AI project developed by Google AI in collaboration with choreographer Bill T. Jones, which uses various AI techniques such as Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), and Deep Learning (DL), among others. The project utilizes techniques for capturing dancers' movements, which are then processed by AI algorithms that analyze and learn movement patterns. The AI generates animations based on the captured movements, creating dance sequences in real time. One of the most innovative aspects of Dancing with AI is its ability to interact with dancers in real time, allowing for

more dynamic collaboration between humans and machines by adapting the machine-generated movements to changes in human movements (Mapondera, 2019).

Augmented, virtual, and mixed reality (VR, AR, MR)

AR and VR use computer technology to create fully simulated environments or real environments with virtual entities. Augmented reality expands the real world in different layers through devices such as phones, iPads, and AR headsets, while virtual reality immerses the user in an experience that isolates them from the real world using devices such as headphones or 3D glasses.

An important example in the field of augmented, virtual, and mixed reality is the HoloLens project, particularly in the field of medicine and assisted surgery. It allows students to interact with 3D anatomical models in a mixed reality environment. Another significant application is remote collaboration in real time between health professionals in different parts of the world, sharing their field of vision and annotations on 3D objects, thus facilitating real-time consultations during critical procedures (Park et al., 2021).

| *Theoretical reflection on generative artificial intelligence models for image creation: originality in products generated by algorithms*

In recent decades, Artificial Intelligence (AI) has made significant inroads into the creative field, provoking conflicting opinions and controversies regarding traditional notions of authorship and originality, particularly in the case of generative AI models such as Generative Adversarial Networks (GANs), which are capable of creating images that are, in most cases, indistinguishable from those created by human artists. This astonishing ability raises fundamental questions about the nature of creativity and the originality of works generated by these algorithms.

Traditionally, originality has been seen as the ability of authors to generate and express unique ideas in their works. However, in terms of AI, the images it produces are not precisely the product of innate creativity but rather the result of its ability to analyze, interpret, and combine the data with which it has been trained. These images are the product of human knowledge and creativity, transmitted to the AI for processing. This is why, when we question the originality of works produced by AI, the answer is often unclear. Although AI is capable of generating unique works that are technically 'new,' the origin of these creations has always been the result of feeding existing information into the AI. But isn't human knowledge and creativity also the product of the learning we acquire throughout our lives, shaped by the teachings and experiences we encounter over time? If so, then does AI possess some degree of intrinsic creativity?

As AI models are refined, philosophical and ethical implications arise. However, collaboration between humans and machines also emerges, suggesting that instead of seeing AI as a substitute for the human artist, it can be considered a tool that allows for the exploration of possibilities beyond the limits of creativity itself, opening the door for new artistic and scientific proposals and creations. In this context, creativity can arise not only from the artist or the machine but from the interaction between both in a specific project, combining human intuition with the computational capacity of AI.

Impact of Artificial Intelligence on Artistic Creation

Art, as we know it, has continually evolved through the possibilities offered by technological innovations. From the use of the camera obscura and the invention of oil painting to the advent of the photographic camera, it is clear that art is intricately tied to the means of production of its historical periods.

Similarly, art expands through the opportunities presented by new tools. Debating whether traditional art is in danger or may disappear may seem futile. It is undeniable that artificial intelligence is a tool, not an artist.

Attempting to establish hierarchies between the creative outputs of the human mind and the nearly limitless capabilities of artificial intelligence is equally unproductive. Although algorithms—remarkable feats of human intelligence—are programmed to emulate human creativity, they remain subservient to the rules established by their human creators. Art is an exclusively human capacity because it arises from individual impulse and a need for intentional, self-regulated existential order.

Furthermore, a defining characteristic of our human capacity to create art is our finite material existence and our imperfections, limitations, biases, and fallibility. For these reasons, our ability to create art is exceptional, not because we are unique or singular, but because, despite our limitations, we create without external prompts (Figure 6).

Throughout time, art has benefited from the use of available technologies. As these technologies emerge, they are adopted, leading to more efficient workflows, new techniques, and disciplines.

To cite a couple of examples, the representation of perspective during the Renaissance leaped forward thanks to the advantages offered by the camera obscura.

Similarly, the invention of more stable paints with standardized formulations brought the world the convenience of using any color, overcoming the difficulties of mineral or organic component scarcity, transportation issues, or chemical stability.

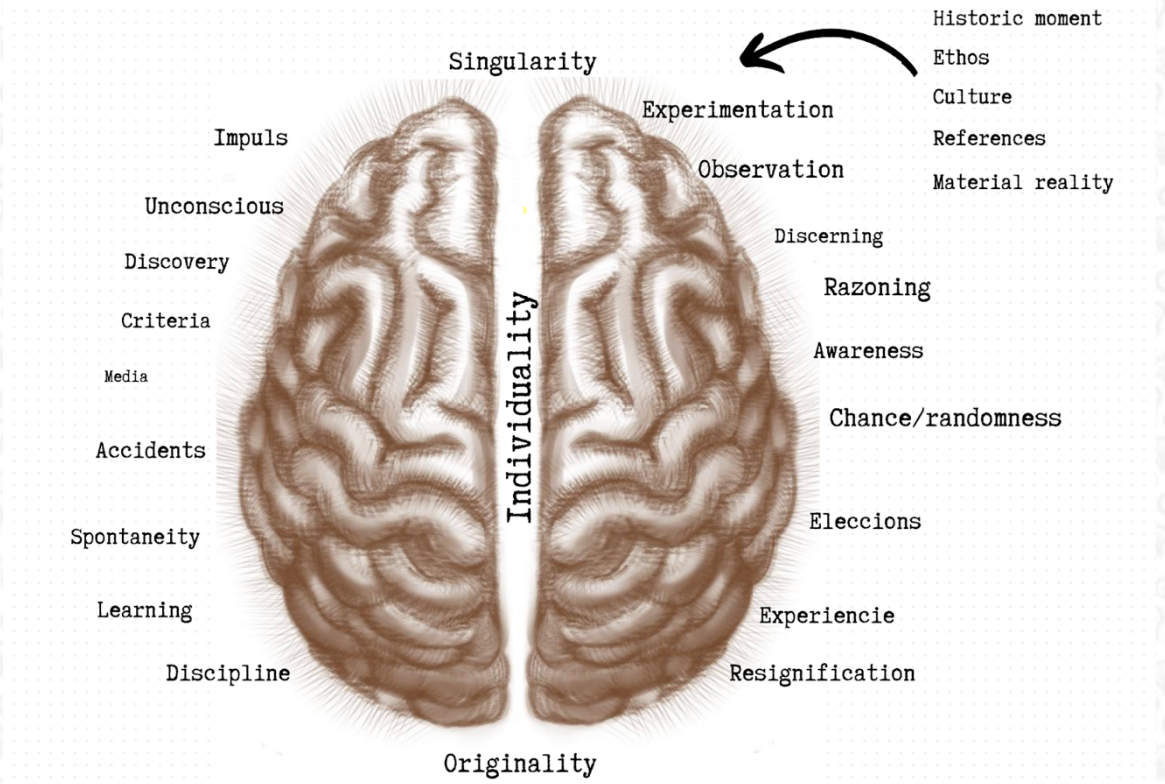
One could now paint outdoors without needing a workshop to prepare paints. The durability of pigments has allowed great works to endure to this day.

The invention of photography, beyond depriving painters of their livelihoods, opened a new branch of art, facilitated the work of painters, and has, in its own right, become a total art form that, in turn, enabled the invention of moving images.

Viewed from this perspective, technological tools represent unprecedented leaps in inventiveness, where human creativity is deposited in new forms and possibilities.

Figure 6

Components of human creativity. A key aspect of human ability to create art lies in our finite material existence along with our imperfections, limitations, biases, and fallibility. This makes our capacity for artistic expression remarkable. Source: Own elaboration



How does the use of AI impact creative works?

The use of artificial intelligence in the creation of artistic products can streamline the development of prototypes or preliminary projects. It can also facilitate the recombination of references and the use of representational models based on the work of established artists. However, an image, video, or musical composition generated by artificial intelligence should not be regarded as an artistic work in its own right, regardless of its technical quality or visual appeal.

As previously discussed, art encompasses human intention and experience, shaped by the choices, backgrounds, and personal contexts of those who engage in the act of creation. Another important aspect to consider regarding the impact of artificial intelligence is the proliferation of replicas or non-original works that masquerade as art or imitate the visual or auditory styles of other artists. This reality is already present; on one hand, we observe the enthusiasm with which the general public adopts these technologies without reflecting on the labor and value of artists' work, and on the other, we witness ongoing legal battles that are redefining the legal frameworks surrounding this issue.

| *Final Considerations*

Artificial intelligence should be used like any other technological tool. Its benefits should be measured based on the capacity to utilize it for achieving specific tasks, such as establishing sketches or preliminary drafts of broader projects, preliminary views, exploring related concepts, and others. The final results produced by generative artificial intelligence should not be used or considered as an artistic work. They should be regarded as proposals, drafts, models, or preliminary projects, and never as works of art, based on the premise that art is a form of knowledge—not only procedural or technical—but also providing highly contextualized information about the psychological, emotional, or intellectual depth of a human being who deliberately makes choices regarding the possibilities they have for creation and makes creative decisions.

The outcome, in this case, the work of art, is a singular, original, personal, unique piece that inherently carries the artist's intent both in execution and creative configuration; and not only that, but it also offers a panoptic view of the world in which that artist lives and how they experience it. The act of creating art lies in the condition of communicative and aesthetic intent. Tools allow us to create as long as we understand how to use them and what possibilities they offer us, such as improving workflow or exploring new possibilities. But before the use of any technology lies a philosophical, critical, or aesthetic foundation that enables its creator to justify a work.

For artists of the Florentine Renaissance, art was closely linked to the concept of invenzione, which refers to originality. According to the dictionary Merriam-Webster, originality is the power of independent thought or constructive imagination (Merriam-Webster: America's Most Trusted Dictionary, n.d.) meaning it results from the inventiveness of its author.

Art is singular in that it emphasizes the quality of exceptional, unrepeatable uniqueness and individuality. Finally, art is very much about that: a fortunate, almost accidental discovery, the product of exhaustive searching, not a protocol of trial and error; rather, one of the variables involved in its creation is the finitude of life and human imperfection. While human intelligence has reached a level where it can create almost perfect machines, humans remain fragile creatures navigating a hostile environment. Our experience of this world expressed through art is much more than a photocopy of that world. The experience of the world permeates us, and therefore, we can create.

An approach is proposed that reconsiders the role of labor and human creativity in art, emphasizing these as a unique and irreplaceable component that adds value and meaning, elements from which creations that form part of humanity's cultural heritage emerge.

Art faculties are now expected to position themselves as platforms for critical discourse within academic institutions, spaces committed to the appreciation of art, the defense of human artistic labor, the recognition of artists' rights, and the valuation of their creative contributions. Critical thinking is essential for developing informed, reflective positions grounded in substantiated knowledge.

A stance of outright rejection towards artificial intelligence offers no tangible benefits. Instead, openness, dialogue, and access to information must prevail to close technological gaps and provide students who are still completing their university education. The integration of new technologies into artistic practices should occur alongside the safeguarding of artistic creation as cultural heritage, considering all that it contributes, what it reveals about the human condition, and the diversity and

plurality it represents. The alternative to automated uniformity lies in the recognition of the uniqueness of artistic works created by human beings through mastery and intentional use of available tools.

What should be the role of art faculties in the use of AI, and what criteria should guide their approach? Academic environments can provide substantiated and verifiable information. In art classes, it can be discussed and emphasized that art is an exclusively human endeavor that has taken advantage of the tools that have emerged throughout history. A critical reflection will allow professionals in training to appreciate the knowledge and tools they are acquiring, and to consider that the creative process is individual, singular, subjective, contextual, and primarily valuable.

Academics have the responsibility to engage in dialogue with other scholars and to contrast theoretical insights with real-world contexts. It is essential to recognize that, as their theoretical understanding deepens, they will be able to provoke meaningful reflections and critical questions about reality, both within and beyond the classroom.

The artist-educator must understand that their role is not to impose a particular viewpoint or predict technological futures, but rather to provide valuable information and to encourage students to explore and experiment within their artistic practices. What is needed is an approach that inspires young learners to expand their reference sources and investigate new possibilities for interdisciplinary artistic creation. The classroom should be viewed as a space for learning through reflection, dialogue, argumentation, and the comparative analysis of data, facts, and case studies.

How can academic programs effectively incorporate new technologies into students' creative processes? Recently, the Universidad Politécnica de Baja California concluded a nationwide process of updating its curricula, specifically influencing the adjustment of the course programs in which the learning of artificial intelligence tools was incorporated into the course contents. The working groups emphasized the relevance of including these technologies so that students can adapt to the challenges and demands of the constantly changing work environment, enabling them to be more competitive and possess the skills that the productive sector demands (Cota-Rivera et al., 2024).

The enthusiasm with which students embrace emerging artificial intelligence tools should be understood as a form of active participation in the transformation of academic curricula and professional competency development. As digital natives, students are eager to share their ideas and experiences. Ultimately, they will graduate into a constantly evolving job market where the threat of significantly reduced employment opportunities looms large.

Within this context, future professionals must be capable of exercising critical judgment, engaging in autonomous learning, and making the most of the opportunities presented by the shifting landscape of the creative industry. Anticipating this scenario requires a clear understanding of the value that a human creative provides, the ability to address complex artistic challenges through experience, sensitivity, authenticity, and originality.

What ethical challenges emerge from using algorithms in artistic creations? Legislations have the enormous task of making the necessary adjustments to defend the original work of artists, protect their rights, and prevent the programming of databases used to train AI algorithms from indiscriminately using images or references from artists without proper respect for their rights (Paiva, 2024). In this regard, some collectives have taken interesting initiatives, such as applications that protect original art by preventing the use of images by AI.

| *Conclusions*

Critical thinking is an essential component for forming informed and reflective positions grounded in substantiated knowledge. A stance of outright rejection toward artificial intelligence offers no tangible benefit.

It is recommended that art schools cultivate in students a well-founded appreciation for artistic creation and promote the recognition of art as a valuable human endeavor. Art faculties should function as spaces for both critical discussion and creative practice, enabling teachers and students to exchange ideas, make use of available tools, and support their perspectives with reasoned argumentation.

Art should be clearly distinguished from AI-generated imagery, with artificial intelligence regarded strictly as a tool rather than a creative agent. Original human work must be valued and protected through legislative advocacy, participation in specialized forums, contributions to academic publications, and ongoing dialogue within art institutions.

| *References*

Acha, J. (2005). *Acha Juan Expresión y apreciación artísticas*. Trillas. https://www.academia.edu/41577364/Acha_Juan_Expresion_y_Apreci

Ackermann, T. J. (2020, November 29). *GPT-3: A robot wrote this entire article. Are you scared yet, human?* https://www.bgp4.com/2020/11/29/gpt-3-a-robot-wrote-this-entire-article-are-you-scared-yet-human/

Aguilera, A. (2024, August 13). *Teoría asociacionista de la creatividad*. Psocología y Mente. https://psicologiaymente.com/inteligencia/teoria-asociacionista-creatividad

Alieva, I. (2023). How American Media Framed 2016 Presidential Election Using Data Visualization: The Case Study of the New York Times and the Washington Post. *Journalism Practice*, *17*(4), 814–840. https://doi.org/10.1080/17512786.2021.1930573

Al-Khazraji, L. R., Abbas, A. R., & Jamil, A. S. (2023). A Systematic Review of Deep Dream. *Iraqi Journal of Computer, Communication, Control and System Engineering*, *23*, 192–209. https://doi.org/10.33103/uot.ijccce.23.2.15

Anantrasirichai, N., & Bull, D. (2022). Artificial intelligence in the creative industries: A review. *Artificial Intelligence Review*, *55*(1), 589–656. https://doi.org/10.1007/s10462-021-10039-7

Ascott, R. (2000). *Art, Technology, Consciousness: Mind@large* (1st ed). Intellect Books Ltd.

Benjamin, W. (2018). The work of art in the age of mechanical reproduction. In M. G. Durham & D. Kellner (Eds.), *Media and cultural studies: Keyworks* (Nachdr., pp. 226–243). Blackwell.

Boden, M. A. (2009). Computer Models of Creativity. *AI Magazine - Wiley Online Library*, *30*(3), 23–34. https://doi.org/aimag.v30i3.2254

Boden, M. A. (2018). *Thinking intelligently about artificial intelligence*. The British Academy. https://www.thebritishacademy.ac.uk/publishing/review/34/british-academy-review-34-thinking-intelligently-about-artificial-intelligence/

Cohen, P. (2016). Harold Cohen and AARON. *AI Magazine*, *37*(4), 63–66. https://doi.org/10.1609/aimag.v37i4.2695

Cota-Rivera, E. I., González Correa, M. E., Bernal Marín, L. A., Marquez Montenegro, M. Y., Herrera, A. M., & Martinez Martinez, M. A. A. (2024). Transforming Education With the Power of Artificial Intelligence: Case Studies. In Ş. Ş. Demir & M. Demir (Eds.), *Advances in Higher Education and Professional Development* (pp. 113–140). IGI Global. https://doi.org/10.4018/979-8-3693-1666-5.ch006

El psicoanálisis, el inconsciente y el arte. (2023, July 25). *Blog del Centro ELEIA*. https://www.centroeleia.edu.mx/blog/el-psicoanalisis-el-inconsciente-y-el-arte/

Esling, P., & Devis, N. (2020). *Creativity in the era of artificial intelligence* (No. arXiv:2008.05959). arXiv. https://doi.org/10.48550/arXiv.2008.05959

FasterCapital. (2024). *Exploración Creativa*. FasterCapital. https://fastercapital.com/keyword/exploración-creativa.html

Ferrer, R. (2018). Mágica belleza. El pensamiento mágico como fundamento original de la teoría del arte [Ph.D. Thesis, Universitat de Girona]. In *TDX (Tesis Doctorals en Xarxa)*. https://www.tdx.cat/handle/10803/664425

Gaki. (2024). *Los Algoritmos de la Creatividad – Laboratorio Gaiki*. https://gaiki.org/los-algoritmos-de-la-creatividad/

González, M. A. (n.d.). *LA CREATIVIDAD Y LA IMITACION EN EL ARTE DEL ENCAJE*. Biblioteca Virtual Miguel de Cervantes. Retrieved February 25, 2025, from https://www.cervantesvirtual.com/obra-visor/la-creatividad-y-la-imitacion-en-el-arte-del-encaje/html/

Goodman, D., & Keene, R. (1997). *Man versus machine: Kasparov versus Deep Blue*. H3 Publications.

Granter, S. R., Beck, A. H., & Papke, D. J., Jr. (2017). AlphaGo, Deep Learning, and the Future of the Human Microscopist. *Archives of Pathology & Laboratory Medicine*, *141*(5), 619–621. https://doi.org/10.5858/arpa.2016-0471-ED

Hassine, T., & Neeman, Z. (2019). The zombification of Art History: How AI resurrects dead masters, and perpetuates historical biases. *Journal of Science and Technology of the Arts*, *11*(2).

Heaven, W. D. (2023). *La IA generativa no necesita ser inteligente para amenazar el trabajo creativo*. MIT Technology Review. https://sitiosfuente.info/ciencias/29864-ia-generativa-necesita-ser-inteligente.html

Horkheimer, M., Adorno, T. W., & Murena, H. A. (1971). *Dialéctica del iluminismo*. Sur Buenos Aires, Argentina. https://www.academia.edu/download/64573897/dialectica-del-iluminismo.pdf

Joseph, S. M., & McGlinn, M. (2002). *The trivium: The liberal arts of logic, grammar, and rhetoric*. Paul Dry Books. https://books.google.es/books?hl=es&lr=&id=lg0a-RJcn4gC&oi=fnd&pg=PR7&dq=The+trivium:+The+liberal+arts+of+logic,+grammar,+and+rhetoric.+Paul+Dry+Books&ots=q6f6THO13f&sig=AEaKXZfmUYR9sbd_9JpNsOoUihY

Lamers, M. H. (2023). A Computer Scientist's View on Machine Learning and Creativity. In C. Anutariya & M. M. Bonsangue (Eds.), *Data Science and Artificial Intelligence* (pp. 325–335). Springer Nature. https://doi.org/10.1007/978-981-99-7969-1_24

Latar, N. L. (2018). *Robot Journalism: Can Human Journalism Survive?* World Scientific.

Makhmutov, M. T., Varouga, S., & Brown, J. A. (2020). Survey on Copyright Laws about Music Generated by Artificial Intelligence. *ResearchGate*. https://doi.org/10.1109/SSCI47803.2020.9308449

Mapondera, M. (2019, May 10). *Dancing with a machine: Bill T. Jones on AI and art*. Google The Keyword. https://blog.google/technology/ai/bill-t-jones-dance-art/

Merriam-Webster: America's Most Trusted Dictionary. (n.d.). Retrieved April 17, 2025, from https://www.merriam-webster.com/

Nake, F. (2019). Georg Nees & Harold Cohen: Re: tracing the origins of digital media. In *Georg Nees & Harold Cohen: Re: Tracing the origins of digital media*. Edition Donau-Universität. https://doi.org/10.25969/MEDIAREP/13340

Newborn, M. (1997). *Kasparov versus Deep Blue*. Springer. https://doi.org/10.1007/978-1-4612-2260-6

Paiva, M. A. (2024, July 7). *La inquietante opinión de Noam Chomsky sobre la Inteligencia Artificial*. La Tercera. https://www.latercera.com/tendencias/noticia/la-inquietante-opinion-de-noam-chomsky-sobre-la-inteligencia-artificial/4ZPWD57F45EWVLX5XUB6QURJMA/

Park, S., Bokijonov, S., & Choi, Y. (2021). Review of Microsoft HoloLens Applications over the Past Five Years. *Applied Sciences*, *11*(16), 7259. https://doi.org/10.3390/app11167259

Shiner, L. (2023). *La invención del arte: Una historia cultural*. Paidós.

Tatarkiewicz, W. (2002). *Historia de seis ideas: Arte, belleza, forma, creatividad, mímesis, experiencia estética* (7a. ed. en la Colección Neometrópolis). Tecnos Alianza Editorial.

Yu, Y., Binghong, Z., Fei, G., & Jiaxin, T. (2020). Research on Artificial Intelligence in the Field of Art Design Under the Background of Convergence Media. *IOP Conference Series: Materials Science and Engineering*, *825*(1), 012027. https://doi.org/10.1088/1757-899X/825/1/012027

Zivanovic, A. (2005). The development of a cybernetic sculptor: Edward Ihnatowicz and the senster. *Proceedings of the 5th Conference on Creativity & Cognition*, 102–108. https://doi.org/10.1145/1056224.1056240

Zulic, H. (2024). How AI can Change/Improve/Influence Music Composition, Performance and Education: Three Case Studies. *ResearchGate*, *2*, 100–114.