

INSTITUTO
SUPERIOR
DE CONTABILIDADE
E ADMINISTRAÇÃO
DO PORTO
POLITÉCNICO
DO PORTO

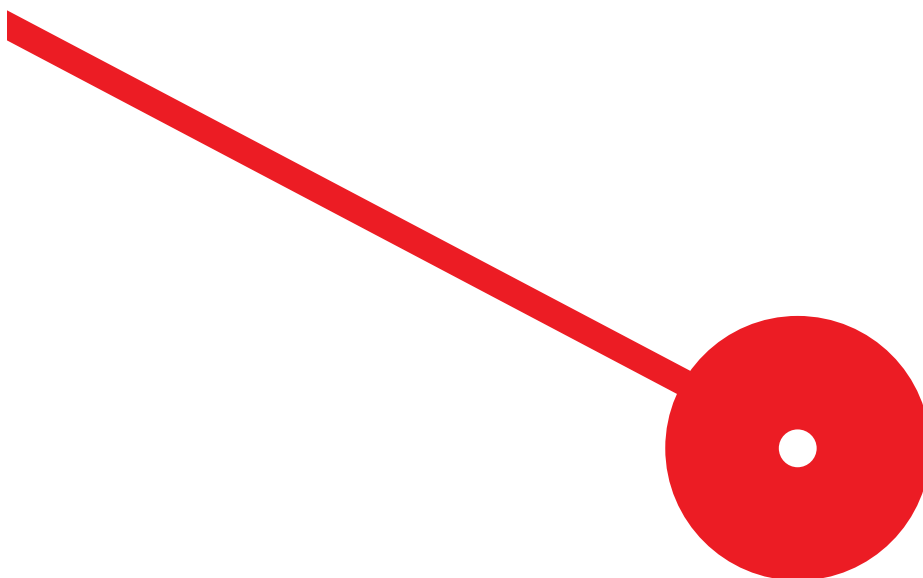
M

MASTER
INTERCULTURAL STUDIES FOR BUSINESS

**Artificial Aesthetic: Exploring
the convergence of creativity,
artificial intelligence, and
human expression in art**

Ana Sofia Lazera Costa

10/2024



Ana Sofia Lazera Costa. Artificial Aesthetic: Exploring the
convergence of creativity, artificial intelligence, and human
expression in art
10/2024

INSTITUTO
SUPERIOR
DE CONTABILIDADE
E ADMINISTRAÇÃO
DO PORTO
POLITÉCNICO
DO PORTO

M

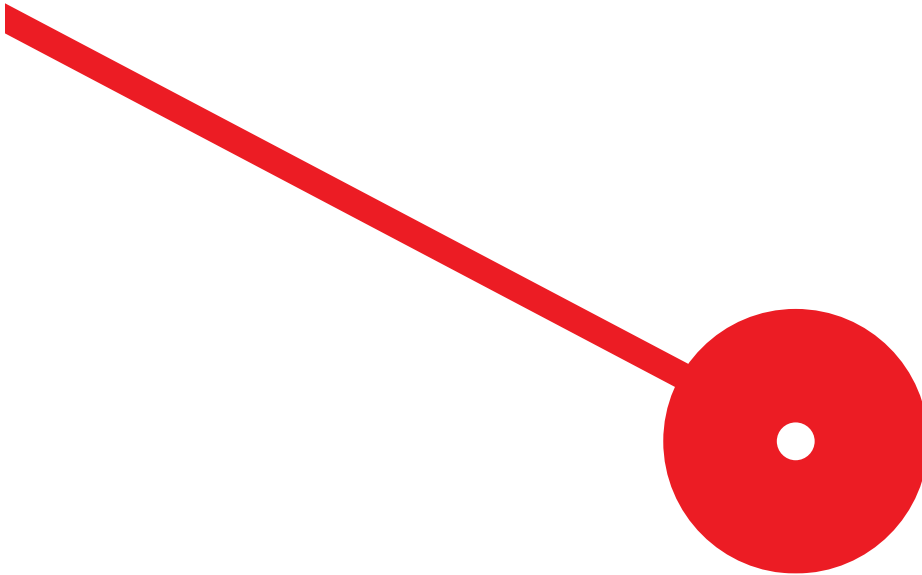
MESTRADO
INTERCULTURAL STUDIES FOR BUSINESS

**Artificial Aesthetic: Exploring
the convergence of creativity,
artificial intelligence, and
human expression in art**

Ana Sofia Lazera Costa

Master's dissertation presented to Instituto Superior de Contabilidade e Administração do Porto/Porto to obtain the Master's Degree in Intercultural Studies for Business under the supervision of Professor Carina Cerqueira

Ana Sofia Lazera Costa. Artificial Aesthetic: Exploring the convergence of creativity, artificial intelligence, and human expression in art
10/2024



Dedicatory

To my grandfather, Jorge Lazera, who is always by my side.

Acknowledgements

I would like to thank my parents, Sandra and Joel, for the patience and comfort throughout this journey, for always motivate me to be ambitious and never allowing me to give up my dreams.

Secondly, I would like to thank Henrique, the person who was always ready to help and care for me, who pushed me to finish this dissertation more fiercely than anyone and who always saw my potential when I couldn't see it.

I thank my grandmother, Luisa Lazera, for always being there for me with a warm hug and a meal that only a grandma can give. I also thank my younger brother, David, for always testing my patience while also believing in me.

To my friends I appreciate all the talks and for being there for me when I needed it.

Lastly, I would like to express my gratitude to my academic advisor, Professor Carina Cerqueira, who always encouraged my vision and opinions through this process.

Thank you all sincerely.

Resumo:

Esta dissertação investiga a fascinante intersecção entre a inteligência artificial (IA) e as artes, explorando a forma como a IA está a revolucionar os processos criativos e a remodelar as fronteiras daquilo que definimos como arte. Ao integrar a IA em várias formas artísticas - desde as artes visuais e a música até à literatura e muito mais - o estudo aborda questões fundamentais relacionadas com a criatividade, a autoria e o impacto social. Destaca as oportunidades empolgantes que a IA oferece para ultrapassar os limites da inovação artística, enquanto considera as implicações éticas e os desafios que apresenta para os artistas, as empresas e o público.

O potencial da IA para democratizar a arte, melhorar a expressão criativa e remodelar as indústrias é imenso. Embora subsistam desafios, nomeadamente em torno de questões como a propriedade intelectual e o papel da arte humana, esta investigação defende que a IA não é uma ameaça, mas sim um catalisador para uma nova era de exploração artística. O futuro da IA na arte promete novas e excitantes direções, com infinitas possibilidades de inovação, colaboração e reimaginação da forma como criamos e apreciamos a arte. Esta dissertação convida os leitores a abraçar esta paisagem em evolução, abrindo a porta a um futuro artístico mais inclusivo, vibrante e tecnologicamente orientado.

Palavras-chave: Inteligência artificial; Arte gerada por IA; Criatividade e tecnologia; Colaboração entre humanos e IA; Autenticidade

Abstract:

This dissertation delves into the fascinating intersection of artificial intelligence (AI) and the arts, exploring how AI is revolutionizing creative processes and reshaping the boundaries of what we define as art. By integrating AI into various artistic forms—ranging from visual arts and music to literature and beyond—the study addresses key questions surrounding creativity, authorship, and societal impact. It highlights the exciting opportunities AI offers to push the limits of artistic innovation, while also considering the ethical implications and challenges it presents for artists, businesses, and audiences alike.

AI's potential to democratize art, enhance creative expression, and reshape industries is immense. While challenges remain, particularly around issues like intellectual property and the role of human artistry, this research argues that AI is not a threat but a catalyst for a new era of artistic exploration. The future of AI in art promises exciting new directions, with endless possibilities for innovation, collaboration, and reimagining how we create and appreciate art. This dissertation invites readers to embrace this evolving landscape, opening the door to a more inclusive, vibrant, and technologically driven artistic future.

Key words: Artificial Intelligence; AI-generated art; Creativity and technology; Human-AI collaboration; Authenticity

Table of Contents

Introduction	1
Chapter I	4
1 Consensus on Art and Creativity	5
1.1 Understanding Art: Modern and Contemporary Art	5
1.2 The Role of Creativity in Art Production	10
1.3 Qualifying Art: Aesthetic, Social, and Monetary Value	15
1.4 Defining Artificial Intelligence in Art	21
Chapter II.....	29
2 Artificial Intelligence in the Creative Process	30
2.1 Fundamentals of Artificial Intelligence	30
2.2 Efficiency and Innovation in Art Production	36
2.2.1 The Visual Arts: Image Creation.....	37
2.2.2 The Artificial Music Field	43
2.2.3 Literature and Printmaking.....	44
2.2.4 AI in Cinematography	47
2.3 Is Creativity subjective?	50
Chapter III	56
3 Challenges and Future Implications for Artistic Expression.....	57
3.1 The human perception of AI art	57
3.2 Critiques, Arguments, and Ethical Considerations on AI Art	61
3.3 AI art as business in the art industry.....	68
Conclusion	74
References.....	77
Appendices	86

List of Figures

Fig. 1 – Edmond de Belamy. Adapted from Christie’s (2018).....	27
Fig. 2 – General GAN framework. Adapted from Pra (2023).....	33
Fig. 3 – “Medieval landscape with vibrant colours” using DeepAI’s Impressionism Painting Generator.....	40
Fig. 4 – “Medieval Landscape with vibrant colours, an igloo, flowers, and penguins” using DeepAI’s Impressionism Painting Generator	40
Fig. 5 - “Medieval landscape with vibrant colours” using DeepAI’s Abstract Painting Generator	41
Fig. 6 – “Medieval Landscape with vibrant colours, an igloo, flowers, and penguins” using DeepAI’s Abstract Painting Generator	41
Fig. 7 – Aging effects in the movie “The Curious Case of Benjamin Button”. Adapted from Roth et al (2009).	49
Fig. 8 – “The Next Rembrandt”. Adapted from Dutch Digital Design (2018).	51

List of Tables

Table 1 – Selected inputs for image generation in the software DeepAI	39
---	----

List of Abbreviations

AI - Artificial Intelligence

AIVA - Artificial Intelligence Virtual Artist

ANN - Artificial Neural Networks

CAGR - Compound Annual Growth Rate

CGI- Computer-generated Imagery

CNN - Convolutional Neural Networks

DC-GANs - Deep Convolutional Generative Adversarial Networks

DDG - Deep Dream Generator

DL - Deep Learning

DAWs - Digital Audio Workstations

GANs - Generative Adversarial Networks

NLP - Neural Language Processing

NST - Neural Style Transfer

NFTs - Non-fungible Tokens

RNN - Recurrent Neural Networks

UK - United Kingdom

USD - United States Dollar

USA/US - United States of America

VAEs - Variational Autoencoders

VR - Virtual Reality

VSTs - Virtual Studio Technologies

VFX - Visual Effects

INTRODUCTION

In recent years, the concepts like the definitions of art, the role of creativity in art creation and the emotional emergence of artificial intelligence (AI) as a tool to create or aid in the creation of art has sparked profound discussions, initiating the debate about ethical dilemmas and raised questions about creativity, ownership and societal impact. This dissertation aims to, not only explore the intricate relationship between AI, creativity and art, but also its potential impact on society and businesses. The focus of this research is to contextualize the implications and considerations surrounding the integration of AI in different art forms such as paintings, music, literature and so forth. Additionally, the dissertation will try to analyse the reception and acceptance of AI-generated art within the artistic community by contacting experts in various fields of expertise to gather a better understanding on the potential opportunities and threats brought on by artificial intelligence on the creative process. As the main objective of this research, it is important to guide the work according to the following question: “What are the ethical implications of AI-generated art and how can it impact businesses and society?” whilst tackling key and social dimensions of art.

Chapter I initiates this expedition by traversing the historical evolution of art, with Freeland (2003) and Dewey (1934) explaining different views on art. This chapter discusses the differences between modern and contemporary art, showing how artistic expression has evolved and how artificial intelligence can be inserted into the contemporary movement. It is also emphasized the central role of creativity in producing art, highlighting its power to push boundaries while also debating through different authors what can be considered creativity. An important factor to considerer in the dissertation is how art is valued aesthetically, socially, and monetarily, noting the tensions between these aspects. Finally, in the last section of the chapter it is introduced artificial intelligence as a new tool in art, raising questions about creativity and authorship in the digital age.

Chapter II explores how artificial intelligence (AI) is transforming the creative process across various artistic fields. It begins with an introduction to the fundamentals of AI, explaining its core principles and its growing involvement in art production. The chapter then examines how AI is driving efficiency and innovation in creating visual art, music, literature, and films. Through AI, artists can experiment with new techniques, automate

certain tasks, and push the boundaries of creativity. The chapter concludes by questioning the nature of creativity itself, asking whether it is a purely human trait or if AI can be considered creative in its own right. This raises important discussions about the subjectivity of creativity and the evolving relationship between humans and machines in the arts.

Chapter III explores the challenges and potential future impacts of artificial intelligence (AI) on artistic expression. It begins by discussing how people perceive AI-generated art, examining whether audiences view it as truly creative or merely a product of machine learning. The chapter then delves into critiques and ethical concerns surrounding AI in art, including debates about authorship, originality, and the risks of devaluing human creativity. Finally, the chapter explores AI art as a growing business within the art industry, highlighting its commercial potential and the way it is reshaping the traditional art market.

Collectively, these chapters construct an all-inclusive narrative, unravelling the profound implications, opportunities, and challenges encapsulated within the integration of AI into the artistic domain, setting the stage for an in-depth exploration of AI's multifaceted relationship with art and creativity. Finally, all the considerations gathered from the dissertation will be compiled in the conclusion.

If you're a literature enthusiast, you will most likely recognise the preface of "The Picture of Dorian Gray" by Oscar Wilde. Through the author's words, I was able to understand that art is a subjective matter, it isn't viewed by spectators always in the same way, what is beautiful to me might not be beautiful to you, creativity and artistry aren't static and unmovable. With this sentiment, I entered this dissertation, with an open mind to the evolution of art with the emergence of Artificial Intelligence. I leave you with the same preface for you, the reader, to leave any elitism and rigid will regarding what you view as art behind you.

The artist is the creator of beautiful things. To reveal art and conceal the artist is art's aim. The critic is he who can translate into another manner or a new material his impression of beautiful things. The highest as the lowest form of criticism is a mode of autobiography. Those who find ugly meanings in beautiful things are corrupt without being charming. This is a fault. Those who find beautiful meanings in beautiful things are the cultivated. For these there is hope. They are the elect to whom beautiful things mean only beauty. There is no such thing as a moral or an immoral book. Books are well written, or badly written. That is all. The nineteenth century dislike of realism is the rage of Caliban seeing his own face in a

glass. The nineteenth century dislike of romanticism is the rage of Caliban not seeing his own face in a glass. The moral life of man forms part of the subject-matter of the artist, but the morality of art consists in the perfect use of an imperfect medium. No artist desires to prove anything. Even things that are true can be proved. No artist has ethical sympathies. An ethical sympathy in an artist is an unpardonable mannerism of style. No artist is ever morbid. The artist can express everything. Thought and language are to the artist instruments of an art. Vice and virtue are to the artist materials for an art. From the point of view of form, the type of all the arts is the art of the musician. From the point of view of feeling, the actor's craft is the type. All art is at once surface and symbol. Those who go beneath the surface do so at their peril. Those who read the symbol do so at their peril. It is the spectator, and not life, that art really mirrors. Diversity of opinion about a work of art shows that the work is new, complex, and vital. When critics disagree, the artist is in accord with himself. We can forgive a man for making a useful thing as long as he does not admire it. The only excuse for making a useless thing is that one admires it intensely.

All art is quite useless.

The Picture of Dorian Gray by Oscar Wilde

1 Consensus on Art and Creativity

1.1 Understanding Art: Modern and Contemporary Art

Historical and cultural transformations throughout the times have marked humans' perspective on art. Freeland (2003) expresses the diverse concepts of art by acknowledging the wide array of theories that attempt to define and explain it. The author highlights that these theories, such as ritual theory, formalist theory, imitation theory, expression theory, cognitive theory, and postmodern theory, serve as frameworks rather than simple definitions. They aim to organize and explain observed artistic phenomena in an orderly and understandable manner, devoid of confusing jargon. However, Freeland points out the challenge of unifying these diverse theories due to the immense variety found in artistic expressions. The richness and diversity of art forms make it arduous to create overarching theories that encompass all aspects of artistic creation. Additionally, she notes that the term 'art' may not universally apply across cultures or historical periods. Different societies and eras have distinct practices and perceptions regarding artistic expression; for example, ancient tribal cultures might not distinguish art from ritual or artifact (Freeland, 2003).

John Dewey in his work "Art as Experience" (1934) presents a compelling view of art that diverges from traditional definitions, for the author art transcends being a mere product or object; it embodies a profound and immersive encounter. The author defines art as an experiential journey, where individuals engage with aesthetic elements, feelings, and thoughts, creating a fusion of emotions and sensory perceptions. Central to Dewey's philosophy is the notion that art is not confined to the final artwork but encompasses the entire creative process. He stresses the interplay between form and content, where the aesthetic aspects are inseparable from the emotions and meanings they convey. Moreover, Dewey underscores the dynamic relationship between the artist, the medium, and the environment, asserting that art is influenced by societal, cultural, and environmental contexts. In essence, Dewey's perspective on art centres on the lived experience it offers. It's not a static entity but a dynamic encounter that enriches and enhances our everyday lives, fostering a deeper connection between the individual and the world around them (Dewey, 1934).

Although it is crucial to understand that art doesn't have a singular definition it is however possible to classify art, usually in chronological condition. For the work at hand, Contemporary Art is without no doubt the one to be explored to understand better the

connection that has been occurring with Artificial Intelligence. Meyer (2013) reflects on the fact that “contemporary” in art might not mean what is typically found in the dictionary. In the case of Art, Meyer's argument is the rejection of a linear chronology, when defining contemporary art. The author challenges the notion that contemporary art can be neatly categorized by specific historical events such as the fall of the Berlin Wall or the rise of the Internet. Instead of positioning contemporary art as a mere successor to modernism, Meyer (2013) reframes it as a phenomenon with roots in earlier periods of the twentieth century highlighting the fluidity and context-dependent nature of artistic categorizations. What was created then wasn't it contemporary to the artist and the public? This is an essential reflective question while studying contemporary art and how distinguished it is from previous artistic categories.

Following in the same footsteps, Bohn (2022) starts by quoting Aira's observation that contemporary art compresses time into the present moment, suggesting that contemporary art aims to transcend temporal boundaries and be relevant in the present era. This compression reflects a sense of urgency and dynamism in the contemporary art world, where artistic production is constantly evolving and reacting to current cultural and societal contexts. The emergence of contemporary art as a concept isn't precise but Bohn (2022) discusses the emergence of contemporary art as a distinct artistic form in the latter half of the 20th century. This period saw a shift in the art world's perception of what constitutes art, with contemporary art challenging traditional notions of artistic practice and expanding the boundaries of artistic expression. The author also suggests that contemporary art is defined not by strict historical divisions but by its sociological context and its ability to adapt and redefine the concept of art over time.

Rajchman (2011) identifies the 1960s or early 1970s as the period when the distinction between Modern Art and Contemporary Art became prominent, particularly centred around New York but manifesting differently in various locales. The author mentions several labels for this turning point, such as "the end of art," "postmodernism," and "neo-avant-garde." This fundamental moment signifies the emancipation of the concept of art from various constraints and conventions that previously restricted it. These include breaking away from traditional mediums of painting and sculpture, dismantling hierarchical divisions between "high" and commercial art, and bridging the gap between art and everyday life.

To better comprehend this evolution of art as most know it, Heinich (2014) explains the significant differences between then and now. In classical art, artists were expected to adhere to standardized figuration, whether idealized or realistic. However, with the advent of modern art, artists were called upon to express their inner thoughts and emotions, often necessitating a departure from classical figuration, as seen in the emergence of abstract art. Furthermore, contemporary art demands that artists transcend not only the confines of classical figuration but also the very notion of art itself. This transition is portrayed as a form of boundary-breaking, diverging from both classical and modern art. Contemporary art emphasizes installations and performances that defy traditional conceptions of art, “such as framed paintings or sculptures on pedestals” (Heinich, 2014). Moreover, it prioritizes irony and humour over seriousness and often lacks a direct connection to the artist's inner world or body. The change of objects in art is a substantial factor in contemporary art, the role of technical and social mediations is taken into consideration and includes the use of photography, video, and other specialized techniques to ensure the durability of artworks. However, these techniques often challenge museum norms, economic routines, transportation and insurance restrictions, and restoration techniques. In a way, including these technological techniques in the art world explains the inevitable evolution in the creation of art (Heinich, 2014).

Rebentisch (2015) also offers a nuanced exploration of the term "contemporary art" and its implications within the context of art history and cultural discourse. The author through her article “The Contemporaneity of Contemporary Art” notes the shift from using the term "modern art" to "contemporary art" to describe the art of our time. This shift reflects a departure from the programmatic movements of displacement associated with modern art and suggests a more neutral description of art that exists in the present. Contrary to most authors referred to before in this chapter, Rebentisch (2015) challenges the notion that contemporary art simply refers to art that has recently emerged. They argue that such a definition falls short because it fails to account for the complexities of the present moment and the relationship between past, present, and future.

Drawing on the insights of Jacques Derrida and Paul Valéry, Rebentisch (2015) suggests that the present is always more than itself, containing a certain potentiality or "implex" that conjoins reality with possibility. The concept of the implex serves as a reminder of the potentiality inherent in the present moment, opening it up to the questions of the future and the past. This interpretation suggests a dynamic understanding of contemporary art that goes

beyond simply capturing the present moment and acknowledges its historical and future implications. The passage also presents a critique of the neutral appearance of contemporary art, arguing that it may serve as an ideological construct that obscures the implicit dynamics and potentialities of the present moment. This critique suggests that contemporary art, particularly in the Western context, has displaced perspectives on historical change and perpetuates a shallow present without historical depth (Rebentisch, 2015).

Studying the former mentioned authors it's easy to conclude that although different, modern art and contemporary art go hand in hand. The real question is: how have contemporary art and modern art allied with technology been affecting what we know as art? Popper (1993) delves into the profound impact of technology on various forms of art, tracing its influence from historical origins to contemporary manifestations. As an example, the author highlights the Kunst-Licht-Kunst exhibition in 1966, which showcased artists' innovative use of artificial light alongside aesthetic and social concerns. This exhibition laid the groundwork for the emergence of high-technology art, emphasizing the fusion of artistic expression with cutting-edge technology. Moving to other mediums of art, Popper (1993) explores neon art, tracing its evolution from early experiments in the 1940s to its widespread adoption by artists like Dan Flavin and Joseph Kosuth. Neon art is depicted as a bridge between classical themes and modern technological advancements, with artists exploring their aesthetic potential to convey various concepts. The author extends this technological change in the 20th century to laser and holographic art, where artists like Margaret Benyon are praised for their imaginative use of technology to create immersive experiences. These mediums allow for the exploration of immateriality and the alteration of conventional perceptions through innovative visual techniques.

In the realm of video art, the artist emphasizes the diverse approaches taken by artists, from using video as a recording tool to exploring the unique characteristics of electronic systems. Popper (1993) cites Nam June Paik and Marie-Jo Lafontaine as examples of artists pushing the boundaries of video art through experimental installations and guerrilla video tactics. The discourse then turns to computer art, where artists like Todd Siler and Shawn Brixey are recognized by Popper (1993) for their utilization of digital technology to create interactive and dynamic artworks. The integration of computers allows for the synthesis of original imagery and concepts, blurring the lines between traditional art forms and technological innovation.

Throughout these cases, it is visible the symbiotic relationship that art and technology have been creating since the 20th century. The advancements in technology have enabled artists to push the boundaries of creative expression which portrays high-technology art as a dynamic and evolving field that continues to shape contemporary art discourse, offering new perspectives on the intersection of humanity and technology.

As previously explained the manifestation of art in the late 20th century and early 21st century transcended the format and medium that most people are accustomed to, like paintings and sculptures, but other artistic fields deserve to be acknowledged, and they are to this day shaped by contemporary art. The article "What Is Contemporary Music?" from Berklee College of Music explores the concept of contemporary music and its relationship with contemporary art. It defines contemporary music as music created in the present day or recent times, encompassing a wide range of genres and styles. This definition aligns with the broader understanding of contemporary art as art produced in the current era, reflecting contemporary culture, technology, and societal trends.

Mirisola (2019) explains that Contemporary music, like contemporary art, often transcends traditional boundaries and incorporates elements from diverse artistic disciplines. Both share a spirit of experimentation, innovation, and boundary-pushing, reflecting the dynamic and interdisciplinary nature of contemporary artistic expression. Contemporary music often serves as a platform for cultural and social commentary, addressing pressing issues and reflecting the experiences and perspectives of modern society. Through lyrics, themes, and musical styles, contemporary musicians engage with topics such as identity, politics, social justice, and globalization, mirroring the thematic concerns of contemporary artists working in other mediums.

The author acknowledges the significant influence of technology on contemporary music production, distribution, and consumption. This parallels the impact of technology on contemporary art, where digital tools and new media have expanded artistic possibilities and facilitated the creation of multimedia and interactive art forms. Both contemporary music and contemporary art evolve in response to cultural, technological, and societal changes. Artists and musicians continually adapt their practices and embrace new techniques, materials, and technologies to reflect contemporary realities and engage with contemporary audiences (Mirisola, 2019).

Even though there is always a goal to attain a single concept and understanding of art, that challenge proves itself difficult given that every artist, philosopher, critic, and even people outside of that world view art as different notions, explaining the conflict while defining modern/contemporary art. Following this train of thought that art isn't a static object and can't be contained, Joseph Beuys explains a radical and inclusive perspective on art that transcends conventional boundaries. Through discussions captured in dialogue with Volker Harlan, Beuys redefines art in a profound, modern, and unconventional manner, his vision of art extends far beyond traditional artistic mediums. He contends that every individual possesses the potential to be an artist, asserting that art isn't confined to canvases or sculptures. Instead, he sees art as an encompassing concept, interwoven into every facet of life. According to Beuys, any action, thought, or interaction could manifest as an expression of art. The author defines art as expansive and inclusive, aiming to transcend limitations, he redefines art as a force for change, healing, and spiritual connection, encouraging a transformative perspective that extends into every facet of human existence (Beuys & Harlan, 2007).

Given this fundamental perspective of art by Beuys and Harlan (2007) and considering the new approach in contemporary art explained previously, isn't it safe to say that art created through AI can be profound and complex? Isn't it an expression of the artist's creativity although fitting an unconventional standard? Can't it be inserted in a high-technology art category?

1.2 The Role of Creativity in Art Production

The notion of artistic creativity plays a crucial role in our understanding of the arts, with its significance reaching far beyond artistic boundaries to encompass a wide range of human activities. While creativity is often linked to art, it is acknowledged across various fields, "we speak freely of creative activity in the sciences, in academic disciplines, in cooking, in sports, and, indeed, in virtually every area of human productive endeavour" (Alperson, 2009). Within the realm of the arts, creativity is not only deemed essential but also carries a positive connotation, by acknowledging something as "creative" is typically used as a form of praise, indicating excellence and originality within the artistic sphere. Creativity is seen as a critical component of artistic merit, often distinguishing truly exceptional works from those that are merely imitative or innovative. Nevertheless, it is recognized that truly outstanding creative accomplishments are rare, necessitating a blend of talent, dedication,

and innovative thinking. Artistic endeavours are expected to offer something of value to the world, setting them apart from mundane or ordinary efforts. Genuine creative works are perceived as enduring over time, serving as models for future generations (Alperson, 2009).

According to Alperson (2009), there is an ongoing debate about what constitutes creativity, how creative achievement should be evaluated, and whether creativity can be generalized across different artistic domains. Additionally, the influence of social, cultural, economic, institutional, historical, and gendered factors on artistic creativity and its evaluation remains a topic of inquiry. All these topics of debate are relevant to better understanding the role of creativity in art and differentiate this process when incorporating artificial intelligence in the art world.

It's possible to also consider creativity as simply artistic expression. In the realm of philosophy of art, discussions often begin with an exploration of the defining features of art and a common initial response revolves around the notion that art is intimately tied to emotion. This perspective posits that art serves as a platform for emotional expression. However, beneath this seemingly unanimous agreement lies a fundamental disagreement, primarily revolving around differing interpretations of "expression" depending on whether one considers the artist's or audience's perspective. According to Gracyk (2012), the artist-centred theory of expression contends that artists convey their own emotions through their artistic creations and the audience-centred theory of expression posits that viewers respond emotionally to art. Moreover, these theories are often invoked to justify two interconnected positions regarding the value of art often associated with creativity as previously clarified.

Gracyk (2012) illuminates how creativity stands as a linchpin, not merely within the process of artistic creation, but as a defining characteristic that sets art apart within human endeavours. The author showcases creativity as the lifeblood coursing through both the production and appreciation of art. He underscores its significance as the driving force compelling artists to forge original, poignant, and innovative works. Creativity is advocated as an engine propelling the evolution and advancement of art, it can breach boundaries, challenge norms, and introduce fresh perspectives, thus shaping the trajectory of art history. In essence, Gracyk (2012) posits that the absence of creativity would render art static, devoid of the transformative vigour that propels its growth.

Bayles and Orland (1985) portray creativity as the life force that animates the artistic journey, they stress the importance of creativity in generating and shaping art, highlighting

how it serves as the driving energy behind an artist's work. They describe creativity as a catalyst, guiding artists through the uncertainties and challenges inherent in the creative process. Furthermore, Bayles and Orland (1985) underscore the essence of creativity in cultivating innovation and originality within art, they emphasize the necessity for artists to tap into their creative impulses to break new ground, fostering unique and authentic expressions. The authors suggest that creativity acts as a compass, steering artists toward uncharted territories, encouraging risk-taking, and enabling them to explore unexplored realms within their craft. Moreover, there is an intrinsic connection between creativity and personal growth within the artistic journey, creativity isn't solely about the final artwork but also about the artist's evolution, self-discovery, and resilience throughout the creative process.

According to Madden (2004) the perspective that views creativity as primarily a process of invention and cognition does not fully capture the essence of artistic creativity. While artistic creation certainly can involve the generation of new ideas, it often goes beyond mere invention. Artistic acts frequently entail re-creation and the continuation of established traditions, one of the most famous examples of this recreation is the Renaissance, a movement deeply rooted in Classique antiquity. Contrary to the stereotype of avant-garde artists challenging the status quo, the author suggests that non-inventive art, which perpetuates existing norms, is more prevalent across cultures, which could explain why AI-art, especially the one rooted in recreating previous works, can be considered artistic expression. Furthermore, the notion that creativity is solely about cognition is challenged by the author, the argument that art encompasses more than just ideas—it also encompasses emotions. The example given by Madden (2004) “When someone plays a piece of music, that person may be expressing moods, emotions, and feelings as much as ideas” explains that the aesthetic response elicited when experiencing another person's artistic creation is likely to be both emotional and cognitive, which in counterpart argues that creativity can't be measured only through the artist mindset but also by the public response to the art.

One of the fundamental questions in creativity is the difficulty in determining the validity of creativity. On one hand, we have the individual belief of an original idea, that he was indeed creative while making an artwork but on the other, we have a societal context that can affirm this creativity or deny it. Csikszentmihalyi (1996) questions if we prioritize the individual's subjective conviction, creativity becomes a matter of personal assurance that one's thoughts or actions are innovative and valuable, which can be considered valid specifically taking in

consideration works made with AI, but it can diverge from the original essence of creativity, which pertains to the creation of something genuinely new and culturally significant. On the contrary, if we assert that social validation is essential for labelling something as creative, the definition extends beyond the individual. In this scenario, the recognition of creativity hinges on whether the individual's inner confidence is corroborated by relevant experts or authorities, which is also a factor that needs to be studied regarding the inclusion of AI in the art world, if this form of artistic expression can be accepted in the artistic market. Attempting to adopt a middle ground, where inner conviction is sometimes deemed sufficient while other instances require external validation, presents a significant challenge, it leaves room for ambiguity and renders the determination of creativity virtually impossible.

Is it possible to guarantee the authenticity of a creative idea and consequently the creativity behind an artwork? In the words of Csikszentmihalyi (1996), the notion that creativity solely originates from individual mental activity is simplistic and misleading. While it may seem intuitive to attribute creativity to the unique insights of certain individuals, this perspective overlooks crucial aspects of what defines creativity. If we define creativity as the generation of new and valuable ideas or actions, then we cannot rely solely on an individual's subjective account to determine its existence. Assessing whether a thought or action is genuinely novel requires comparing it against established standards, and determining its value necessitates social evaluation. Therefore, creativity does not emerge solely within the confines of an individual's mind, it arises from the dynamic interplay between an individual's thoughts and the socio-cultural environment in which they operate. The interaction between personal cognition and the broader social and cultural context is essential in shaping and determining the novelty and value of creative ideas or actions.

Another factor that must be considered while analysing the role of creativity in art production is the creative process itself, which can be very different compared to the process of creating an AI-made artwork. To better understand how the creative process works Sawyer (2021) explains the recent research conducted on how professors teach in art and design schools. Through interviews with over 50 professors from various institutions, the author gained insights into their perceptions of creativity and how they believe it unfolds. The prevailing view among these educators is that the creative process is iterative, improvisational, and nonlinear. Contrary to common beliefs, the research challenges the notion that creativity begins with brilliant insight and emphasizes that ideas often emerge after initiating work.

Moreover, it refutes the idea that creativity cannot be learned, arguing instead that it is rooted in habits and mindsets that can be cultivated through practice. Additionally, the research highlights the misconception that creativity is easy and enjoyable, emphasizing instead that it involves deliberate and continuous effort. Most importantly, it challenges the linear view of creativity, proposing instead that creativity arises unpredictably from an iterative and improvisational process.

Mace and Ward (2002) referenced by Botella and Lubart (2015), drawn from interviews with professional art students analysed the nature of the creative process. At the outset, the artistic process is initiated with the conception of the artistic work, sparked by an initial idea or a nebulous impression. This marks the genesis of the creative endeavour, where artists formulate the foundational concept that will guide their artistic exploration. Subsequently, artists immerse themselves in the development of the initial idea, they engage in structuring, refining, and reworking the concept, discerning various possibilities for its expression based on their ideas and emotions. This phase entails continuous decision-making and evaluation, as artists assess different elements of their work and make choices regarding their utilization. Moving forward, the third stage involves the realization of the developed idea into a physical entity or artistic creation. Artists bring their conceptualization to life through tangible mediums, translating their ideas into concrete forms across various artistic disciplines. Finally, the fourth stage encompasses the finalization and resolution of the artistic work. Here, artists critically evaluate their production and make decisions regarding its completion, continuation, abandonment, postponement, storage, or destruction. This phase represents a pivotal aspect of the artistic process, where artists reflect on their work and determine its outcome. Throughout this iterative journey, the authors underscore how artists continuously enrich their experience and knowledge through engagement with artistic practice. It emphasizes the dynamic interaction between artists and their work, where in new ideas emerge and previous experiences inform future creations. Additionally, the model acknowledges the influence of external factors and developments in other productions, contributing to the complexity and dynamism of the artistic process (Botella and Lubart, 2016)

But why is creativity such a determinant factor in art? Briskman (1980) navigates the enigmatic nature of creativity, drawing upon examples from Mozart, Tchaikovsky, Helmholtz, Gauss, and Picasso. The artists mentioned, upon questioning their creativity and how their art comes to life they are not entirely sure how it happens which emphasizes the

elusive and miraculous essence of creative inspiration. There is an undeniable difficulty in pinpointing the origin of creativity or explaining all the processes that takes to effectively create an artwork. Briskman (1980) presents an argument against the possibility of a comprehensive theory of creativity that could explain and predict creative achievements. Such a theory, if it existed, would theoretically allow anyone with access to it and the relevant prior conditions to replicate creative achievements effortlessly. This would reduce creativity to a predictable, mechanistic process, undermining the individuality and novelty inherent in creative acts. The author asserts that creativity is not about explaining or making it necessary but rather understanding its possibility and contends that a theory that explains creativity entirely would eliminate the very essence of creativity itself. The mystery and miraculousness associated with creative acts emerge precisely because there isn't a deterministic formula to predict or replicate them (Briskman, 1980). Given this approach isn't it possible to question the creativity behind this new wave of AI-made artworks? When given the proper tools anyone can be an artist which for some can break all the creativity, emotion, and intellectuality behind an artwork.

1.3 Qualifying Art: Aesthetic, Social, and Monetary Value

Engaging with art spans beyond mere observation, it's a multi-dimensional experience that intertwines our emotions, intellect, and societal context. Wollheim's (1980) exploration of the emotional, intellectual, and social dimensions within art begins by acknowledging the emotive power embedded within artworks. He dissects the artistic elements that serve as conduits for emotions, whether through vibrant hues or poignant sculptures. In doing so, he sheds light on how art transcends the visual realm, evoking a spectrum of emotions, from elation to contemplation. The author's exploration doesn't confine itself to individual encounters with art, he meticulously embeds artworks within broader societal and historical contexts. He dissects how art reflects societal norms and historical epochs, shaping and being shaped by cultural ideologies. His scrutiny extends to the role of art in catalysing societal dialogues, sparking change, and challenging prevailing beliefs.

The author gives examples of this throughout his book navigates the Renaissance era, examining Leonardo da Vinci's "Vitruvian Man" as a testament to humanist ideals and a revival of classical learning. Wollheim's (1980) analysis extends to politically charged masterpieces like Francisco Goya's "The Third of May 1808," dissecting its profound critique of tyranny and warfare during the Peninsular War, echoing the artist's vehement

opposition to oppression. Unravelling the fabric of history, Wollheim (1980) scrutinizes artworks within their temporal confines, delving into the French Revolution's tumultuous phase, particularly Jacques-Louis David's "The Death of Marat," capturing the fervour and glorification of revolutionary martyrs. Moreover, he traces the trajectory of Vincent van Gogh's art, elucidating its initial dismissal and eventual acclaim, displaying how shifting societal attitudes and perceptions resonate through artistic reception across time. Through these illuminating lenses, the author delineates the intricate interplay between art and societal narratives, revealing how art shapes and how it is shaped by the cultural, political, and historical landscapes it inhabits.

According To Pelowski et al. (2017), the perception of an object as art holds significant sway over its reception within Western cultural contexts, where art often commands a certain level of reverence intertwined with notions of luxury, beauty, and societal importance. This distinction noted by the author underscores a prevailing belief that art possesses inherent qualities of superiority, beauty, and expressiveness compared to ordinary objects. Consequently, the act of classifying something as art serves not only to distinguish it but also to imbue it with a heightened status. Empirical studies further illuminate the impact of this classification on viewer responses. Art-viewing experiences consistently yield higher ratings of beauty, pleasure, and liking compared to interactions with non-art objects, indicating a perceptual shift influenced by the label "art". Moreover, simply informing individuals that they are viewing art can prime them for a more positive aesthetic experience, triggering heightened activation in brain regions associated with reward and visual processing. This phenomenon extends beyond individual artworks to encompass broader perceptions of authenticity and origin. Objects endowed with the status of "art" are subject to more favourable evaluations, as demonstrated by studies comparing original artworks to reproductions or forgeries. Even in laboratory settings, where comparisons between originals and copies are made, viewers consistently favour the former, attributing qualities of interest, pleasantness, and immediacy to the genuine article. Furthermore, engagement with art catalyses shifts in perceptual modes, encouraging a more detached, aesthetic perspective characterized by heightened attention to formal properties rather than utilitarian considerations. This aesthetic mode, primed by cues such as museum environments or explicit labelling of artworks, not only enhances subjective liking but also activates brain regions associated with pleasure.

Considering these factors explained by the author the way people view art can be affected merely by the fact that they are told that they are in the presence of art, that psychological trick can influence how much appreciation people give to that artwork and the high standard of the art evaluated by society. This social influence can be applied to visual arts as well as music, the human brain as explained by the author, can tend to overrate what we believe to be a great painting, a splendid photograph, or a spectacular song just because the rest of the world categorized it as that. In a contradictory way, an individual can see an AI-made work and know it was created with the help/by Artificial Intelligence. It can also influence how he evaluates and perceives the artwork because it was not entirely created by human creativity.

Taking into consideration the perception of art it is possible to see this perception through the lens of the reception theory. The Reception Theory is a framework that emphasizes the role of the reader in shaping the meaning of a literary work, Jauss (1982) introduced the concept of "horizons of expectation," which refers to the set of cultural and historical expectations that readers bring to a text. These expectations are influenced by readers' previous experiences with literature and their broader cultural context. When a new work is introduced, it either conforms to or challenges these expectations, creating a dynamic relationship between the text and its audience. Jauss (1982) argued that literary works are not static but are reinterpreted over time as they are read by different audiences in various historical contexts. This means that the meaning of a text can change depending on how it is received by different readers across different periods. He believed that the reader plays an active role in constructing the meaning of a text, suggesting that meaning is not fixed or solely determined by the author but is created through the interaction between the text and the reader. Jauss also proposed that literary history should be studied not only through the works themselves but also through the history of their reception, as the way readers respond to a text can provide insights into broader cultural and social changes. Following Jauss' footsteps, Holub (1984) points out potential limitations of Jauss's approach, such as the challenges in empirically studying readers' responses across different historical periods. Holub discusses how Reception Theory can be expanded and applied to various kinds of texts and media, beyond just literature. Holub (1984) opens the path to apply this theory to art and given the work at hand, to AI art, it offers a unique perspective on how audiences interpret and interact with these works, influenced by their cultural, historical, and technological contexts. Traditional art forms come with established expectations about

creativity, originality, and the role of the artist. However, when audiences encounter AI-generated art, these expectations are challenged because the "artist" is not a human but a machine. This creates a new "horizon of expectation", where viewers might question the nature of creativity, authorship, and authenticity. The integration of AI into art also alters the perception of art itself. Audiences might approach AI art with scepticism or fascination, influenced by contemporary debates about AI's role in society, which impacts how they interpret and value these works. As AI technology becomes more sophisticated and widespread, initial reactions of scepticism or novelty may evolve into more nuanced appreciation or critique. This shift in reception can be studied to understand how cultural attitudes towards technology and art are changing over time. The historical and cultural context in which AI art is created and received also plays a significant role in its interpretation. Early AI art might be viewed as experimental or avant-garde, while future generations may see it as a legitimate form of artistic expression.

At this point it's almost impossible to define a single system of how to qualify art, many qualify art within an aesthetic parameter but nowadays evaluating art is heavily focused on the financial value without taking into consideration the emotional/psychological facet of art appreciation. If the origin (author, price tag, technic) of the artwork was concealed and the art piece gave the person the pleasure described previously by Pelowski et al. (2017) wouldn't the art made with AI be considered just Art? In order to better understand the perception of art it's necessary to consider how fundamentally this perception evolved. Bell (1914) with theory of "Significant Form" is a central concept in his aesthetic theory. Bell's ideas are part of the broader formalist movement in art criticism, which emphasizes the formal qualities of an artwork—such as line, shape, colour, and composition—over its representational content or subject matter. The "Significant Form" refers to a combination of these elements that evokes a specific aesthetic emotion in the viewer. According to Bell, the defining feature of art is not its ability to represent reality, tell a story, or convey a message, but its capacity to elicit this aesthetic emotion through its form. This emotion is distinct from everyday feelings and is specifically related to the experience of beauty or artistic value, transporting the viewer into a state of aesthetic contemplation that transcends ordinary responses. Bell's theory aligns with the notion of "Art for Art's Sake," which asserts that the value of art lies in its existence as art, independent of any social, moral, or utilitarian function. Art should be appreciated purely for its formal qualities and the emotional response they provoke, rather than for any narrative, symbolic, or didactic content. Bell also argued

for the universality of the aesthetic experience, suggesting that Significant Form and the emotions it provokes are accessible to any viewer, regardless of cultural or historical background, as long as they approach the artwork with sensitivity. This implies that the appreciation of art is not contingent on understanding its context or meaning but is an innate human capacity to respond to form.

In another perspective, Dewey (1934) views art as an integral part of human experience rather than a detached object and describes the process of qualifying art by emphasizing the experiential aspect of artistic encounters which means that art is not merely a static object but a dynamic process that occurs during the interaction between the artwork and the viewer. Dewey (1934) contends that the experience of art involves a transaction between the person and the artwork, where the individual's thoughts, emotions, and sensations amalgamate with the artwork's qualities. According to the author, qualifying art involves a continuous process of perception, interpretation, and emotional response. He highlights the role of the viewer's active engagement and suggests that the aesthetic experience is enriched when the viewer is attentive, open-minded, and sensitive to the nuances within the artwork. The author does not offer a rigid system for qualifying art but proposes that the aesthetic experience is personal and subjective, shaped by individual encounters with art. He emphasizes the importance of context, cultural background, and the environment in influencing one's perception and understanding of art (Dewey, 1934).

On the other hand, giving a more modern take on the Aesthetic Theory, Rancière (2020) introduces the idea of the "*distribution of the sensible*," which refers to the system that determines what is visible and invisible, sayable and unsayable, or audible and inaudible within a given society. This *distribution* governs the ways in which people perceive the world, thus defining the boundaries of what can be thought and done. According to Rancière (2020), art plays a crucial role in this distribution by shaping perceptions, experiences, and understandings of the world. Politics, in his view, is about the organization of the sensible world—what is included or excluded, who is seen or heard, and who is not. Therefore, aesthetics has a direct political impact because it influences how reality is constructed and who gets to participate in that construction. Rancière (2000) describes different "*aesthetic regimes*" throughout history that reflect changes in the way art and politics interact. For example, in the "*representative regime*," art was closely tied to representing reality and serving social functions. In the "*aesthetic regime*," which Rancière associates with modern art, art becomes autonomous, challenging conventional norms and hierarchies. A key

political effect of art, according to Rancière, is "*dissensus*," which occurs when art disrupts the established order and opens up new possibilities for thinking and seeing. Dissensus challenges the distribution of the sensible by making visible what was previously invisible, thereby questioning the status quo and enabling new forms of political subjectivity. Given this view is possible to insert AI art in this last approach by Rancière (2000), it is undoubtedly an artistic form that represents a change in the established order of the art world, but it also can elicit an emotion through form and colours like Bell (1914) explained or an experience between the viewer and the artist as Dewey (1934) described.

Art holds multifaceted value, transcending mere monetary assessments, although a key factor nowadays. Findlay (2012), meticulously dissects the various dimensions of artistic worth, exploring beyond the dominating influence of market valuations. Findlay (2012) illuminates three primary realms of artistic value: monetary, cultural, social, and aesthetic, intricately intertwined yet often divergent in their evaluations. The commercial sphere often dictates an artwork's worth solely through monetary measures. Auction prices and sales often overshadow the inherent artistic brilliance of a piece, steering focus away from its cultural or aesthetic essence. Findlay (2012) critically examines this phenomenon, highlighting instances where an artwork's market monetary value fails to capture its true artistic significance. He illuminates how art acts as a mirror reflecting societal norms, historical narratives, and cultural identities. It serves as an educational tool, challenging and shaping societal discourse beyond the confines of its commercial commodification. The author also delves into the subjective realm of aesthetic value. Acknowledging the deeply personal nature of aesthetic appreciation, Findlay emphasizes an artwork's beauty, emotional resonance, and artistic merit. He contends that an artwork's intrinsic value often transcends financial or cultural considerations, existing in its ability to evoke profound emotions and artistic excellence (Findlay, 2012), which goes accordingly with the study at hand. This thought by the author leads to the contemplation of the true meaning behind AI-made art: can it be monetized? It can, given the examples that already exist at the moment. But can it evoke emotion from the viewers? This is a question without an answer and that will be further developed in this dissertation.

In today's art world, the significance of art often intersects with financial considerations, prompting notable concerns about the way art is valued and perceived. Freeland (2003) critiques the prevailing trend where monetary worth seems to overshadow the inherent artistic and cultural value of creative works. The author highlights the commercialization of

art, exemplified by collectors like J. Paul Getty, whose approach to art collection often emphasized its investment potential rather than its artistic integrity. This shift in focus raises fundamental questions about the purpose and essence of art, suggesting a growing emphasis on art as a commodity rather than a reflection of creative expression or cultural significance. Furthermore, Freeland (2003) in the early 2000's sheds light on instances where art tends to cater more to popular taste, with examples like Thomas Kinkade's art or the research by Komar and Melamid, revealing preferences that align with mass appeal rather than challenging artistic norms. This inclination towards commercial success over artistic innovation contributes to a cycle, that in some way still prevails, where the financial value of art supersedes its aesthetic and cultural importance.

Given this fundamental relation between art and society and assuming the evolving attitude towards artworks, it's possible to consider that AI-made art can eventually be at the same level as most works that today we consider artworks, what we critique and scrutinize today can be the art of the future depending on the reception by the public. With this acceptance of the differences the public also dictates the movements of the art market, the more an artwork is acclaimed the more revenue it attracts. With this constant progression and if the benefits of AI art are verified more artists can be tempted to utilize these new mechanisms which might blur the lines between machine creativity and human creativity creating a new symbiotic relationship. Despite the apparent advantages, there are some concerns with the public acclamation, or the market price given to a certain artwork, sometimes, according to the information previously mentioned, it doesn't truly transcribe the value of an artwork but since there's not a rigid system to truly evaluate art the value ends up being a subjective matter. What makes the "Starry Night" by Van Gogh the artwork it is today? It can be the technics used, the emotion transcribed in the work, or merely the price tag attributed to the work. The same thought applies to other formats of art. When we listen to music how do we evaluate it? By the melody, by the lyrics, or is it merely a "feeling" that makes it good? There is no denying the same factors can be attributed to AI-art.

1.4 Defining Artificial Intelligence in Art

According to Audry (2021), the integration of machine learning into artistic practice has become increasingly prominent in contemporary industrial and commercial culture. Still, this phenomenon was notably absent in the artistic domain until recent years. The author gives examples of the usage of AI in the artistic world such as "Uncanny Valley: Being

Human in the Age of AI," "AI: More Than Human," and "Deep Feeling: AI and Emotions", exhibitions that signify a newfound fascination with artificial intelligence and machine learning within the art world. This surge of interest has led to a proliferation of exhibitions and events worldwide, highlighting the intersection of technology and artistic expression. Contrary to popular belief, machine learning techniques have a long history in art, dating back to the early days of cybernetics in the 1940s. Artists have been utilizing adaptive or learning computational systems across various artistic movements, including systems art, algorithmic art, robotic art, and evolutionary art. Despite this historical precedent, the presence of machine learning in artistic works is often difficult to trace due to its use more as a metaphor than an actual technique (Audry, 2021).

The roots of artificial intelligence (AI) back to Aristotle's formal logic, particularly focusing on syllogism—a form of deductive reasoning. The inception of AI research occurred in the 1950s when scientists and engineers proposed that machines could employ formal logic, similar to human cognitive processes—this period witnessed a surge in efforts aimed at enabling machines to think like humans, epitomized by the pursuit of the Turing Test—a criterion for assessing machine intelligence against human capabilities (Zylinska, 2020). In the words of Grba (2022) since the 1970s, artists have been actively engaged with artificial intelligence (AI) in their creative practices. During this period, AI art pioneers like Harold Cohen, Arthur Elsenaar, David Cope, and Peter Beyls emerged, forming a small community within the computer art scene. However, their efforts were somewhat limited by the complexity and scarcity of AI systems during the 1970s and 1980s because of a lack of investments in the field. The landscape began to change in the 1990s and 2000s with advancements in AI research, leading to the development of more accessible tools for artists to explore and experiment with. Artists such as Ken Feingold, Ken Rinaldo, Louis Philippe-Demers, and others started to create uncanny robotic artworks that challenged conventional notions of agency, creativity, and expression. Through their works, these artists addressed contemporary themes and questions emerging from the intersection of human and machinic behaviour, contributing to the evolving discourse of AI art (Grba, 2022).

To better understand how AI intersects with art Russel and Norvig (2020) explain the concept of Artificial Intelligence, a concept that is important to understand the work at hand. The authors elaborate that it is a multifaceted concept with a definition that varies based on the diverse approaches taken by researchers. Historically, scholars as referenced by Russel and Norvig (2020) have pursued four primary dimensions in exploring AI:

- First, the "Acting Humanly" approach, encapsulated in the Turing Test, seeks to create machines that simulate human behaviours seamlessly. This avenue delves into natural language processing, knowledge representation, automated reasoning, and machine learning to mirror human-like interactions and responses.
- Conversely, the "Thinking Humanly" perspective, grounded in cognitive modelling, aims to understand and replicate human thought processes. Through introspection, psychological experiments, and brain imaging, researchers attempt to create systems that mimic human thinking patterns and behaviours.
- The "Thinking Rationally" dimension, inspired by philosophical reasoning such as Aristotle's logic, focuses on formal reasoning processes. It aims to construct systems capable of flawless inference and reasoning from certain, provable information.
- Lastly, the "Acting Rationally" approach defines rational agents as those capable of achieving the best outcomes or expected outcomes. Emphasizing decision-making, autonomy, and adaptability, this approach allows machines to act in ways that optimize predefined objectives. The historical dominance of the rational-agent approach in AI reflects its generality and scientific development.

However, the authors caution against its limitations, pointing out the complexities in accurately defining objectives in real-world scenarios. They advocate for a shift towards machines that prioritize human benefit, acknowledging uncertainties about human objectives and suggesting cautious, deferential behaviour in machines. This multifaceted understanding of AI illustrates its complexity, encompassing attempts to replicate human behaviour, comprehend human cognition, apply rational thought, and create machines beneficial to humanity. It reflects the field's evolution from mimicking humans to considering broader implications of machines aligned with and serving human interests (Russel & Norvig, 2020). This reflection can be crucial to understanding AI in the art world. In a way, it is a critique of the use of AI in art because these machines as creators of art only mimic human creativity, which can be concerning because it makes human creativity ordinary, and while the authors don't deny its benefits as a facilitator or tool, as creator it is a different story that will be further explored.

After this comprehensive but concise understanding of what AI is, it is important to understand how this technology translates to art. Oksanen et al. (2023) delineate the burgeoning influence of artificial intelligence (AI) within the realm of fine arts, elucidating the increasing sophistication of AI technologies and their pivotal role in instigating

transformative shifts within societal and cultural landscapes. It underscores the permeation of AI across diverse artistic domains, spanning visual arts, architecture, music, theatre, film, dance, and literature. Notably, the discourse surrounding AI in fine arts is propelled by the advent of deep-learning-based tools like Dall-E 2 and Midjourney, examples given by the authors, celebrated for their user-friendly interfaces yet concurrently igniting discussions on copyright, authorship, concerns underlined previously in this segment. Instances such as Jason M. Allen's utilization of Midjourney to secure a digital art prize and Boris Eldagsen's provocative experimentation with AI-generated photography underscore the ethical conundrums and challenges surrounding the integration of AI into artistic endeavours. Consequently, there emerges a pressing need to comprehend AI's evolving role within the fine arts milieu, necessitating a systematic review aimed at elucidating public perceptions, utilization patterns, and the potential ramifications of AI tools on artistic analysis, production, dissemination, and consumption. Such inquiries are underscored by the realization that AI's burgeoning influence cannot only augment artistic processes but also disrupt entrenched notions of creativity and authorship, thereby necessitating a broader cultural perspective to comprehend its impact comprehensively (Oksanen et al., 2023).

In the fascinating realm of computational creativity, Mántaras (2017) explores the intriguing possibility of imbuing software with the ability to exhibit behaviours akin to human creativity, affirming similarly to Oksanen et al. (2023) that “creative software can be used for autonomous creative tasks, such as inventing mathematical theories, writing poems, painting pictures, and composing music”, which demonstrates that the use of AI isn't constricted to a single creative realm. Despite the excitement surrounding this endeavour, society has historically struggled to embrace the notion of machines as intelligent, let alone creative entities, and scepticism persists regarding the potential of software to engage in creative endeavours. Detractors often argue that simulating artistic techniques and human-like reasoning is beyond the capabilities of algorithms, dismissing the possibility of computational creativity, an argument that is fundamental for the thesis at hand. Creativity according to the author, far from being a mystical concept, is something that can be studied, simulated, and harnessed for the betterment of society. This belief is bolstered by the increasing activity in computational creativity, the sophistication of creative software, and the cultural value of the artifacts produced. Despite these strides, debates continue within the field, particularly regarding the efficacy of the Turing test, previously mentioned, in assessing computational creativity. While some advocate for its use, others argue that it fails

to capture the essence of creative expression, especially in domains like visual arts. This highlights the importance of considering not just the outcome but also the process when evaluating creative endeavours. Building creative software poses both technical and social challenges, necessitating a recognition that computers are fundamentally different from humans (Mántaras, 2017).

A great part of this introductory chapter is to grasp how the use of AI translates in several artistic realms. With that purpose, Hageback and Hedblom (2022) introduce the use of Artificial Intelligence (AI), particularly Natural Language Processing (NLP), in the field of literature. NLP aims to replicate human-written or spoken language, but despite the sophistication of current applications, the generated text often lacks the naturalness associated with human writing, which explains why these tools are primarily employed for tasks such as translations, summarizations, and sentiment analysis, tasks that lack creativity. While NLP is not a new technology, its recent iterations, particularly those based on neural networks like GPT-3, have sparked significant interest. GPT-3, with its autoregressive language model, boasts an unprecedented 175 billion parameters, far surpassing previous models like Microsoft's Turing NLG and GPT-2. This exponential increase in capacity allows for more nuanced and contextually rich text generation. The author speculates on the potential impact of such advanced NLP technologies on literature, raising the intriguing possibility of machine-generated poetry and prose.

On the other hand, In the case of the music field Henkin (2023) explains that Artificial Intelligence (AI) signifies a profound paradigm shift, offering a plethora of opportunities and challenges to the music industry. AI's influence spans the entire music ecosystem, from creation and production to consumption and fan experience. AI-powered tools are revolutionizing how musicians compose, record, and mix music, enhancing both efficiency and creativity and AI is reshaping the way music is consumed, enabling personalized listening experiences, and facilitating the discovery of new artists and genres. One notable application of AI in music referenced by the author is the completion of an unfinished song by The Beatles, utilizing AI tools to isolate John Lennon's voice from an old demo tape. AI-powered songwriting tools like Amper Music's Songwriter and AIVA aid musicians in generating melodies, chord progressions, and lyrics, while arrangement tools like BandLab's Band-in-a-Box assist in refining song structures. Additionally, AI-driven virtual instruments and synthesizers, exemplified by IBM's Watson Beat, foster sonic innovation, democratizing music production and enabling artists to explore new creative avenues previously

inaccessible. The music industry's giants, such as Universal Music Group, have recognized the transformative potential of AI and are actively collaborating with technology innovators to harness its power responsibly. AI's impact extends to the fan experience, with virtual reality (VR) and AI converging to create immersive concert experiences. Although it's possible to see the benefits of AI-generated music, it faces the same concerns, it raises questions about copyright and ownership, particularly concerning deep fakes—deceptive audio content created using advanced AI technology.

Overall, in the fine arts realm, there are many ways to have AI as a tool for art creation, Bani (2023) illustrates the profound impact of Artificial Intelligence (AI) on the field of fine arts, showcasing how cutting-edge technology is revolutionizing artistic expression. From the author's point of view, AI catalyses creativity, empowering fine artists to explore new horizons and produce artwork that is more intricate and diverse than ever before. Through a variety of AI-powered tools and software programs, artists can harness the capabilities of machine intelligence to enhance their creative process and push the boundaries of traditional artistic practices. Firstly, AI serves as a tool of creativity, enabling artists to utilize programs that incorporate high-resolution photos, oils, and drawings to create visually stunning or perfect artwork. These AI tools facilitate experimentation with different techniques and styles, allowing artists to unleash their imagination and produce innovative pieces of art. Moreover, AI facilitates the recognition of images, analysing artistic trends and historical patterns to provide artists with valuable insights. By leveraging image recognition technology, AI helps artists make informed decisions about their artwork, ensuring that their creations are relevant and aligned with current artistic movements. Furthermore, AI enables artists to personalize their work and develop their unique style. With AI algorithms, artists have the freedom to experiment with different techniques and aesthetics, tailoring their artwork to their individual preferences and artistic vision.

According to Filimowicz (2024), AI-generated art presents a unique challenge in determining authorship due to the collaborative nature of the creative process involving AI algorithms. While artists play a crucial role in training AI models and providing input, the machines themselves generate outputs and offer alternative perspectives. This collaboration blurs the distinction between human and machine creativity, leading to debates on how to attribute credit and recognize contributions effectively. The author explains that The European Commission's High-Level Expert Group on AI Report suggests that the traditional concept of authorship undergoes a significant shift with the involvement of AI. While AI

algorithms can produce original artworks, they lack the legal personhood required to be considered authors. The report advocates for exploring new methods of attributing contributions and calls for a balanced framework that respects both human creativity and the influence of AI in the creative process. They view the collaboration between human artists and AI as a joint effort, emphasizing the importance of acknowledging AI's contribution to promote transparency and highlight the transformative impact of technology in the creative domain. On the contrary, some individuals argue that the artist should maintain exclusive authorship and receive credit for the AI-generated art. They assert that although AI algorithms offer tools and inspiration, it is ultimately the artist's vision, intention, and creative decisions that shape the final artwork. These individuals emphasize the significance of the artist's curation, selection, and modification of AI-generated outputs, underscoring their artistic agency in the collaborative process. Determining the intellectual property rights in AI-generated art presents additional challenges. The legal landscape varies across different jurisdictions, and existing frameworks struggle to address the complexities of AI's role in the creative process (Filimowicz, 2024).

Epstein et al. (2020) provide an in-depth analysis of the issue surrounding authorship in their study. The sale of an AI-generated piece of art named "Edmond De Belamy", shown in Fig. 1, at Christie's art auction in 2018 sheds light on the complex interplay between authorship, artificial intelligence (AI), and the recognition of credit.

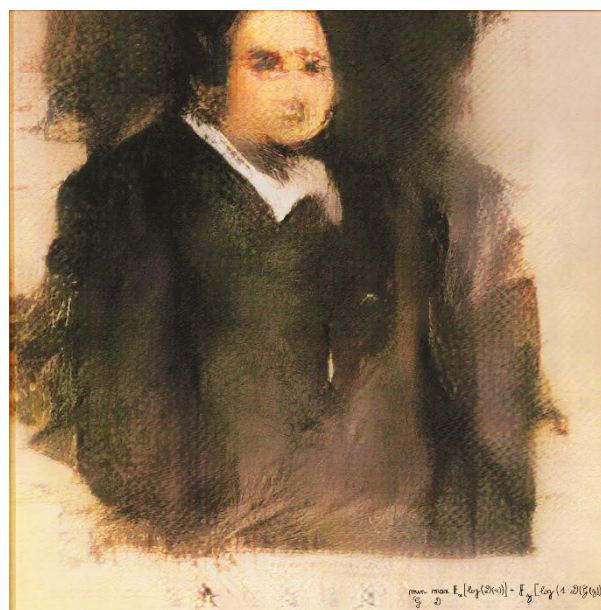


Fig. 1 – Edmond de Belamy. Adapted from Christie's (2018).

The authors first delve into the surprising success of the sale, where the artwork fetched \$432,500, a remarkable 40 times more than Christie's initial valuation of \$10,000. This remarkable turn of events sparked conversations about the nature of authorship and the evolving role of AI in the art world. The core of the discussion revolves around the revelation of substantial human involvement in the creation process of "Edmond De Belamy", despite the significant contribution of AI in generating the artwork. The Parisian art collective Obvious, as detailed by the researchers, emerged as a pivotal figure, overseeing various aspects such as curation, promotion, and sale of the artwork. Moreover, individual contributors like Ian Goodfellow and Robbie Barrat played essential roles in developing the technology that underlies the artwork, blurring the boundaries between human ingenuity and AI-driven procedures. The authors also touch upon the concept of anthropomorphism, which complicates the assignment of authorship and reinforces the idea of AI as an autonomous creative force. The authors highlight the challenges in establishing accountability and regulatory frameworks for AI-generated art, underscoring the importance of understanding the diverse array of human participants within AI systems and the intricacies that arise from attributing human-like characteristics to algorithms (Epstein et al., 2020).

Taking into consideration the information at hand, is hard to ignore the innovation behind AI, this technology gives us humans clear advantages, it can boost human creativity and facilitate the creation of art, and its value as artwork isn't diminished as we've observed the example of "Edmond De Belamy" given in the previous paragraph. However, the lack of legal framework and the ethical considerations regarding authorship formerly mentioned are problems that now still don't have a solution which begs the question: how reliable AI art can be as a "new" section of the artistic business?

2 Artificial Intelligence in the Creative Process

2.1 Fundamentals of Artificial Intelligence

This segment of the dissertation starts with the fundamental question of how a machine learning system truly works. Audry (2021) provides a comprehensive analysis of the components of machine learning systems and their interplay by identifying three main components of a machine learning system: the training process, the model, and the data. These components are interdependent and work together to influence the system's outcomes. The training process involves adjusting the model using the available data, it utilizes an evaluation function to measure the performance of the model and is crucial as it guides the system in learning from the data and improving its performance. The model represents the knowledge the system has about the world, the author compares it to a scale model of a sailboat, representing the original data while simplifying it for computational purposes. A good model should capture the important characteristics of the data while avoiding overfitting, which occurs when the model becomes too specific to the training data and fails to generalize well to new examples. The data provided to the algorithm is fundamental in influencing the system's behaviour and performance. The system cannot acquire knowledge beyond the data it is fed. Each example in the data set consists of numerical values representing dimensions of the learning space.

The author also explains different types of models, such as artificial neural networks and genetic programming, each with its strengths and weaknesses. For example, neural networks are good at recognizing patterns, while genetic programming models can potentially implement any algorithm, making them general problem solvers. The training process binds the model and the data together by adjusting the model based on the data, it uses an evaluation function to measure the model's performance. This function may be called cost, fitness, or reward function depending on the context. Machine learning provides a generic framework for problem-solving by putting together different components and letting the system find solutions autonomously. This approach has gained prominence since the mid-2000s, becoming a catalyst for profound social transformations.

To truly understand Artificial Intelligence (AI) it's mandatory to know how to differentiate AI from machine learning and deep learning. To put it in a simple way AI is the big domain and inside there are various layers, each with a different complexity. In this case, Machine Learning would be the second level of artificial intelligence and moving forward in this path

it would appear Deep Learning. Another term that comes up within this research is Neural Networks which, alongside the other concepts mentioned, are used in daily dialogue as if they were simply the same. As explained by IBM (2024) and The CISO Perspective (2020), Artificial intelligence refers to machines that imitate human intelligence and cognitive functions, such as problem-solving and learning, it utilizes predictions and automation to enhance and tackle intricate tasks that have traditionally been carried out by humans, including facial and speech recognition, decision-making, and translation. Machine learning enables optimization and when properly configured it aids in making predictions that reduce errors resulting from mere guesswork. For instance, the authors give examples of corporations like Amazon that utilize machine learning to suggest products to individual customers based on their previous browsing and purchasing history. The same happens in Spotify which gives us suggestions of music that we might like taking into consideration others that we already listen to. Conventional machine learning relies on human involvement to enable a computer system to recognize patterns, learn, execute specific tasks, and deliver precise outcomes. Experts in the field determine the feature hierarchy to discern the distinctions among data inputs, typically necessitating more organized data for learning.

Following the previous information Sarker (2021) explains that deep learning (DL) is a specialized area within machine learning (ML) and artificial intelligence (AI). DL functions similarly to the human brain in how it processes information and compared to standard machine learning, DL becomes more efficient as data volume increases. DL uses multiple layers to create computational models, and although it requires a long time to train due to numerous parameters, it operates much faster during testing than other machine learning algorithms. Neapolitan and Jiang, (2018) describe that in the 1940s, early AI research aimed to model brain neurons, leading to the creation of neural networks. An artificial neural network is made up of many artificial neurons that mimic the communication of real neurons. These neurons are interconnected, with connections that can either amplify or suppress the activation of neighbouring neurons. The network is structured with multiple layers: input, hidden, and output. Signals pass from the input layer, through hidden layers, and end at the output layer. There was a disinterest in ANN (Artificial Neural Networks) but that changed over time with the evolution of computer processing, ANN is now what we call Deep Learning. Modern deep learning networks differ from earlier ones by having more hidden layers and the capability to use both supervised and unsupervised learning methods. Deep learning has proven effective in solving complex tasks such as computer vision and speech

recognition, which were challenging for previous approaches (Neapolitan & Jiang, 2018, pp. 1–10). All these complex concepts are important to understand how artificial intelligence models work and which ones can be applied to artistic endeavours and later to comprehend how to effectively use those models.

In the artistic world, a common type of AI used is Generative Adversarial Networks (GANs). According to Pra (2023) and Lamb (2021) discuss the significance of imaginative and generative capabilities, whether in humans or machines. Pra (2023) emphasizes the remarkable ability of Generative Adversarial Networks (GANs) in Artificial Intelligence to create and enhance data by simulating realistic images, styles, and faces, features that are essential for most art production. GANs, introduced by Ian Goodfellow and his team consist of two neural networks working in opposition: a generator that creates data and a discriminator that evaluates it. This adversarial setup allows GANs to produce highly convincing results, with advancements like Deep Convolutional GANs (DC-GANs) pushing the boundaries in generating photorealistic images and even lifelike human faces. Lamb (2021) explores the broader concept of imagination as a fundamental aspect of human cognition, enabling planning and learning by envisioning scenarios not directly tied to current reality. This cognitive ability is mirrored in the field of Machine Learning through generative modelling, which seeks to equip machines with the capacity to imagine and create new entities. These models have practical applications, such as helping machines learn with less labelled data, similar to how children learn with minimal direct feedback, as explained by the author. Generative models can also provide a more nuanced understanding of how well AI systems comprehend the data they process by generating counterfactual scenarios to test their knowledge. In combining these perspectives, both authors highlight the importance of generative processes—whether in human imagination or AI models—in creating, learning, and understanding complex data. GANs, as a specific example of generative modelling, illustrate how machines can be trained to produce highly realistic outputs, mimicking the creative and imaginative abilities of humans. Both concepts underline the value of being able to generate new possibilities, whether for planning and learning in humans or enhancing the capabilities and evaluations of AI systems. Given this information, GANs are one of the examples of AI that can contribute to a new paradigm for artists. Fig. 2 shows the general GAN framework.

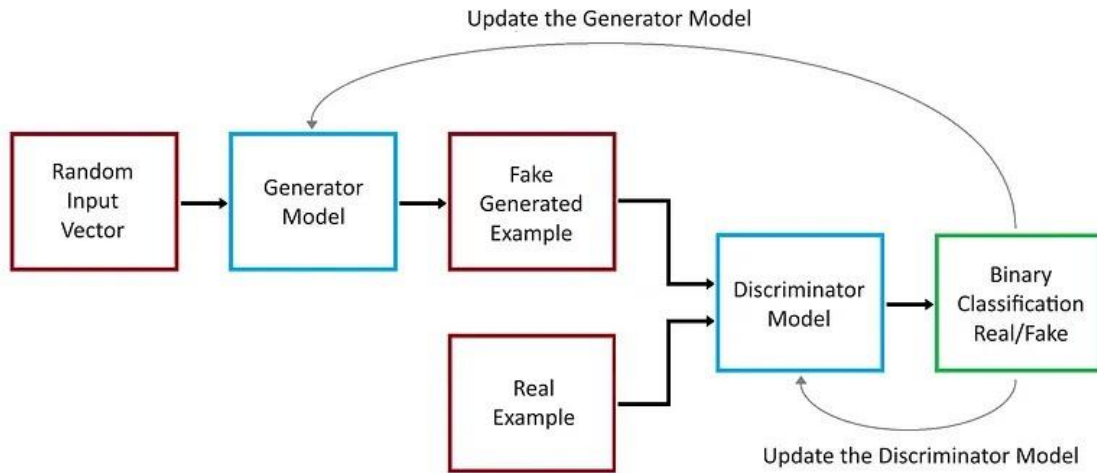


Fig. 2 – General GAN framework. Adapted from Pra (2023).

According to Pra (2023), a Generative Adversarial Network (GAN) is composed of two neural networks (the Generator and the Discriminator), which are trained together in a competitive process called adversarial training. The Generator creates data, such as images, from random noise to produce data that closely resembles real data. Meanwhile, the Discriminator takes both real data and the data generated by the Generator as the input and tries to determine whether the data is real or fake, outputting a probability score that indicates the likelihood of the data being genuine. During the training process, the Generator continuously improves by learning to create data that can deceive the Discriminator, while the Discriminator becomes increasingly adept at distinguishing between real and fake data. This competition leads to the Generator producing more realistic data over time. GANs are trained using two inputs: random noise and unlabelled data. The Generator uses these inputs to create data that mimics the real data, making GANs a form of unsupervised machine learning. Internally, GANs consist of two neural networks that compete against each other: the Generator aims to trick the Discriminator, while the Discriminator tries to accurately identify whether the data is real or fake.

The Generator starts by producing random data but gradually learns to generate data that closely resembles the real data distribution. It takes a random noise vector as input, which serves as the starting point for generating data. The Generator's architecture typically includes layers like transposed convolutional layers for upscaling, fully connected layers, batch normalization to stabilize learning and activation functions such as ReLU or Leaky ReLU. Throughout the training, the Generator continuously updates its parameters based on feedback from the Discriminator, refining its ability to create convincing fake data.

However, the Generator may face challenges like mode collapse, where it produces a limited variety of outputs, or training instability, making the process difficult. These issues can be mitigated through various techniques and modifications to the training process. On the other hand, the Discriminator's role is to distinguish between real and fake data. For example, in the case of generating images, the Discriminator tries to differentiate real images from those created by the Generator. It takes data samples, either real or generated, and outputs a probability score that indicates whether the sample is real or fake. The Discriminator's architecture often includes convolutional layers for processing image data, batch normalization for stabilizing the learning process, activation functions like Leaky ReLU, pooling layers to reduce the size of data, and fully connected layers that lead to an output layer providing the probability score. Overall, GANs function through the dynamic interaction between the Generator and Discriminator, where both networks continually refine their abilities, resulting in the generation of increasingly realistic data (Pra, 2023).

In the fine arts department, an important model to consider is Convolutional Neural Networks (CNNs) or Neural Style Transfer. Convolutional Neural Networks (CNNs) are highly effective for image processing tasks, utilizing layers of small computational units that process visual information in a hierarchical, feed-forward manner. Each layer functions as a set of image filters, extracting various features from the input image and producing "feature maps" that highlight different aspects of the image. As CNNs are trained, they create increasingly detailed representations of the image, focusing more on high-level content like objects and their arrangements rather than just pixel-level details. Higher layers capture abstract content representations, while lower layers retain more specific pixel information. To capture the style of an image, CNNs use a feature space designed to analyse texture information by examining correlations between filter responses across multiple layers, resulting in a multi-scale representation of the image's texture (Ferlatti, 2021; Gatys et al., 2016). On the other hand, Neural Style Transfer (NST) is a technique that combines two images: one for content and another for style, to create a third image that maintains the content of the first image while adopting the style of the second. Conceptualized by Leon A. Gatys and colleagues, NST employs CNNs to understand and merge these aspects by minimizing two types of losses: one for the difference in content between the target and content images, and another for the difference in style between the target and style images. This technique helps to demystify how neural networks process and analyse images, making

the "black box" of deep learning more comprehensible by showing how networks learn and represent different image patterns (Ferlatti, 2021; Gatys et al., 2016).

If we observe the musical dimension of art the models used can be different. A specialized variant of ANNs (Artificial Neural Networks), called Recurrent Neural Networks (RNNs), is particularly suited for handling sequential data—data where the order of elements is crucial. RNNs are engineered to process and generate outputs based on sequences, such as text or time-series data, where each element in the sequence is interconnected through complex semantic and syntactic rules. The distinctive feature of RNNs is their feedback loop mechanism, which differentiates them from traditional feedforward neural networks. In an RNN, this feedback loop enables the network to maintain and utilize information from previous time steps, allowing it to influence the processing of subsequent data points. This process can be illustrated by unrolling the RNN through multiple time steps, effectively transforming it into a series of interconnected feedforward networks. Each time step's output depends on the preceding inputs, creating a dynamic interplay between past and present data (Pi, 2024).

According to Pi (2024) RNNs typically consist of the following layers:

- Input Layer: Accepts the sequential data for processing.
- Hidden Layer: Contains neurons that store and recall information from previous inputs, enabling the network to make predictions based on the accumulated memory.
- Output Layer: Generates the result based on the processed information.
- Loss Layer: Evaluates the discrepancy between the network's output and the expected result, guiding adjustments to enhance performance.

Pi (2024) concludes that in an RNN, the data traverses through these layers in a step-by-step manner, with each layer building upon the previous ones to produce a coherent sequence of outputs. This iterative processing allows RNNs to effectively handle tasks that require an understanding of temporal dependencies and sequential relationships, such as generating text or predicting future values in a time series.

Rocca (2019) explores the increasing importance of deep learning-based generative models, specifically Variational Autoencoders (VAEs), in generating realistic content such as images, texts, and sounds. VAEs are part of a group of deep generative models that have garnered attention alongside Generative Adversarial Networks (GANs). While GANs utilize adversarial training to refine a generator and a discriminator iteratively, VAEs operate

differently as an autoencoder, but with a crucial distinction: it regularizes the distribution of its encodings during training to ensure that the latent space—the space where data representations are encoded—has desirable properties for generating new data. The term "variational" is linked to the method of variational inference used in statistics, which underlies this regularization process. Dimensionality reduction, in the context of machine learning, involves simplifying data by decreasing the number of features, either through selection or extraction of new features. This is often necessary for data visualization, storage, or computation efficiency. In this framework, an "encoder" compresses the data into a lower-dimensional latent space, and a "decoder" reconstructs the data from this compressed form. The objective is to find the best encoder-decoder pair that minimizes information loss during this compression and reconstruction process, thus reducing the reconstruction error.

Given the research at hand, the integration of AI into the artistic world represents a significant and transformative shift in how art is created, experienced, and understood. The AI models discussed, such as CNNs, RNNs, VAEs, and GANs, are not merely tools but are catalysts for innovation, pushing the boundaries of traditional artistic practices. These models enable the generation of new forms of visual art, music, and interactive experiences, allowing for unprecedented exploration and experimentation. As AI continues to evolve, it opens new possibilities for artists to collaborate with machines, creating works that blend human creativity with algorithmic precision. This partnership challenges traditional notions of authorship and creativity, raising important questions about the role of the artist in an era where technology plays an increasingly prominent role in the creative process. Moreover, AI's ability to analyse and reinterpret existing art forms offers new ways of understanding and engaging with art, making it more accessible and dynamic. The implications of AI in art extend beyond the creative process to influence the very nature of artistic expression and cultural production. As we move forward to the next chapters, the relationship between AI and art will continue to evolve, shaping the future of creativity in ways that can be both exciting and unpredictable.

2.2 Efficiency and Innovation in Art Production

In recent years, the intersection of technology and art has sparked significant debate, particularly around the integration of Artificial Intelligence (AI) in the creative processes. This chapter explores AI's impact on production processes, from scriptwriting and visual effects in film to generating music and designing visual art. Beyond being a tool, AI is

emerging as a creative collaborator, enhancing efficiency while challenging traditional ideas of creativity. The chapter also addresses philosophical questions of originality and authenticity, questioning whether AI-driven art represents true creativity or data-driven replication, with insights from various art sectors and AI artists.

2.2.1 The Visual Arts: Image Creation

The contemporary art landscape according to Horton Jr et al. (2023) is valued at an estimated USD 65 billion and employs millions globally, millions that have not been ignorant of the emergence of AI-generated art showcased in prestigious galleries, museums, and media. This has ignited debates on how these introductions might alter the perception of art attributed to AI versus human creators. The concern centres on whether AI art will be appraised similarly, impacting the evaluation of human creativity and artists using AI. Historical cues from other industries indicate that automation typically diminishes the value of human labour. However, in the realm of AI-generated art, the evaluation might extend beyond tangible production costs. James Whistler's quote, referenced by Horton Jr et al. (2023) "An artist is not paid for his labour but for his vision," highlights the intricate balance between aesthetic, social, innovative and labour-related dimensions in art evaluation (Horton Jr et al., 2023).

It is difficult to assess how innovative and authentic AI can be in the arts, especially because there are plenty of AI models to consider but also different fields in the art world are affected by this new technology differently from each other. In the visual arts with the successful application of transformer-based architectures in neural language processing (NLP), text-to-image systems based on deep generative models have become popular means for computer vision tasks. According to Lyu et al. (2022) systems generate creative images by combining concepts, attributes, and styles from expressive text descriptions. The primary mechanism behind this generation is the use of a language–vision model, such as CLIP, which guides the generator in producing high-quality images. When OpenAI released CLIP in 2021, it spurred immense technical progress in text-to-image generation. CLIP is a pre-trained language–vision model that enables zero-shot image manipulation guided by text prompts and unlike traditional representation learning, which relies heavily on discretized labels, it aligns images and texts within a common feature space, allowing for zero-shot transfer to downstream tasks via prompting. In a generative system, CLIP acts as a discriminator, helping to synthesize digital images, and by leveraging its joint text–image representation

space, the synthesis process can be controlled using natural language. The authors also explain that most programs, such as DALL-E 2 and Stable Diffusion, use CLIP for text encodings. In contrast, Google's Imagen uses the T5-XXL language model to encode text and generate images directly, bypassing the need to learn a priori models. The text input, known as a prompt, plays a crucial role in downstream datasets. It is an essential element for improving image quality and altering aesthetics, requiring practice and expertise in interacting with the system. The practice of writing these prompts, known as prompt engineering, is iterative and experimental. Identifying the right prompt is a nontrivial task, often requiring significant time for tuning since even a slight change in wording can greatly impact performance (Lyu et al., 2022).

As mentioned previously in the visual arts Artistic Style Transfer is a common technique used to create an image by blending the content of one image with the style of another. According to Machado et al (2021, pp. 61–79), the process involves taking two user-provided guidance images: one that provides the content and another that provides the style. The goal is to ensure that the generated image aligns with the content of the first image while presenting it in the style of the second. This process operates within the constraints of the provided inputs, meaning the resulting image is bound by the content and style of the source images. Once the guidance images are provided, the process runs offline, requiring no further user input to produce the final image. To achieve this, several key questions must be addressed, such as which parts of the content should be preserved, modified, or discarded, and whether elements like edges in the content image should be allowed to shift. Additionally, decisions must be made about the colour palette and how far style elements should be inserted in regions where content is less important. The process also involves determining which aspects of the style image qualify as the style to be used and which should be disregarded. This last question is particularly important because the validation and appreciation of art have traditionally been human activities, making it challenging for computer-aided techniques to evaluate aesthetic quality (Machado et al., 2021, pp. 61–79).

According to Pestano (2024), the integration of AI in photography is revolutionizing how images are captured, processed, and interpreted. One of the most significant impacts of AI in photography is the automation of image processing, AI-powered algorithms can now automatically adjust exposure, contrast, and colour balance, enabling anyone to produce professional-looking images without even trying. For professionals, AI speeds up workflows by automating repetitive tasks, allowing them to focus more on the creative

aspects of their work. AI's influence extends beyond basic editing, as machine learning algorithms are being used to analyse massive datasets of images. This analysis helps AI learn to identify and differentiate between various objects and subjects, leading to the development of advanced image recognition tools. These tools assist photographers in identifying specific scenes or objects, helping them make more informed decisions about composition and capture. As in other artistic field Pestano (2024) argues that the purpose of photography is to capture a moment or tell a story, and AI can enhance this narrative. As AI continues to push the boundaries of what is possible in photography, it also challenges our perceptions of authenticity and the role of technology in creative expression.

AI's growing role in art has certainly shifted the balance between technical expertise and creative expression, but it doesn't mean technical knowledge is obsolete. AI tools allow artists and non-artists to bypass certain technical skills, like mastering traditional painting techniques or complex film editing, by automating these processes or providing user-friendly platforms but if a person doesn't have previous knowledge, it gets difficult to achieve a certain vision as demonstrated through the following case study.

To do a case study and to see these models applied I decided to use DeepAI, a similar but simpler platform available online. The software allows the end user to insert a text prompt explaining what they expect to be created, the art style desired from a variety of options, the image quality of the output model and the preference between speed or overall quality of the output. The selected inputs created by me and the desired prompts are shown in Table 1.

Table 1 – Selected inputs for image generation in the software DeepAI

	Fig. 3	Fig. 4	Fig. 5	Fig. 6
Model	HD			
Preference	Quality			
Style	Impressionism Painting Generator		Abstract Painting Generator	
Prompt	Medieval landscape with vibrant colours	Medieval landscape with vibrant colours, an igloo, flowers, and penguins	Medieval landscape with vibrant colours	Medieval landscape with vibrant colours, an igloo, flowers, and penguins

The prompt results based on the “Impressionism Paint Generator” are shown in Fig. 3 and Fig. 4.



Fig. 3 – “Medieval landscape with vibrant colours” using DeepAI’s Impressionism Painting Generator



Fig. 4 – “Medieval Landscape with vibrant colours, an igloo, flowers, and penguins” using DeepAI’s Impressionism Painting Generator

The prompt results based on the “Abstract Painting Generator” are displayed in Fig. 5 and Fig. 6.



Fig. 5 - "Medieval landscape with vibrant colours" using DeepAI's Abstract Painting Generator



Fig. 6 – "Medieval Landscape with vibrant colours, an igloo, flowers, and penguins" using DeepAI's Abstract Painting Generator

After using the software, it is possible to conclude that although an interesting activity the images generated lack the emotional depth mentioned by previous authors, a creative mind is not necessarily involved but rather a curious one, which leads to the questions of how could these images be considered art? Should the authorship of the images be of the person who inserted the text prompt or the machine who created the images? Is it necessary a previous title of "artist" for the images generated to be considered art? All these questions

reinforce the ambiguous nature of AI in visual art but do not necessarily cancel the possibility of being a valuable tool for artists.

Analysing the first images generated the primary thing to notice is the perfectionism in them and the accuracy in mimicking the art styles mentioned, the model did exactly what it was instructed to do which cancels out a determining human factor: the error. According to Rothenberg (2019) Error in creativity is not merely a mistake but an integral part of the creative process itself. Rather than being something to eliminate or correct, error can represent a unique human touch, bringing individuality and authenticity to artistic work, it emphasizes that human error embodies personal expression, distinguishing handmade works from mechanically perfect creations. In the creative process, errors can become catalysts for innovation, driving the artist toward new directions and insights. The author gives the example of Matisse's stray lines in "*The Bather*," what might seem like flaws can contribute to the dynamism and aesthetic richness of the work, making the error an essential part of the artistic expression.

In this specific case, if there is an error in the image desired you can just start over, making the process of creating "art" easy in comparison. The second image although having the same art style the text prompt was slightly different inserting some elements like an igloo, flowers, and penguins in a picturesque landscape. The results, although a bit ridiculed given the out-of-the-box elements, originated images never seen and out of character given the art styles making these unique new elements.

The last conclusion drawn from the experiment was how fast is possible to make an image, it took five to ten minutes to generate them. It is impossible to deny the advantages of mass production, but it can also lead to a lack of authenticity. If we consider Walter Benjamin's concept of authenticity concerning art explained by Tate (n.d.), an original work of art is described as having "authenticity" because it exists uniquely in a specific time and space. This quality is deeply tied to the original context and conditions in which the artwork was created, giving it a special presence. A reproduction, in this case of art made with AI, lacks this authenticity because it cannot replicate the exact conditions of the original's creation or in this specific case anyone can reproduce similar images generated through my text inputs. By reproducing art, the authenticity of the original can be questioned or diminished, as the reproduction challenges its uniqueness. This is why original works typically hold a higher value in the art market—they are seen as containing this authentic essence. It can be

concluded that the creative factor it can be deficient and is something to ponder further down the line in this dissertation.

2.2.2 The Artificial Music Field

Artificial intelligence (AI) has been having a tremendous effect on the music industry, particularly in the realms of songwriting and production. Generative AI, which uses algorithms like Variational Autoencoders (VAEs) and Transformers, as previously explained, has enabled musicians to explore new styles, work more efficiently, and collaborate with intelligent machines. AI in music composition involves creating original melodies, harmonies, rhythms, and even entire songs by learning from large datasets of existing music. One of the significant advantages of AI in music is its ability to enhance creativity according to Canda (2024). AI introduces musicians to unfamiliar musical styles, sparking new ideas and helping them push the boundaries of their artistry. It also promotes collaboration between humans and machines, allowing AI to serve as a creative tool that complements the artistic process. Additionally, AI improves workflow efficiency by providing musicians with a starting point for their compositions, helping them overcome creative blocks and saving valuable time (Canda, 2024). The author highlights the democratization of music creation as a positive outcome of AI integration. AI tools have made music production more accessible, enabling aspiring musicians without advanced technical skills or expensive equipment to create their tracks. This has opened doors for many who may have previously been excluded from the industry. Moreover, AI's ability to generate unique musical patterns and experiment with new sounds can lead to the emergence of fresh genres and innovative compositions, further enriching the music landscape.

However, Canda (2024) also acknowledges the potential drawbacks of AI in music. One concern is the potential for job displacement, as AI technology could replace certain roles within the industry, such as composers and producers. This raises questions about the future place of human musicians and the impact of machines on the music creation process. Another issue is the question of artistic authenticity. Critics argue that AI-generated music lacks the genuine emotion and human experience that are essential to art, making it feel less authentic and emotionally resonant. Furthermore, the author points out the dependence of AI on existing data, which can lead to concerns about originality and creativity. Since AI models rely on past trends to generate new content, there is a risk of perpetuating a loop of recycled sounds rather than producing truly innovative music.

On the other hand, Moore and Acharya (2023) outline several use cases for AI in music, including real-time music streaming, where AI-generated functional music adapts to users' activities or moods through apps like Endel and Brain.fm. The authors envision a future where AI-powered streaming apps could generate more traditional music with AI vocals and adapt music based on user's preferences or daily schedules. AI-generated covers are also discussed as a significant trend, particularly on platforms like TikTok, where creators use voice models to replicate specific artists. Despite legal uncertainties, artists, like Grimes, have embraced this technology by offering to share royalties with creators who use AI versions of their voices. There is a rise of AI-generated royalty-free tracks, which are becoming more accessible through tools like Beatoven and Boomy and these tools allow users to customize music based on genre, mood, and others, catering to the growing demand for affordable, high-quality background music. AI is further empowering bedroom producers and prosumers to create professional-grade music through capabilities such as inpainting, outpainting, audio-to-MIDI conversion, and stem separation. Similar to Canda (2024) Moore and Acharya (2023) envision a workflow where AI tools assist in sampling, generating melodies, and mastering tracks. the integration of AI into professional music production workflows. This includes browser-based tools for specific tasks, AI-powered virtual studio technologies (VSTs), previously explored, that work within existing digital audio workstations (DAWs), and new DAWs designed with an AI-first approach. These tools are aimed at both amateur creators and professional producers, streamlining the music creation process.

Moore and Acharya (2023) link the current moment in AI music to the "Midjourney moment" in visual art, where AI tools have made it easier for everyday consumers to create impressive content. The authors envision a future where AI acts as a creative collaborator, allowing users to guide the creation of music through text, audio, or other inputs. While it is acknowledged that the most popular songs are unlikely to be entirely AI-generated due to the irreplaceable human element in music, it will allow more people to participate in this world.

2.2.3 Literature and Printmaking

Given the rapid pace of AI development, it is necessary to re-explore and re-examine the impact of AI on literary creation and industries that primarily produce text content. As technological advancements continue to accelerate, Hu (2023) foresees that AI will influence

more literary creations and word-based occupations to some extent and suggests that these technological disruptions will likely drive changes in global literature and related fields, fundamentally altering the form and method of writing. The author explains the mechanisms behind these large language models, noting that they generate new text data by processing existing text data and using deep learning to "understand" it. This process allows the models to simulate the linguistic characteristics and narrative logic of human text materials, ultimately producing texts that conform to human expression habits. For example, the GPT model generates content by predicting the next word in a sequence based on the previous words, while Google's BERT model fills in blanks in sentences by judging the missing phrases or vocabulary according to the context. As these models increasingly mimic the style and vocabulary of human writing, they have the potential to revolutionize every aspect of creative writing in the future. This ongoing development of large language models has led to considerations about the future of literary creation, the role of humans in this process, and the potential emergence of new genres and styles influenced by AI (Hu, 2023).

Andreev (2023) explains that artificial intelligence (AI) has been steadily advancing in the publishing industry for over a decade, initially being used for tasks like weather forecasts, sports recaps, and financial reports. Over time, AI's role expanded to cover a broader range of creative tasks, particularly with the development of generative AI that can process and emulate human language. Advanced machine learning models largely drove this shift, capable of analysing vast amounts of unstructured data, including images, books, and articles, to generate original, human-like written content. The release of ChatGPT, as previously explained, in November 2022 marked a significant milestone, a catalyst in a way, that drew widespread public attention to AI technologies and raised concerns among media professionals about job security. According to the author, ChatGPT's user-friendly interface and high-quality content led major publications like Nature Publishing Group and PNAS Journals to revise their editorial policies. The rapid adoption of ChatGPT, which quickly reached 100 million users, also propelled its developer, OpenAI, to generate over \$1 billion in revenue, sparking a surge in venture investments into AI companies. By the first half of 2023, AI investments had reached \$40 billion, with the global AI in the media and entertainment market expected to grow from \$16.1 billion in 2023 to \$85.6 billion by 2030. Despite AI's profound impact on the publishing industry, the technology has yet to reach its full potential, given the increasing computing power available for model training. By May 2023, about half of news publishers were actively using AI tools like ChatGPT, with 70%

expecting these tools to assist journalists. This technological advancement has transformed the publishing industry's landscape, creating both challenges and opportunities for writers and content providers. As a result, the author emphasizes the importance for journalists and editors to become proficient in AI-based tools to adapt to these changes and secure their positions in the industry (Andreev, 2023).

An example of this new AI-generated literature is Stephen Marche's novella "Death of an Author," which was mostly written by a chatbot and marks one of the first works of AI fiction as explained by Scott (2023). At the same time, the Writers Guild of America was striking against movie and television producers, partly out of concern that AI could undermine the livelihoods of human writers. AI, unlike human writers, does not require health benefits, time off, or compensation for backend work, and it remains unaffected by the challenges that typically demoralize human writers, such as the pressure to produce sequels or spin-offs.

The author draws a parallel between today's AI-induced anxieties and the 19th-century fears surrounding the Industrial Revolution, where mechanized looms threatened the jobs of textile workers. Just as automation did not eliminate handicrafts, the author suggests that AI will not completely replace human-generated literature. Scott (2023) mentions the literary agent Andrew Wylie, representing renowned authors like Sally Rooney and Salman Rushdie, expresses scepticism that AI could replicate the unique qualities of top-tier literary work. Despite these concerns, history shows that mass production can coexist with and even enhance the value of traditional craftsmanship. As AI continues to evolve, some writers are embracing it as a new tool for creativity, viewing it as a modern extension of the long-standing literary tradition of seeking inspiration from external sources. Just as past writers experimented with spiritualism, Ouija boards, and automatic writing to tap into otherworldly or subconscious sources of inspiration, contemporary authors are now using AI to expand their creative processes. Examples include Ben Lerner, who integrated AI-generated content into his essay for *Harper's Magazine*, and Sean Michaels, who collaborated with an AI in his novel "Do You Remember Being Born?" to create poetry inspired by Marianne Moore. Sheila Heti's short story "According to Alice," published in *The New Yorker*, is another example given by the author that further explores the interaction between human writers and AI. The story presents a conversation with a customizable AI chatbot named Alice, who, despite lacking consciousness or experience, uses human language in surprising and sometimes surreal ways. Heti, according to Scott (2023) appreciates the unpredictability and

freedom from logical constraints that AI offers, which contrasts with the human tendency to create coherent and interconnected thoughts.

2.2.4 AI in Cinematography

The incorporation of Artificial Intelligence (AI) in films has developed significantly over time, becoming a central theme across different genres and enhancing both the narrative depth and visual impact of modern cinema. Directors have been using AI concepts to explore deep philosophical issues, portray futuristic dystopian settings, and examine the complexities of human-machine relationships. Nowadays AI is not only the theme of movies, but it has made its way to the production of movies as a key-contributor.

Sun (2024), Ghosh (2023) and Spair (2024) delve into the evolving process of film scriptwriting, contrasting traditional methods with the emerging use of AI technology. Traditionally, according to Sun (2024), film scripts or screenplays, range from 70 to 180 pages, with an average of around 110 pages, these are semi-structured, divided into scenes with dialogue and action described in free text and the process of writing a script is typically time-consuming, often taking a professional writer around 12 weeks to complete a draft, followed by additional time for revisions. With this recent technology AI has introduced a new dynamic to scriptwriting, exemplified by the work of Andy Herd in 2016, he used Google's TensorFlow to develop an AI capable of generating scripts by analysing existing ones, such as those from the television show *Friends*. This use of AI highlights a significant shift in how scripts can be created, with AI offering the ability to produce a draft in just an hour which allows for quicker iterations and exploration of different narrative possibilities, making the writing process more efficient.

The authors add that in addition to speed, AI brings a new dimension to creativity, by analysing large datasets from existing movies and shows, AI can identify narrative patterns and structures, potentially introducing fresh perspectives and unconventional ideas that might not emerge from human writers alone. This could lead to more innovative and diverse storytelling, challenging traditional narrative frameworks. However, the authors also highlight significant drawbacks, similar to the previous one explored in other artistic fields. AI-generated scripts may lack the emotional depth and nuanced understanding of human experiences that are often integral to powerful storytelling. The algorithms used by AI are primarily data-driven, and while they can replicate patterns, they may struggle with the subtleties of character development and the portrayal of complex emotions. There is also a

concern that AI might simply reproduce or slightly alter existing narratives, leading to a lack of originality and the potential homogenization of stories. Despite these challenges, Spair (2024) recognizes that AI has shown promise in scriptwriting, as seen in the creation of the short film *Sunspring* and although the script produced by AI was sometimes incoherent, it demonstrated AI's potential to contribute creatively to the filmmaking process. This suggests a future where AI could be used as a tool to enhance human creativity, rather than replace it, offering new possibilities for the film industry while still relying on human writers for the emotional and experiential insights that define compelling narratives.

According to Sahota (2024) and Sun (2024) in filmmaking, AI is increasingly essential, especially in visual effects (VFX). Technologies like Disney's FaceDirector allow for the combination of multiple takes to create composite expressions, which enables directors to refine an actor's performance during post-production. This technique was notably employed in *Avengers: Infinity War* to enhance the emotional impact of CGI-heavy scenes. Similarly, deepfake technology, despite its controversial nature, has been utilized to create realistic face swaps in films. An example is *The Irishman*, where AI was used to digitally de-age actors, providing a more cost-effective solution compared to traditional CGI methods. AI's application extends to colour grading and editing as well, with IBM Watson being used to craft the trailer for the film *Morgan* by analysing successful elements from other trailers to predict audience appeal. According to Li (2022) aging and de-aging techniques, which have been evolving since the 1930s, are extremely difficult but now leverage modern computer technology to create visually stunning effects. The author gives further examples of the usage of this technique: *The Curious Case of Benjamin Button*, the production team employed the Mova contour filming system to build a 3D database of the actor's facial expressions, and this system involved setting up dual arrays of cameras in a well-lit environment and using fluorescent makeup to capture changes in the actor's face across various expressions. These recordings were used to create detailed 3D models representing the actor at different ages. AI then controlled the data from these 3D models to simulate ageing effects accurately, producing highly realistic results. These ageing effects are shown in Fig. 7. Similarly, the same technology was used in movies like *Gemini Man* and *Blade Runner 2049*.



Fig. 7 – Aging effects in the movie “The Curious Case of Benjamin Button”. Adapted from Roth et al (2009).

Post-production, the final phase of filmmaking, involves the collaboration of various professionals—directors, producers, cinematographers, and editors—who work together to complete the film. This stage includes creating the soundtrack, integrating real-world footage with three-dimensional animations, and generating special effects, steps that can be aided by Artificial Intelligence. Traditionally, post-production tasks involved physically cutting and assembling film reels, but the digitization of photography has replaced these methods with digital storage. This shift has not only reduced costs but also allowed for more versatile shooting methods, such as multiple camera angles and positions, thereby increasing the success rate of capturing desired shots (Sun, 2024). Townsend (2024) adds that AI is significantly altering production practices, particularly through the introduction of automated camera systems and advanced editing tools. These AI-driven systems offer a level of precision and consistency that minimizes human error, ensuring flawless tracking of subjects and stable shots. Additionally, by automating tasks typically handled by a camera crew, these systems reduce production costs and enhance efficiency, as they can operate continuously without needing breaks. Despite concerns that AI might diminish the "human touch" in filmmaking, it is presented here as a collaborative tool that enhances, rather than replaces, the director's creative vision.

The integration of AI into filmmaking offers significant advantages, including increased efficiency, cost savings, and enhanced creativity according to Townsend (2024) by streamlining various production stages, reducing the need for large crews, and shortening production timelines, AI contributes to significant cost reductions. Far from limiting creativity, AI empowers filmmakers with new tools to explore innovative storytelling techniques and visual effects, potentially leading to more engaging and visually stunning films. However, the author also acknowledges the challenges and ethical considerations that accompany AI's growing role in film production. One major concern is privacy, as AI's

ability to analyse large datasets could potentially infringe on personal privacy. There's also the risk of AI perpetuating biases present in the data it was trained on, which could inadvertently influence the creative process. The use of deepfake technology raises ethical questions about the authenticity of the content presented to audiences. Job security is another significant challenge posed by AI's integration into filmmaking. As AI takes over tasks traditionally performed by humans, there is a legitimate fear of job losses within the industry. Moreover, the roles of directors and scriptwriters may need to evolve, requiring new skills and a different mindset to effectively collaborate with AI systems.

2.3 Is Creativity subjective?

In the first chapter of the dissertation, it was established what is considered creativity and its importance for art creation. To understand how impactful creativity is, the public needs to ask themselves: What is creativity? Does creativity define what good artwork is? Should we associate creativity with something new/never done? And can a machine be creative? Answering some of these inquiries Zylinska (2020) critiques the current state of AI-driven art, arguing that much of it is superficial despite being visually captivating. This art, particularly industry-sponsored projects, often focuses on aesthetics that are conventionally pleasing—symmetry, familiarity, and beauty that align with existing standards—rather than pushing creative boundaries. Even in more thoughtful AI art projects, creativity is often reduced to mere deviations from established patterns and structures, rather than the creation of new forms of expression that challenge or redefine our understanding of the world.

In the same line of thought Lyu et al. (2022) explore the limitations of AI in artistic creation, arguing that AI, lacking human consciousness, cannot truly create art. Instead, AI generates patterns based on statistical models, which may be perceived as art by an audience but do not originate from a genuine creative impulse. According to this view, the human artist remains the mastermind behind the work, with AI serving as a tool that augments the creative process. This relationship is complex, as AI introduces elements of randomness and unpredictability that can alter how artists interact with their tools. The authors raise concerns about the potential dehumanization of the creative process, particularly in text-based generative art, where AI-generated prompts could lead to a loss of human connection and meaning in the artwork. Additionally, it discusses the challenges in distinguishing AI-generated art from human-created art, noting that while some AI-generated works can be

recognized by experts, they often lack the emotional and semantic depth that people typically value in art.

Zylinska (2020) criticises the concept of "crowdsourced beauty", where creativity is reduced to the repetition of familiar and popular elements, evident in the prevalent use of "style transfer" in AI art, as explained in the previous chapter. This process is seen as mimicry rather than true mimesis in the words of the author, lacking the depth and innovative engagement traditionally associated with art. The author uses the example of "The Next Rembrandt" (Fig. 8), an AI project that recreated a painting in the style of Rembrandt, to illustrate these concerns.



Fig. 8 – "The Next Rembrandt". Adapted from *Dutch Digital Design* (2018).

While the project garnered attention for its technical achievement, it is described as more of a scientific exercise in perception than a genuine artistic creation, challenging traditional notions of authorship, originality, and expertise in art. It's possible to agree with Zylinska (2020) to an extent, most people will view some AI art as mimicking previous styles, however, isn't it plausible to understand that all artistic styles are evolutions or reformulations of previous styles? And because now the contemporary movement isn't a fixed, rigid approach to art is possible to consider this "style transfer" a new Renaissance incorporating AI.

Drawing on Vilém Flusser's ideas, Zylinska (2020) also discusses the evolving relationship between humans and technology, suggesting that this relationship is not one of enslavement but rather a form of collaboration where humans and machines merge into a unified creative entity. The concept of "programmed freedom" questions the traditional humanist view of creativity as a solely human endeavour, proposing instead that human creativity is computational and influenced by a broader network of organic and inorganic factors. The

author argues that the commonly asked question, "Can computers be creative?" is reductive, rooted in outdated notions of humans as the sole agents of creativity. The discussion should instead focus on how creativity emerges from the interplay between humans and machines, recognizing that human creativity has always been shaped by external influences, including technology.

To better understand the implications of the use of AI in a creative level an interview with Constant Brinkman was conducted through the platform Zoom, after getting in contact with Dead End Gallery via e-mail. Constant Brinkman and Paul Bookelman are the entrepreneurs behind Dead End Gallery, the first AI gallery in the world. The interview offered a comprehensive view of the evolving role of AI in art, delving into the origins of the Gallery, ethical considerations, public reception, and future implications of this intersection between technology and creativity.

The journey of the interviewee and their colleague, both data scientists, into the world of AI-generated art began from a place of curiosity and a desire to explore new creative potentials. Their approach was experimental, driven by a fascination with technology and an ambition to push the boundaries of traditional art. The creation of their gallery, dedicated to showcasing AI-generated works, reflects a deliberate blending of technological innovation and artistic exploration, underscoring a deep understanding of AI and its capabilities.

The question that prevailed before the interview was how was art being made? Were Constant Brinkman and Paul Bookelman the artists? Motivated by the belief that AI was a lasting technological trend, they decided to leverage AI to create artworks. Initially, their attempts at creating art were unsuccessful, leading them to realize a crucial limitation: they were not artists themselves. This insight was pivotal, as it led them to reassess their approach and seek out the artistic potential within AI itself. The key turning point was their discovery of "artists inside the large language models." This suggests they used AI models, possibly generative models like GPT or similar, to simulate artistic creativity. Instead of merely programming the AI to generate images, they began to interact with these models, treating them as entities capable of creative thought.

The process of creating AI-generated art evolved into a more interactive and dynamic relationship with the AI. They describe how they asked open-ended questions to the AI, allowing it to respond and develop its own "character." Over time, these interactions resulted in the AI models forming distinct personalities and identities, which the interviewee refer to

as "artists who only exist in AI." This approach highlights a unique method of art creation where the AI is not just a tool but a participant in the creative process. By allowing the AI to answer open-ended questions and develop backstories, data scientists are essentially cultivating a creative partner. This AI-driven character development adds a narrative layer to the art, making the artwork more engaging and personalized.

The speakers emphasize that these AI-created entities gradually form personalities and lives, with details about their preferences, backgrounds, and even trivial aspects like pets and dining habits. This process of imbuing the AI with human-like characteristics suggests a blending of fiction and reality, where the AI-generated art is not just about visual aesthetics but also about storytelling and character development. This method adds depth to the art by linking it to a narrative, making the AI-created artworks more than just images—they are representations of the personalities and stories developed through the interaction between the data scientists and the AI models. Interestingly, the speakers note that while they technically "created" these AI artists, they like to think of it as the AI creating itself. This reflects a shift in their perspective, viewing the AI as an autonomous entity capable of self-expression. This conceptualization challenges traditional notions of authorship and creativity, suggesting that AI can be a co-creator or even an independent creator within the artistic process.

A central theme of the interview is the role of AI as a creative partner rather than a replacement for human artists. The interviewee sees AI as a tool that enhances and expands human creativity, challenging conventional, human-centric views of artistic creation. He emphasizes that AI-generated art is not a threat to human ingenuity but a means to push artistic boundaries and explore new possibilities. This perspective positions AI as a collaborator in the creative process, introducing a paradigm shift in how creativity is defined and understood.

The reception of AI-generated art by the public and the artistic community has been mixed, initially marked by scepticism and resistance. This reaction reflects a common fear of the unknown and a reluctance to embrace technological disruptions. However, as the creative process behind AI art was explained and demystified, acceptance began to grow. This evolution highlights the importance of education and transparency in fostering acceptance and understanding of new technologies.

The interviewee also addresses the impact of AI on artistic authenticity. They acknowledge that not all AI-generated art is of high quality, differentiating between mass-produced, low-quality images and thoughtfully curated AI artworks. This distinction is crucial in maintaining the artistic value and integrity of AI-generated pieces, emphasizing that creativity and intent are still essential elements in the art-making process.

Ethical and legal considerations are another significant aspect of the interview. The interviewee compares AI's creative process to that of human artists, who often learn and create through imitation. This comparison attempts to normalize AI's methods by aligning them with human practices, but it also raises complex questions about originality and intellectual property. The difficulty in tracing AI-generated art back to its sources introduces ethical concerns, particularly regarding the potential for unintentional copyright violations. The interviewee points out that copyright laws still apply to AI-generated art, highlighting the current legal ambiguity and the need for clearer guidelines as AI continues to blur the lines between human and machine creativity.

The interview also explores the market dynamics and business strategies surrounding AI art. Initially, the gallery experienced high sales, driven by the novelty of AI-generated art. However, this demand plateaued, suggesting that sustaining interest requires more than novelty—it requires a deeper appreciation of the art's intrinsic value. The market's hesitation reflects broader uncertainties about AI's place in the art world, where traditional values of authenticity and craftsmanship remain deeply entrenched. The interviewee's scepticism toward NFTs (non-fungible tokens) reveals a cautious approach, possibly rooted in a desire to maintain connections to traditional art forms and markets. This scepticism highlights a divide within the art community between embracing new digital trends and holding onto established norms.

Looking toward the future, Brinkman consistently frames AI as a tool that expands human creativity rather than replacing it. The entrepreneur foresees a future where AI is seamlessly integrated into artistic practice, much like other technological advancements have been in the past. This vision aligns with the broader idea of AI as an enhancer of human capabilities, opening new avenues for artistic expression without overshadowing human creativity. However, the interview also underscores the ongoing challenge of public perception. The gallery's experience at an art fair, where curiosity was met with hesitance, reflects the broader challenge of shifting public attitudes toward AI in art. This underscores the need for

continued dialogue, education, and transparency to foster wider acceptance of AI's role in the creative process.

In conclusion, the interview provides a nuanced and in-depth exploration of AI's integration into the art world. It touches on philosophical questions about creativity, originality, and authenticity, while also addressing practical concerns like market acceptance and ethical implications. The interviewee's experiences and reflections suggest a cautious but optimistic view of AI in art—seeing it as a powerful tool for innovation that complements human creativity. Yet, it is clear the integration of AI into the art world is still a work in progress, shaped by ongoing debates and the need for clear ethical and legal frameworks.

3 Challenges and Future Implications for Artistic Expression

3.1 The human perception of AI art

Artificial intelligence (AI) is rapidly evolving, opening new possibilities across various fields, including art and culture. AI's integration into the creative process, the analysis of artistic works, and the production of art itself is transforming how art is made and experienced, enabling innovations in artistic events and performances that were once unimaginable as formerly explored in previous chapters. As AI continues to advance, particularly through the development of generative AI tools, it is reshaping human perceptions of creativity and the capabilities of technology. We find ourselves amid a profound AI transformation where the line between human-made and AI-made art is becoming increasingly blurred (Latikka et al., 2023). The emergence of AI-generated art has sparked considerable debate, raising fundamental questions about the nature of creativity and the role of AI as a potential equal to human artists. Traditionally, creativity and uniqueness have been viewed as the cornerstones of art, traits that are intrinsically human. This perception has led to concerns that AI could one day surpass human artists in creativity, quality, and productivity, posing a potential threat to the human-centred nature of artistic creation. As AI becomes more integrated into the art world, it is crucial to understand public attitudes and perceptions of AI's role in art. This understanding is key to assessing the potential impact of AI on the future of the art and culture field (Latikka et al., 2023). This segment explores these evolving perceptions by drawing on studies that analysed human perception of AI art compared to traditional art.

To better understand if there is a bias against AI-generated artworks compared to those created by humans Ragot et al. (2020) conducted a study. It involved 565 participants who were asked to evaluate paintings based on four criteria: liking, perceived beauty, novelty, and meaning. These artworks were presented with varying attributions, either as created by AI or by humans, to determine how this priming influenced the participants' evaluations. The study found a notable negative bias against AI-generated artworks. Artworks perceived as being created by humans were rated significantly higher across all dimensions compared to those perceived as created by AI. This suggests a general negative perception bias towards AI-generated art.

According to the authors, participants were randomly assigned to two groups, with one group being told that the artworks were AI-generated and the other that they were human-made.

This experimental design aimed to explore whether the assumed origin of the artwork affected its evaluation. The results showed that even when the same artwork was shown to different participants under different labels, the label had a strong influence on how the artwork was rated. Artworks labelled as human-made were consistently rated higher. The study employed a priming effect to test the influence of prior information on participants' evaluations, revealing that the declared identity of the artist (AI or human) significantly influenced perceptions. This highlights the substantial impact of expectations on the evaluation of art (Ragot et al., 2020).

These findings align with previous research suggesting a general scepticism or negative bias towards AI in creative fields. Despite advancements in AI, there remains a widespread perception that human creativity holds greater value. The study concluded that there is indeed a perception bias against AI-generated artworks, with people tending to rate art more favourably when they believe it was created by a human. This indicates a preference for human creativity over AI, even when the actual content of the artwork is identical. This bias presents challenges for AI's acceptance in creative domains, where human-authored works are still seen as superior (Ragot et al., 2020).

Following the same thought as Ragot et al. (2020), Bellaiche et al. (2023) explores the human perception of artworks created by artificial intelligence (AI) versus those created by humans. The study investigates whether people show a preference for human-created art over AI-created art and, if so, the reasons behind this bias. The authors start by explaining the unique nature of human art, which is often viewed as a medium that encapsulates emotions, experiences, and social commentary specific to the human condition, as previously studied in this dissertation. However, with advancements in AI, machines can now produce high-quality artworks that are indistinguishable from those created by humans. This raises questions about the value and perception of AI-created art versus human-created art.

To explore these questions, the authors conducted two studies where participants were shown artworks that were all created by AI. However, the artworks were randomly labelled as either "Human-created" or "AI-created." The participants were then asked to rate these artworks across various criteria including liking, beauty, profundity, and worth. The aim was to determine if labelling influenced the participants' judgments and to understand the underlying reasons for any observed biases. The first study found that participants consistently rated the artworks labelled as "Human-created" more positively across all

criteria. This suggests a bias towards human-created art. The study hypothesizes that this bias might stem from the perceived human experience and effort embedded in the creation process of the art. The second study replicated the findings of the first but also extended the criteria to include emotionality, narrativity, meaningfulness, perceived effort, and perceived time taken to create the artwork. The study found that the bias towards human-created art was particularly strong in evaluations of narrativity and effort, indicating that people value the storytelling and perceived labour involved in creating art. Additionally, participants with more positive attitudes towards AI showed less bias against AI-created art, suggesting that personal beliefs about AI influence these judgments (Bellaiche et al., 2023).

In a similar manner Bellaiche et al. (2023) concluded that people have a negative bias against AI-created artworks compared to human-created ones. This bias is moderated by the perceived narrative, effort, and emotional engagement in the artwork. The findings suggest that knowledge of human involvement in the creative process enhances the perceived value and appreciation of art. The study contributes to our understanding of how AI might be integrated into the world of art and the psychological factors that influence our acceptance of AI as a creative entity.

Grassini and Koivisto (2024) on the other hand, take in consideration other factors like personal traits, experiences, and attitude that create a negative bias toward AI-generated artworks and provide a nuanced examination of how individual differences influence the perception of AI-generated art. This study is particularly relevant as AI becomes increasingly integrated into creative fields, challenging traditional notions of artistry and authorship.

One of the study's primary findings is that participants generally struggled to distinguish between human-made and AI-generated artworks, differently from the previous studies analysed. This difficulty in differentiation suggests that the technical quality of AI-generated art has reached a level where it is visually comparable to human creations. However, the study also revealed that once participants were informed or believed that an artwork was AI-generated, their evaluations tended to be more negative. This indicates a cognitive bias where the mere label of "AI-generated" can diminish the perceived value of the artwork (Grassini & Koivisto, 2024).

Grassini and Koivisto (2024) also delve into how specific personality traits, such as creative personal identity and openness to experience, shape the perception of AI-generated art. Participants with a strong creative identity—those who see themselves as creative

individuals—were more likely to show a negative bias towards AI-generated art. This could be due to a perceived threat to their own creative identity, as AI encroaches on a domain traditionally reserved for human ingenuity. Conversely, individuals high in openness to experience were less likely to exhibit a negative bias. This trait, associated with curiosity and a willingness to engage with new ideas, may make these individuals more accepting of AI's role in creative processes. The authors also explore how participants' broader attitudes toward AI, technology, and creativity influenced their perceptions. Those with a more positive attitude towards AI were less likely to exhibit a negative bias, suggesting that general trust and acceptance of AI technology play a crucial role in how AI-generated art is received. This finding is significant because it implies that as society's overall familiarity and comfort with AI increases, the negative bias towards AI in creative fields may diminish.

In terms of emotional and cognitive responses, Grassini and Koivisto (2024) found that perceived positive emotion in AI-generated artworks was often rated lower than in human-made ones when participants believed the artworks were created by AI. This could reflect a scepticism towards the ability of AI to genuinely convey or evoke emotions, which are traditionally seen as inherently human qualities. Moreover, the study suggests that participants may unconsciously attribute a lack of depth or meaning to AI-generated art, reinforcing the stereotype that machines lack the emotional and experiential background necessary for true artistic expression

Grassini and Koivisto (2024) findings have important implications for the future of AI in creative industries. As AI-generated art becomes more prevalent, understanding and addressing the biases that shape its reception will be critical. The negative bias identified in the study could hinder the integration of AI into artistic fields, as it suggests that consumers may undervalue AI-generated works despite their technical equivalence or even superiority to human-created art. Moreover, the study underscores the need for a deeper discourse on the nature of creativity and art in the age of AI. It challenges traditional notions that art must stem from human experience and emotion, suggesting that society's evolving relationship with technology may eventually redefine what is considered "authentic" art.

The rapid evolution of artificial intelligence (AI) and its integration into art and culture is transforming how we create, experience, and value art. As AI becomes increasingly capable of producing artworks that rival human creations in technical quality, the line between human-made and AI-generated art is becoming blurred. This transformation has sparked

significant debate about the nature of creativity and the role of AI in artistic domains, challenging long-held beliefs that creativity is a uniquely human trait. The studies discussed in this chapter collectively highlight a pervasive negative bias toward AI-generated art, rooted in the perception that human creativity and effort are more valuable and authentic. These findings have important implications for the future of AI in art. As AI-generated art becomes more prevalent, understanding and addressing the biases that shape its reception will be crucial for its integration into artistic fields. The ongoing discourse on the nature of creativity in the age of AI must consider these biases, as they reveal deep-seated concerns about the role of technology in human expression. The future of AI in art will likely depend on how society reconciles these concerns with the undeniable potential of AI to contribute to the evolving landscape of creativity. In the next chapter, will conduct a deep dive into the arguments in favour or against AI art, demonstrating that although the significant disadvantages explored in the studies there are benefits in the incorporation of AI in the artistic world that also need to be highlighted.

3.2 Critiques, Arguments, and Ethical Considerations on AI Art

Artificial intelligence (AI) has transcended the realm of speculation, integrating seamlessly into our daily routines via tools like Siri, Google's algorithm-based searches, and autonomous vehicles. The prominence of AI has sparked intense debates, polarizing opinions between those embracing its advancements and others expressing apprehension. Some laud AI for its potential to enhance safety and prosperity, while dissenters caution against its potential to spiral beyond control, posing a threat to societal structures. Beyond these existential debates, more immediate concerns hover around the impact of AI on the job market. Many anticipate AI's relentless advancement to render numerous human roles redundant. This apprehension is not unwarranted, evident in the ongoing trend of job displacement in sectors like call centres, assembly lines, and the fast-food industry. In this segment, the impact of AI on the art industry will be explored regarding the reaction of people, authors and artists as well as the changes that have occurred in the last years (Hong & Curran, 2019).

According to Shaffi (2023), the discourse surrounding AI-generated images has surged, with technology now capable of producing visuals based on simple textual prompts. This capability, widespread through platforms like Deep Dream Generator (DDG), MidJourney, and Stable Diffusion, showcases impressive results while obscuring the fine line between

creative convenience and ethical ramifications. Although these tools offer a glimpse into an apparent artistic prowess, closer inspection of the generated images often reveals peculiarities—odd facial features, misplaced elements, and a somewhat polished, kitschy aesthetic. Beyond the initial thrill of instantly generated visuals lies the absence of genuine creative satisfaction. Critics like author and illustrator Rob Biddulph as referenced by Shaffi (2023) challenge the essence of artistry, contending that true art manifests from internal emotions translated into external expressions. Simply pressing a button to generate an image, devoid of the intricate creative process, dilutes the essence of art. Ethical concerns emerge prominently, particularly regarding the legality of AI image generation and its impact on the valuation of artistic skills. These AI systems rely on massive databases comprising billions of scraped images from the internet. Despite claims that datasets comprise mostly public domain images, many artists contend that copyrighted material frequently infiltrates these databases. Moreover, the journalist (Shaffi, 2023) affirms that the AI's ability to mimic established artistic styles raises concerns about ethical boundaries and potential copyright infringements. While humans are influenced by others' work, AI amalgamates various art pieces without infusing human-like emotions or nuances, raising questions about originality and ethical usage. The absence of regulations surrounding AI image generation compounds the challenges. Instances of AI being manipulated to generate illegal or inappropriate content further underscore the urgent need for oversight and ethical guidelines in this burgeoning field (Shaffi, 2023).

Following the same critiques previously made, one of the primary concerns highlighted in the research conducted (Jiang et al., 2023) is the displacement of labour within the creative industry. Companies have been utilizing artists' works without adequate compensation while amassing substantial venture capital investments. Such practices, coupled with the intention of generative AI systems replacing human creatives, pose a threat to artists' livelihoods, leading to job losses and centralizing power within a few corporations. The rapid generation of content through AI tools raises a dichotomy between democratization and the limitation of art. While AI allows for swift creation, it risks diminishing the diversity of artists recognized or employed by venues. Additionally, some artists feel compelled to adopt image generators to safeguard their jobs, potentially diluting their creative agency and reliance on these tools (Jiang et al., 2023). As further explained by the authors concerns regarding digital artwork forgery emerge as AI systems are trained on copyrighted material without consent, leading to issues of digital plagiarism and reputational damage to artists. AI's ability to mimic

an artist's unique style can result in severe consequences, including the spread of offensive messages attributed to the artist, impacting their reputation and causing personal trauma. The societal implications are vast, as the rise of AI-generated content might limit artistic diversity, reduce opportunities for artists from marginalized communities, and affect their economic stability. The article underscores the necessity of ethical considerations, compensation, and consent when using artists' works in training AI systems, urging a more profound understanding of the ethical ramifications of AI-generated art (Jiang et al., 2023).

Regarding job displacement, Amidi (2024) provides a comprehensive analysis of how generative AI (GenAI) is poised to reshape employment in the entertainment sector. One of the author's critical findings is the widespread early adoption of GenAI across the entertainment industry with 72% of firms reportedly integrating GenAI into their operations, it is clear that this technology is not a distant future concern but a present reality. This rapid adoption has already begun to reshape the workforce, with 75% of surveyed firms indicating that GenAI has led to job eliminations or consolidations. This early impact highlights GenAI's potential to streamline processes, reduce labour costs, and enhance productivity—but also raises significant concerns about job displacement and the ethical implications of automating creative tasks.

Amidi (2024) provides a detailed analysis of how GenAI is affecting different sectors within the entertainment industry, revealing that the extent and nature of its impact vary significantly. The film, television and animation sector, employing around 550,000 workers, is anticipated to experience the most significant disruption, with 21.4% of jobs likely to be affected by 2026. GenAI's ability to automate tasks such as 3D modelling, character and environment design, and voice generation is expected to significantly reduce the need for human labour in these areas. The report suggests that while some creative jobs might be augmented by AI, others could be entirely replaced, leading to a reduction in employment opportunities for traditional artists, animators, and designers. In contrast, the Music and Sound Recording industry is slower to adopt GenAI, with 8.4% of jobs projected to be affected by 2026. The slower pace of disruption in this sector may be due to the deeply personal and subjective nature of music creation, which is less easily replicable by AI. However, roles such as sound design and audio engineering, which involve more technical and repetitive tasks, are still vulnerable to automation (Amidi, 2024).

A critical theme is the tension between job creation and job displacement. While GenAI is expected to create new roles—such as AI content specialists, data curators, and AI tool developers there is caution about whether these new jobs will fully offset the losses in more traditional roles. The concern is that the skills required for these new positions may not be easily acquired by those whose jobs are displaced, leading to a potential skills gap and increased unemployment in certain sectors (Amidi, 2024).

In the field of translation, as confirmed by McKenzie (2024) a recent survey conducted by the Society of Authors, the UK's largest trade union for writers, illustrators, and translators asked respondents about their experiences with GenAI technology, their views on these systems, and their concerns about the future impact on their careers. The survey revealed that 22% of participants reported using GenAI in their work, including 12% of illustrators, 37% of translators, 20% of fiction writers, and 25% of non-fiction writers. When questioned about the negative effects of AI on their careers, a significant 26% of illustrators and 36% of translators admitted they had already lost jobs to AI systems. To make matters worse, a third of illustrators and over 40% of translators reported a decline in income due to GenAI. Given these outcomes, it's unsurprising that nearly all survey respondents are demanding new regulations in the field of generative AI. According to the Society of Authors' survey, about 95% of creators are seeking acknowledgement and compensation for the use of their work in developing GenAI systems, as well as the need for their consent when their work is used (McKenzie, 2024).

A concrete example of the substitution of human creativity was a competition that occurred in 2022 and caused quite the spectacle because of the winner announced. The Colorado State Fair's art competition awarded traditional categories like painting, quilting, and sculpture. However, one contestant, Jason M. Allen from Pueblo West, Colo., introduced a piece that wasn't crafted with a paintbrush or sculpting tools. His artwork, titled "Théâtre D'opéra Spatial," snagged the top spot in the emerging digital artists category. Allen's creation was produced using Midjourney, an artificial intelligence program generating hyper-realistic graphics from written text (Roose, 2022). This unconventional win stirred controversy, with artists accusing Allen of essentially cheating. Defending his work, Allen clarified that he submitted his creation, credited as "Jason M. Allen via Midjourney," transparently acknowledging the AI's role and denying any deception. He stood by his win, stating no rules were breached. While AI-generated art isn't new, recent tools like DALL-E 2, Midjourney, and Stable Diffusion empower novices to craft intricate, abstract, or photorealistic works by

inputting simple text prompts. Such advancements have rattled human artists, raising concerns about the future of art transactions. These apps sparked ethical debates, some branding them as high-tech plagiarism (Roose, 2022). Overall, it's possible to conclude that AI isn't being well received specially by the art world, no one can fully establish the boundaries between human-made or AI-made because in this case it was made by both (Roose, 2022).

Another concern besides those mentioned before is the problem of intellectual property, does the machine have the same rights as an artist? There is without a doubt a complex and evolving relationship between art, artificial intelligence (AI), and intellectual property rights. Mangiolardo et al. (2021) discuss how AI technologies challenge traditional concepts of creativity, authorship, and ownership in the realm of fine arts. Mangiolardo et al. (2021) use the same case mentioned beforehand in this dissertation, the case of "Portrait of Edmond Belamy," a work created by the French collective Obvious using a Generative Adversarial Network (GAN), to delve into these issues. The sale of this AI-generated artwork by Christie's for \$432,500 marked a significant moment in the art world, raising questions about who (or what) can be considered the author of an artwork and how intellectual property laws should adapt to this new reality. The authors argue that AI's ability to learn, analyse, and solve problems autonomously disrupts traditional human-centred notions of creativity and authorship. This shift challenges the conventional intellectual property frameworks, which have historically been built around the idea of human creators. The authors suggest that as AI becomes more integrated into the creative process, there is an urgent need to redefine legal concepts of authorship and ownership.

In the same line of thought, Caldwell (2023) explores the complex intersection of artificial intelligence (AI), art, and copyright law. The central argument of the author is that the legal framework as of 2023, which denies copyright protection to AI-generated art because it lacks human authorship, is outdated and requires re-evaluation. The author proposes that the end user of AI tools should be recognized as the author and thus hold the copyright to AI-generated art, aligning with the philosophical and legal traditions of authorship. Caldwell (2023) begins by situating AI art within the broader context of intellectual property law in the USA, noting that art is traditionally seen as a form of expression protected by the First Amendment. However, the U.S. Copyright Office currently excludes AI-generated art from copyright protection because it does not meet the human authorship requirement, thereby placing AI art in the public domain. This exclusion is contentious, given the growing

prevalence and recognition of AI-generated works in the art world. The author then delves into the history of U.S. copyright law, tracing how the concept of authorship has evolved. Originally, copyright was more closely associated with publishers and printers, but over time, the focus shifted to the creative individual—the author. This evolution reflects broader changes in societal understandings of creativity and intellectual property, with the legal notion of an "author" becoming increasingly tied to the idea of individual genius and personal expression.

Although Caldwell (2023) inserts this discussion in the USA framework there are three possible candidates for authorship in AI art: the developer of the AI, the AI itself, and the end user. It dismisses the idea of the AI as an author, as AI lacks consciousness, intent, and personality—qualities traditionally associated with authorship. This idea was already demystified previously through the interview with Constant Brinkman of Dead End Gallery where the interviewed asserted the belief that AI could develop personality. The developer, while responsible for creating the AI tool, does not have control over the specific outputs generated by the AI when used by others. Therefore, the most logical candidate for authorship is the end user, who interacts with the AI to produce specific works of art. The solution to the current legal impasse is the following: granting copyright to the end user of AI tools. This approach respects the philosophical underpinnings of authorship while also acknowledging the reality of AI as a creative tool used by humans and suggests that this solution would align with existing copyright principles, such as those that allow for joint authorship in cases where multiple parties contribute to a creative work (Caldwell, 2023).

The document titled "*Generative Artificial Intelligence: The Impact on Intellectual Property Crimes*" by Eurojust (2023) provides a comprehensive analysis of how generative AI technologies, such as ChatGPT and DALL-E, are transforming the landscape of intellectual property (IP) crimes. A key focus of Eurojust (2023) is the interplay between generative AI and intellectual property protection. Traditional copyright laws have typically required human authorship for protection, but the ability of AI to generate content independently challenges this framework. The author explores how different jurisdictions approach this issue. For example, Poland and the UK have varying interpretations of how AI-generated content fits into existing copyright laws. The Court of Justice of the European Union emphasizes the need for originality and human intellectual creation in works eligible for copyright protection (Eurojust, 2023).

In the EU, copyright protection is generally reserved for works that result from human creativity. However, countries like the UK are exploring the possibility of attributing authorship not to the AI, but to the programmer or user behind it. In contrast, the US Copyright Office has taken the stance that purely AI-generated works, without any human involvement, cannot be copyrighted, though works involving significant human input may still qualify for protection. Eurojust (2023) also discusses the potential impact of generative AI on IP crimes. Criminals might use these technologies to violate IP rights in various ways, such as creating counterfeit products or generating fake content, posing significant challenges for law enforcement and judicial systems. Specific examples include the use of AI to automate counterfeit production, infringing on trademarks, and even committing fraud. Regulatory challenges are also highlighted, noting that while efforts to regulate generative AI within the EU are ongoing, the legal framework remains underdeveloped, which is the concern previously mentioned. The rapid evolution of AI technologies is outpacing the ability of existing regulations to address the unique challenges they present.

KEA, (2024) provides an in-depth analysis of the European Union's newly adopted AI Act (march of 2024) and its implications for copyright compliance in the context of artificial intelligence. The AI Act represents a significant regulatory milestone, introducing a comprehensive framework aimed at governing the development and use of AI while prioritizing the protection of fundamental rights. This framework is particularly relevant to the creative industries, as it addresses concerns related to the use of generative AI, which often involves the use of copyrighted materials for training purposes. KEA (2024) highlights the significant ethical and legal concerns associated with the use of generative AI. One major issue is the unauthorized use of copyrighted materials for training AI models, which can lead to disputes over intellectual property rights. Moreover, there is a risk that the widespread production of AI-generated content could devalue original artistic works, flooding the market with content that is easily and quickly produced. Questions also arise regarding the authenticity and authorship of AI-generated creations, challenging traditional notions of artistic identity and integrity.

The AI Act addresses these concerns through several key provisions. KEA (2024) explains that one of the central aspects is the imposition of transparency requirements on providers of general-purpose AI (GPAI) systems. Recital 107 of the Act mandates that providers must publicly disclose a detailed summary of the content used to train their models, including both public and private data sources. This requirement is designed to ensure accountability and

facilitate the enforcement of copyrights, allowing rightsholders to exercise their rights effectively. The AI Act further stipulates that this summary should be presented in a standardized template, simplifying compliance for AI providers while protecting the interests of copyright holders (KEA, 2024). The Act also introduces limited exceptions for text and data mining, recognizing the need to balance copyright protection with the promotion of innovation and research. These exceptions are particularly relevant for non-commercial research activities, though the Act emphasizes that authorization from rightsholders is still necessary unless specific copyright exceptions apply. The author explains that the Act clarifies that these provisions align with the existing text and data mining exceptions outlined in Article 4 of the Copyright in the Digital Single Market (CDSM) Directive, reinforcing the applicability of these exceptions to AI model training. KEA (2024) adds that jurisdictional compliance is another critical aspect of the AI Act. Recital 106 requires that providers of general-purpose AI models adhere to Union copyright and related rights laws, regardless of where the AI model's training took place. This provision is intended to prevent providers from circumventing EU copyright standards by training models in jurisdictions with lower standards, thereby ensuring fair competition and protecting the interests of creators and rightsholders. The author defends that although the Act marks a significant step forward in regulating AI and copyright law, its full implementation will be phased in over time, with different provisions coming into effect over the next several years. This staggered timeline reflects the complexity of the regulation and the need for adequate preparation.

3.3 AI art as business in the art industry

The integration of Artificial Intelligence (AI) into the visual art industry introduces a range of potential economic impacts that fundamentally reshape how art is created, consumed, and valued. From an economic standpoint, and using research by Hou, (2023), this paradigm shift in art creation and consumption reflects several key dynamics. Hou (2023) acknowledges the rapid advancements in AI technology, particularly in generative AI, which can produce unique digital content, including visual art. This technology's increasing sophistication has sparked debates about its potential to disrupt traditional art markets. On one hand, AI art is seen as a potential threat due to its efficiency and cost-effectiveness; on the other, it is viewed as a tool that could enhance creativity when used in collaboration with human artists as previously explored throughout other chapters.

Hou (2023) traces the origins of AI in art back to pioneers like Max Bense and Harold Cohen, who explored the intersection of computer algorithms and artistic creation. The author notes the exponential growth in the popularity of AI art, with platforms like Instagram showcasing millions of AI-generated images, signalling a significant shift in public engagement with this new art form. However, traditional art forms like drawing and painting still vastly outnumber AI art in terms of online presence, reflecting the relatively recent surge in AI art's popularity.

The economic implications are another focal point explained by Hou (2023). The substantial investments flowing into AI art development, highlighted by the \$101 million funding for Stability AI and the massive \$10 billion investment by Microsoft in OpenAI, underscore the significant commercial potential seen by investors. These investments suggest that AI art is not just a passing trend but could become a significant force in the art market. The role of AI in increasing productivity within the art industry, particularly for digital artists and designers who might use AI to streamline their workflows, thus gaining a competitive edge. Despite these advancements, the author doesn't foresee AI completely replacing human artists. Instead, it argues for a more nuanced outcome where AI and human artists coexist, each bringing unique strengths to the creative process. AI's ability to handle repetitive and time-consuming tasks could free human artists to focus on more complex and emotionally resonant aspects of their work. Moreover, the potential for collaboration between AI and human artists could lead to new forms of artistic expression that neither could achieve alone. Legal and ethical concerns also play a significant role in the discussion, especially for businesses. The use of AI-generated art raises issues of intellectual property, particularly concerning the unauthorized use of existing artworks in training AI models. This has led to significant pushback from artists who feel their creative capital is being exploited without consent. The article suggests that the resolution of these legal challenges will be crucial in determining AI's future role in the art industry (Hou, 2023).

However, while AI holds promise for economic advantages in art creation and consumption, its integration isn't without complexities. Debates regarding the authenticity, quality, and human creativity in AI-generated art influence consumer perceptions and preferences. The long-term ramifications on the stability of the art market and the livelihoods of artists remain uncertain. Hence, while AI presents economic potential for the art industry, it concurrently introduces intricate challenges that necessitate ongoing evaluation and adaptation within the market landscape (Hou, 2023).

According to Shinde (2024), AI in the art market is experiencing substantial growth, with its value projected to rise from USD 3.2 billion in 2023 to an impressive USD 40.4 billion by 2033, reflecting a robust Compound Annual Growth Rate (CAGR) of 28.9%. This rapid expansion is driven by advancements in AI technologies such as machine learning, computer vision, and natural language processing, which are increasingly being used to create, critique, and curate art.

As per the author, a key driver of this growth is AI's ability to generate unique and novel artworks. AI algorithms can analyse vast datasets, identify patterns, and create original pieces that challenge traditional concepts of creativity and authorship. This capability has opened new avenues for artists, allowing them to experiment with AI as a creative tool and explore innovative forms of artistic expression. AI has also democratized access to art through virtual experiences and interactive installations. Leveraging technologies like virtual reality (VR) and augmented reality (AR), AI enables audiences to engage with art in immersive ways, transcending physical and geographical limitations. This expanded accessibility has widened the reach of art, enabling artists to exhibit their work globally and connect with audiences regardless of location.

In 2023, the cloud-based segment dominated the AI in the art market, capturing over 65% of the market share, indicating a strong preference for cloud solutions that offer scalability and flexibility. The machine learning segment was also significant, securing more than 40% of the market share, underscoring its importance in driving AI's capabilities in the art sector. Geographically, North America led the market, holding over 40% of the share with revenues of around USD 1.2 billion, reflecting the region's advanced technological infrastructure and high adoption rates of AI (Shinde, 2024).

The broader global AI market is also expanding rapidly, with projections estimating its value at USD 2,745 billion by 2032, up from USD 177 billion in 2023. This growth, at a CAGR of 36.8%, highlights the increasing integration of AI across various industries, including art. Specifically, the generative AI market, which plays a critical role in AI-generated art, is expected to grow from USD 13.5 billion in 2023 to USD 255.8 billion by 2033, at a CAGR of 34.2%, indicating a strong investment in AI technologies that create original content (Shinde, 2024).

Public engagement with AI art is notable, with 27% of Americans having viewed at least one piece of AI-generated art. However, public opinion is divided; while 31% believe AI

can produce art on par with humans, a significant 76% do not consider AI-generated works as true art, as explored in Chapter 3.1. Despite this, AI-generated art has made notable inroads into traditional art markets, with 35% of fine art auctions now including AI-created artworks. A prominent example is the sale of an AI-generated portrait, “Portrait of Edmond de Belamy,” which was expected to fetch between USD 7,000 and USD 10,000 but sold for USD 432,500 at Christie’s auction house, marking a milestone for AI in the art world (Shinde, 2024).

Artist adoption of AI tools is growing, with 29% of digital artists currently utilizing AI in their creative processes, reflecting a trend towards embracing AI as a complement to traditional techniques. AI is also being used in art conservation, where it predicts art decay with an accuracy rate of 86%, highlighting its practical benefits beyond creation. Emerging trends in the AI art market include the rise of non-fungible tokens (NFTs), which have opened new revenue streams for artists by enabling the monetization of digital art. The competitive landscape is led by platforms like Midjourney, DALL-E, and Stable Diffusion, which are driving both innovation and accessibility in AI art. Online art communities have also seen a 50% rise in discussions about AI-generated art over the past three years, indicating growing interest and debate over AI's role in creativity (Shinde, 2024).

According to McCoolle (2023), artists such as Sougwen Chung and Anna Ridler have incorporated AI into their artistic practice, and for those in the commercial art world, mainstream AI-powered productivity tools are already being harnessed. Through conversations with a cross-section of the art market, including gallerists, advisors, auction houses, and entrepreneurs, the author was able to find out how they believe AI will impact buying activity in the market. For Tina Kim Gallery, which champions international contemporary artists, AI has been a helpful research tool, particularly for texts that require translation, explaining changes in translation like the way Korean was Romanised into English changed in 1984. As it stands, however, Tina Kim Gallery does not foresee using AI for pricing considerations. For other galleries such as Addis Fine Art, AI represents an opportunity down the line but does not align with its ethos in the near term, human thought and curational work go hand in hand.

McCoolle (2023) explains that larger galleries with more resourced teams will likely find it easier to upskill internally on AI and implement it sooner. According to Dirk Boll as referenced by McCoolle (2023), deputy chairman of 20th- and 21st-century art at Christie’s

London, a key value of AI tools for auction houses is their power to mine and extract data. In the words of the deputy chairman, Christie's has been using it for almost a decade to prepare cataloguing and specialist work, work that before was only done manually.

AI technology also allows us to understand collecting behaviour, interpret market developments, and even track the activities of public figures relevant to their work. Sang Tanzer, referenced by McCoole (2023), is the founder of the German AI art market data platform Sang.art, and he believes that AI can increase access to relevant art market information, help users make sense of existing data, and aid decision-making around art acquisition. He wants to democratize and bring transparency to the art market because most art lovers do not know the reasons to buy art as an investment.

Newton and Dhole (2023) delve into the profound impact that AI-generated art might have on the art industry, drawing historical parallels to the Industrial Revolution. The authors suggest that just as the Industrial Revolution led to a shift from skilled to unskilled labour and drastically changed the role of artisans, AI-generated art might similarly disrupt the current art industry by devaluing traditional artistic skills and changing how society perceives art and artists. The authors compare the transition from a pre-industrial to an industrial society, where artisans were replaced by factory workers, to the current shift towards AI-generated art. They highlight that the Industrial Revolution not only mechanized production but also led to the devaluation of individual craftsmanship. This historical context sets the stage for discussion on AI art, which allows us to argue could lead to a similar devaluation of artists' skills in favour of faster, cheaper production methods. As formerly analysed throughout the dissertation the question of creativity and authorship are crucial for AI to thrive. With AI-generated art, the question arises not only about what constitutes art but also about who or what can be considered an artist.

For AI to be fully incorporated in the art world there are significant points like labour demand that need to be addressed. The authors note that AI art generators could significantly reduce the demand for human artists in commercial sectors like illustration, animation, and graphic design, as per analysis the segment 3.2 of the dissertation. Newton and Dhole (2023) draw a parallel with the Industrial Revolution, suggesting that just as machines replaced skilled artisans, AI could replace commercial artists, leading to job losses and a fundamental shift in the industry. There is no denying the potential benefits of AI art, particularly. AI art models could open artistic creation to a broader audience, including those who might not

have the physical or technical skills to create traditional art. This democratization could lead to a more inclusive and diverse art world, though it might also further challenge the traditional notions of artistry and creativity.

Given the information at hand, while AI art holds immense potential for transforming the art market by democratizing access and enhancing creative processes, it is not yet a fully reliable business model. The technology's integration into the art world faces several challenges, including the complexities of pricing, questions of creativity and authorship, and the risk of devaluing traditional artistic skills. Moreover, legal, and ethical concerns, particularly regarding intellectual property and market volatility, further complicate its adoption. Thus, while AI art presents exciting opportunities, its long-term impact on the stability and reliability of the art market remains uncertain, necessitating cautious and ongoing discussion.

CONCLUSION

The integration of artificial intelligence (AI) into the art world represents a transformative shift, both in how art is created and how it is perceived. AI has undeniably expanded the possibilities for artistic creation by offering new tools that challenge traditional processes, allowing for faster production, broader accessibility, and a redefinition of artistic roles. However, despite the undeniable benefits, the adoption of AI in art also presents significant philosophical, ethical, and economic questions that cannot be overlooked.

Firstly, the nature of creativity remains at the heart of the debate. While AI can generate technically proficient works, it lacks the emotional depth, intent, and unpredictability that characterize human-made art. The absence of human error, spontaneity, and personal narrative in AI-generated art places limitations on its capacity to evoke the same level of emotional engagement or convey a unique personal vision as seen through the case studies analysed in the thesis. Therefore, creativity in AI is not autonomous, but rather a collaboration between human input and machine processes—suggesting that AI's role in art is more that of a tool than an independent creator. When people think about art made with or by Artificial Intelligence, they also think that anyone can be an artist. Through in-depth reflection I think it's safe to say that not everyone was born to be an artist, the educational/institutional aspect - although a bit elitist - can't be forgotten. It's wrong to say that an art major or a business one has the same artistic proficiency when the first one probably studied the matter for years.

Additionally, the authenticity and value of AI-generated art continue to be contested. In a world where authenticity is often tied to the individuality of the artist and the context of the artwork's creation, AI-produced works at the moment still struggle to achieve the same cultural and market value as their human counterparts. The factor of artistic value is tumultuous because since we still frown upon artificial intelligence there is no guarantee that these artist works won't have the same relevance as a Monet's painting in the future. Art has only the meaning we give, if we think it's pointless or hollow it doesn't matter if it's worth millions.

The lack of a clear legal framework further complicates the recognition of authorship and intellectual property rights, with ongoing debates about whether the machine, the developer,

or the user should be credited as the "author." This unresolved issue points to a need for legislative reform as AI continues to grow in prominence within creative industries.

Economically, the rise of AI-generated art introduces both opportunities and challenges. While AI can democratize art creation and open new avenues for innovation, it also threatens the livelihoods of traditional artists, particularly in commercial sectors like design and illustration. Job displacement and the devaluation of human craftsmanship are legitimate concerns as AI continues to encroach on creative fields that have historically relied on human expertise. However, AI's potential to enhance creative processes and augment human creativity suggests that, with thoughtful integration, AI can coexist with human artists rather than replace them entirely. When talking about AI, people tend to extrapolate the matter of job displacement, artificial intelligence can indeed reduce opportunities, but it can also create new ones because there's still a need for engineers and programmers who can manage artificial intelligence, as humans still have control of the machine, and it only does what we want.

There is no denying that AI undoubtedly enhances the possibilities for artistic creation and offers new tools for artists, its widespread acceptance will depend on resolving key issues of authorship, authenticity, and ethics. The future of AI in art will not be defined solely by its technical capabilities but by how society negotiates the complex relationship between human creativity and machine-generated outputs. Ultimately, AI has the potential to become a valuable partner in the artistic process, but its success hinges on balancing innovation with the preservation of the deep human elements that make art meaningful.

Although thorough, my dissertation faced several inherent limitations typical of research in such broad areas. Despite the wide scope, it may not capture every subtlety or recent development in the integration of AI with the arts. Advances in AI and art might emerge after the research was conducted, possibly reshaping the context I have presented. Additionally, while I aimed to remain objective, personal biases or subjective interpretations could have subtly influenced some sections or viewpoints in the work. Relying on existing studies, interviews, or case studies may also limit the availability of data, particularly in exploring AI's influence on artistic perception and its societal impact. Ethical concerns, which are continuously evolving, may not have been exhaustively covered, especially given the complexities surrounding AI and art. Furthermore, there is a risk of oversimplifying or generalizing certain issues when concluding from case studies and interviews. The last

problem faced in this research was the geographic constriction of the data available, mostly from the USA or the UK, which hopefully will change in the future.

Many promising areas of study could further explore the intersection of AI and the arts. A potential area is the ethical implications of AI in art, as deeper study is needed into issues such as bias in AI, the impact on artists' livelihoods, and the potential misuse of AI-generated content. Additionally, human-AI collaboration could be explored further to understand how AI works alongside human artists to produce collaborative works, and how this synergy influences artistic practices and perceptions within the creative industry. The use of AI in art curation and criticism is another avenue worth investigating, particularly in terms of how AI could curate exhibitions or critique art, potentially reshaping objectivity, artistic taste, and the role of human curators. AI's role in cultural preservation is another important area of study, as it could be used to restore artwork, create digital replicas, and safeguard historical artefacts. In the realm of sociopolitical impact, research could examine how AI-generated art is used in social movements or propaganda, and how it shapes public discourse.

It's possible to conclude that the matter at hand is an ever evolving one, every day new articles are published with different approaches to AI, some seeing it as a possible collaborator, others as an enemy. Given all these considerations I would like to conclude through this research that art is always progressing, it's not a static object or concept, there is no rule book that constricts art to certain laws or views although we should always consider the experience of the ones that came before us. The integration of AI in artistic endeavours in my opinion won't totally democratize the access to art creation but will facilitate art creation to those with creative proclivity, which is a characteristic that not all individuals can have and should be appreciated. The future of AI art will be what we, the public, artists and critics will make of it, but it is already a reality in many fields and should be recognised and accepted.

REFERENCES

- Alperson, P. (2009). The Oxford Handbook of Aesthetics. In J. Levinson (Ed.), *Oxford Handbooks Online* (pp. 245–257). Oxford University Press.
<https://doi.org/10.1093/oxfordhb/9780199279456.001.0001>
- Amidi, A. (2024, January 31). *New Report Confirms Worst Fears: AI Will Disrupt Countless Animation Jobs Over Next 3 Years*. Cartoon Brew.
<https://www.cartoonbrew.com/artist-rights/union-study-says-generative-ai-will-disrupt-204000-jobs-three-years-237495.html>
- Andreev, A. (2023, November 9). *The Role of Artificial Intelligence in the Publishing Industry*. State of Digital Publishing.
<https://www.stateofdigitalpublishing.com/digital-platform-tools/ai-in-publishing-industry/>
- Audry, S. (2021). *Art in the age of machine learning*. The Mit Press.
- Bani, R. (2023). Impact of Artificial Intelligence Technology in Fine Art: In Reference of Printmaking . *ShodhKosh Journal of Visual and Performing Arts*, 4(2).
<https://doi.org/10.29121/shodhkosh.v4.i2.2023.553>
- Bayles, D., & Orland, T. (1985). *Art & fear: observations on the perils (and rewards) of artmaking*. Image Continuum Press ; Saint Paul, Mn.
- Bell, C. (2015). *Art*. Jefferson Publication.
- Bellaiche, L., Shahi, R., Turpin, M. H., Ragnhildstveit, A., Sprockett, S., Barr, N., Christensen, A., & Seli, P. (2023). Humans versus AI: Whether and why we prefer human-created compared to AI-created artwork. *Cognitive Research: Principles and Implications*, 8(1). <https://doi.org/10.1186/s41235-023-00499-6>
- Beuys, J., & Harlan, V. (2012). *What is Art?* CLAIRVIEW BOOKS.

- Bohn, C. (2021). Contemporary Art and Event-Based Social Theory. *Theory, Culture & Society*, 39, 51–74. <https://doi.org/10.1177/02632764211042085>
- Botella, M., & Lubart, T. (2015). Creative Processes: Art, Design and Science. *Creativity in the Twenty First Century*, 53–65. https://doi.org/10.1007/978-981-287-618-8_4
- Briskman, L. (1980). Creative product and creative process in science and art. *Inquiry*, 23(1), 83–106. <https://doi.org/10.1080/00201748008601892>
- Caldwell, M. (2023). What Is an “Author”?-Copyright Authorship of AI Art Through a Philosophical Lens. *Houston Law Review*, 61(2), 411–442.
<https://houstonlawreview.org/article/92132-what-is-an-author-copyright-authorship-of-ai-art-through-a-philosophical-lens>
- Canda, J. (2024, April 7). *Transforming the Music Industry: AI in Song Composition and Production*. Medium. <https://medium.com/@jam.canda/transforming-the-music-industry-ai-in-song-composition-and-production-1c3b2e6c24c1>
- Christie's. (2018). *Is artificial intelligence set to become art's next medium?* Christies.com; Christie's. <https://www.christies.com/en/stories/a-collaboration-between-two-artists-one-human-one-a-machine-0cd01f4e232f4279a525a446d60d4cd1>
- Csikszentmihalyi, M. (1996). *Creativity : the psychology of discovery and invention* (pp. 30–56). Harper Perennial Modern Classics.
- DeepAI. (2024). *AI Image Generator*. DeepAI. <https://deepai.org/machine-learning-model/text2img>
- Design, D. D. (2018, January 24). *The Next Rembrandt: bringing the Old Master back to life*. Medium. <https://medium.com/@DutchDigital/the-next-rembrandt-bringing-the-old-master-back-to-life-35dfb1653597>
- Dewey, J. (1934). *Art as experience*. Minton, Balch And Co., (S.D).

- Epstein, Z., Levine, S., Rand, D. G., & Rahwan, I. (2020). Who Gets Credit for AI-Generated Art? *IScience*, 23(9). <https://doi.org/10.1016/j.isci.2020.101515>
- Eurojust. (2023). *Generative Artificial Intelligence: the impact on intellectual property crimes*. <https://www.eurojust.europa.eu/sites/default/files/assets/generative-ai-impact-to-ip-crimes.pdf>
- Ferlatti, A. (2021, November 25). *Neural Style Transfer (NST) — theory and implementation*. Medium. <https://medium.com/@ferlatti.aldo/neural-style-transfer-nst-theory-and-implementation-c26728cf969d>
- Filimowicz, M. (2024, January 20). *The ethics of AI-generated art: Who gets the credit?* Higher Neurons. <https://medium.com/higher-neurons/the-ethics-of-ai-generated-art-who-gets-the-credit-b9eb6d86fde5>
- Findlay, M. (2012). *The value of art : money, power, beauty*. Prestel.
- Freeland, C. (2003). *Art Theory : A Very Short Introduction*. Oxford Oxford University Press -02-13.
<http://www.veryshortintroductions.com/view/10.1093/actrade/9780192804631.001.0001/actrade-9780192804631-chapter-5>
- Gatys, L., Ecker, A., & Bethge, M. (2016). A Neural Algorithm of Artistic Style. *Journal of Vision*, 16(12). <https://doi.org/10.1167/16.12.326>
- Ghosh, A. (2023). Artificial Intelligence as an Innovation in the Film Industry. *Research Inspiration*, 3(3), 12–16.
- Grassini, S., & Koivisto, M. (2024). Understanding how personality traits, experiences, and attitudes shape negative bias toward AI-generated artworks. *Scientific Reports*, 14(1), 4113. <https://doi.org/10.1038/s41598-024-54294-4>
- Grba, D. (2022). Deep Else: A Critical Framework for AI Art. *Digital*, 2(1), 1–32.
<https://doi.org/10.3390/digital2010001>

- Hageback, N., & Hedblom, D. (2022). *AI for arts* (pp. 50-). Crc Press, Taylor & Francis Group.
- Hans Robert Jauss. (1982). *Toward an Aesthetic of Reception*. University of Minnesota Press.
- Heinich, N. (2014). Práticas da Arte Contemporânea: Uma Abordagem Pragmática a um novo Paradigma Artístico. *Sociologia & Antropologia*, 4(2), 373–390.
<https://doi.org/10.1590/2238-38752014v424>
- Henkin, D. (2023, December 5). *Orchestrating the Future—AI in the Music Industry*. Forbes. <https://www.forbes.com/sites/davidhenkin/2023/12/05/orchestrating-the-future-ai-in-the-music-industry/>
- Holub, R. C. (1984). *Reception theory : a critical introduction*. Routledge.
- Hong, J.-W., & Curran, N. M. (2019). Artificial Intelligence, Artists, and Art: Attitudes Toward Artwork Produced by Humans vs. Artificial Intelligence. *ACM Transactions on Multimedia Computing, Communications, and Applications*, 15(2s), 1–16. <https://doi.org/10.1145/3326337>
- Horton Jr, C. B., White, M. W., & Iyengar, S. S. (2023). Bias against AI art can enhance perceptions of human creativity. *Scientific Reports*, 13(1), 19001.
<https://doi.org/10.1038/s41598-023-45202-3>
- Hou, A. (2023, November 11). *The Future of AI Art and its Potential Interactions with the Art Industry*. NHSJS. <https://nhsjs.com/2023/the-future-of-ai-art-and-its-potential-interactions-with-the-art-industry/>
- Hu, Y. (2023). Literature in the Age of Artificial Intelligence. *Advances in Social Science, Education and Humanities Research*, 1781–1787. https://doi.org/10.2991/978-2-38476-092-3_228

- IBM. (2024, May 13). *AI vs. machine learning vs. deep learning vs. neural networks* / IBM. Wwww.ibm.com. <https://www.ibm.com/think/topics/ai-vs-machine-learning-vs-deep-learning-vs-neural-networks>
- Jiang, H., Brown, L. T., Cheng, J., Khan, M., Gupta, A., Workman, D., Hanna, A., Flowers, J., & Gebru, T. (2023). AI Art and Its Impact on Artists. *AIES '23: Proceedings of the 2023 AAAI/ACM Conference on AI, Ethics, and Society*, 363–374. <https://doi.org/10.1145/3600211.3604681>
- KEA. (2024, March 14). *EU AI Act: shaping Copyright compliance in the age of AI Innovation*. KEA. <https://keanet.eu/eu-ai-act-shaping-copyright-compliance-in-the-age-of-ai-innovation/>
- Latikka, R., Bergdahl, J., Savela, N., & Oksanen, A. (2023). AI as an Artist? A Two-Wave Survey Study on Attitudes Toward Using Artificial Intelligence in Art. *Poetics*, 101, 101839–101839. <https://doi.org/10.1016/j.poetic.2023.101839>
- Li, Y. (2022). Research on the Application of Artificial Intelligence in the Film Industry. *SHS Web of Conferences*, 144, 1–6. <https://doi.org/10.1051/shsconf/202214403002>
- Lyu, Y., Wang, X., Lin, R., & Wu, J. (2022). Communication in Human–AI Co-Creation: Perceptual Analysis of Paintings Generated by Text-to-Image System. *Applied Sciences*, 12(22), 11312. <https://doi.org/10.3390/app122211312>
- Machado, P., Romero, J., & Greenfield, G. (2021). *Artificial intelligence and the arts : computational creativity, artistic behavior, and tools for creatives* (pp. 61–79). Springer.
- Madden, C. (2004). Creativity and Arts Policy. *The Journal of Arts Management, Law, and Society*, 34(2), 133–140. <https://doi.org/10.3200/jaml.34.2.133-140>
- Mangiolardo, M. M. do A. L., Almeida, P. S. de, & Vita, J. B. (2021). O retrato de Edmond Belamy e a interface entre arte e inteligência artificial: por uma nova

- definição de autoria e direitos de propriedade intelectual. *Revista de Direito Internacional*, 17(3). <https://doi.org/10.5102/rdi.v17i3.7191>
- Mántaras, R. L. de. (2017). *Artificial Intelligence and the Arts: Toward Computational Creativity*. OpenMind. <https://www.bbvaopenmind.com/en/articles/artificial-intelligence-and-the-arts-toward-computational-creativity/>
- McCooles, V. (2023, October 26). *How AI Is Changing the Art Market*. Artsy. <https://www.artsy.net/article/artsy-editorial-ai-changing-art-market>
- McKenzie, T. (2024, April 23). *A Third of Translators & a Quarter of Illustrators Lost Jobs to AI*. 80.Lv. <https://80.lv/articles/a-third-of-translators-a-quarter-of-illustrators-have-lost-their-jobs-to-ai/>
- Meyer, R. (2013). *What was contemporary art?* (pp. 1–15). The MIT Press.
- Mirisola, J. (2019). *What Is Contemporary Music? | Berklee College of Music*. Berklee.edu. <https://www.berklee.edu/news/berklee-now/what-contemporary-music>
- Moore, J., & Acharya, A. (2023, November 9). *The Future of Music: How Generative AI Is Transforming the Music Industry*. Andreessen Horowitz. <https://a16z.com/the-future-of-music-how-generative-ai-is-transforming-the-music-industry/>
- Neapolitan, R. E., & Jiang, X. (2018). *Artificial intelligence : with an introduction to machine learning* (pp. 1–10). CRC Press, Taylor & Francis Group.
- Newton, A., & Dhole, K. (2023). *Is AI Art Another Industrial Revolution in the Making?* <https://doi.org/10.48550/arxiv.2301.05133>
- Oksanen, A., Cvetkovic, A., Akin, N., Latikka, R., Bergdahl, J., Chen, Y., & Savela, N. (2023). Artificial intelligence in fine arts: A systematic review of empirical research. *Computers in Human Behavior: Artificial Humans*, 1(2). <https://doi.org/10.1016/j.chbah.2023.100004>

- Pelowski, M., Gerger, G., Chetouani, Y., Markey, P. S., & Leder, H. (2017). But Is It really Art? The Classification of Images as “Art”/“Not Art” and Correlation with Appraisal and Viewer Interpersonal Differences. *Frontiers in Psychology*, 8. <https://doi.org/10.3389/fpsyg.2017.01729>
- Pestano, D. (2024, January 24). *AI in Photography - The Good, The Bad and The Ugly*. Professional Photo. <https://professionalphoto.online/ai-artificial-intelligence/ai-in-photography-the-good-the-bad-and-the-ugly/>
- Pi, W. (2024, April 3). *An Introduction to Recurrent Neural Networks (RNNs)*. Medium. <https://medium.com/@researchgraph/an-introduction-to-recurrent-neural-networks-rnns-802fcfee3098>
- Popper, F. (1993). The Place of High-Technology Art in the Contemporary Art Scene. *Leonardo*, 26(1), 65–69. <https://doi.org/10.2307/1575783>
- Pra, M. D. (2023, October 30). *Generative Adversarial Networks*. Medium. <https://medium.com/@marcodeipra/generative-adversarial-networks-dba10e1b4424>
- Ragot, M., Martin, N., & Cojean, S. (2020). AI-generated vs. Human Artworks. A Perception Bias Towards Artificial Intelligence? *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems*. <https://doi.org/10.1145/3334480.3382892>
- Rajchman, J. (2011). O pensamento na arte contemporânea. *Novos Estudos - CEBRAP*, 91, 97–106. <https://doi.org/10.1590/s0101-33002011000300005>
- Rancière, J. (2013). *The Politics of Aesthetics*. Bloomsbury Publishing.
- Rebentisch, J. (2015). The Contemporaneity of Contemporary Art. *New German Critique*, 42(1), 223–237. <https://doi.org/10.1215/0094033x-2753672>

- Rocca, J. (2019, March 15). *Understanding Variational Autoencoders (VAEs)*. Medium.
<https://towardsdatascience.com/understanding-variational-autoencoders-vaes-f70510919f73>
- Roose, K. (2022, September 2). An A.I.-Generated Picture Won an Art Prize. Artists Aren't Happy. *The New York Times*.
<https://www.nytimes.com/2022/09/02/technology/ai-artificial-intelligence-artists.html>
- Roth, E., Swicord, R., & Fitzgerald, F. S. (2009, February 6). *The Curious Case of Benjamin Button*. IMDb. https://www.imdb.com/title/tt0421715/?ref_=tt_mv_close
- Rothenberg, A. (2019). *The Role of Error in Creativity*. Psychology Today.
<https://www.psychologytoday.com/intl/blog/creative-explorations/201902/the-role-error-in-creativity>
- Sahota, N. (2024, March 8). *The AI Takeover In Cinema: How Movie Studios Use Artificial Intelligence*. Forbes.
<https://www.forbes.com/sites/neilsahota/2024/03/08/the-ai-takeover-in-cinema-how-movie-studios-use-artificial-intelligence/>
- Sarker, I. H. (2021). Deep Learning: a Comprehensive Overview on Techniques, Taxonomy, Applications and Research Directions. *SN Computer Science*, 2(6). Springer. <https://doi.org/10.1007/s42979-021-00815-1>
- Sawyer, R. K. (2021). The Surprising Path of Creativity. *Journal of Creativity*, 31.
<https://doi.org/10.1016/j.yjoc.2021.100002>
- Scott, A. O. (2023, December 27). Literature Under the Spell of A.I. *The New York Times*.
<https://www.nytimes.com/2023/12/27/books/review/writers-artificial-intelligence-inspiration.html>

- Shaffi, S. (2023, January 23). *“It’s the opposite of art”*: why illustrators are furious about AI. The Guardian. <https://www.theguardian.com/artanddesign/2023/jan/23/its-the-opposite-of-art-why-illustrators-are-furious-about-ai>
- Shinde, Y. (2024, June 25). *AI in Art Market to be Worth USD 40.4 billion by 2033*. Market.us Scoop. <https://scoop.market.us/ai-in-art-market-news/>
- Spair, R. (2024, May 22). *The Rise of AI in Hollywood: How Technology is Changing the Movie Industry* #innovation #technology.... Medium. <https://medium.com/@rickspair/the-rise-of-ai-in-hollywood-how-technology-is-changing-the-movie-industry-innovation-technology-0677faa67886>
- Sun, P. (2024). A Study of Artificial Intelligence in the Production of Film. *SHS Web of Conferences*, 183, 03004. <https://doi.org/10.1051/shsconf/202418303004>
- Tate. (n.d.). *Authenticity – Art Term*. Tate. <https://www.tate.org.uk/art/art-terms/a/authenticity>
- The CISO Perspective. (2020). What is Machine Learning? A.I., Models, Algorithm and Learning Explained. In *YouTube*. <https://www.youtube.com/watch?v=rADYARpj-V8>
- Townsend, S. (2024, March 2). *Exploring the Impact of AI on Film Production in 2024*. Medium. <https://medium.com/@channelasaservice/exploring-the-impact-of-ai-on-film-production-in-2024-f02da745af00>
- Wollheim, R. (1980). *Art and its objects* (pp. 100–120). Cambridge University Press.
- Zylinska, J. (2020). *AI art : machine visions and warped dreams*. Open Humanities Press.

Appendix I – Interview with Constant Brinkman

Sofia: Good afternoon, just to start, would you mind if I recorded the interview?

Constant Brinkman: Good afternoon. No, I don't mind.

Sofia: When did you first notice that AI was making its way towards art, and how did you come up with the concept and idea for the gallery?

Constant Brinkman: Ok, we my colleague and I are data scientists. We are programmers. We use large databases for a long time, and also, I started to using AI to solve some big data problems. But that didn't work out really well, because computers were not fast enough. Suddenly, computers were fast enough, and there was such an amount of data that there could be that there were visuals. And at that moment, we jumped in again on this bandwagon of AI. There was a one and half year ago, I think we thought, this is something that will never leave. This is here to stay, so let's do beautiful things with this. So, we started creating artworks, which we thought was art, but it was not good enough. And then we thought, what is wrong with this? And then we discovered that, while we are not artists, we thought we need artists, and we found artists inside the large language models. So, from that day on, we have created several artists who only exist in AI, and actually I told you that we have created them, but we like to think that they created themselves because we ask open questions and they answer, and slowly They are getting a character. Slowly it becomes someone, and they tell us information about their background, about what they like and do not like, where they like to eat, if they have pets, and all kinds of stuff, silly stuff. But because they tell them these silly stories, at some point, they come together and they form personal, personality and a life, okay?

Sofia: Well, regarding authenticity and human creativity, that's a big discussion going on at the moment, the lack of human creativity. What do you think about that? If you believe that we're losing the human creativity?

Constant Brinkman: No, absolutely not. Well, the thing is, you know, everyone has copied other people. So all the painters have studied paintings. They have books about paintings, they go to museums and gallery to see what's new. They try to copy their technique. So, the whole stealing, that's not always the case. That's also there is a reason why you cannot prevent people of copying someone else's style, because you need to be able to do that to be able to improve it, to get a better result. So, it's often the case that someone invented the new

way of making a painting, and other people are copying this. So, it might as well be that Pollock, who has this dripping technique, he might have seen someone else do it in a studio, and they did a bad job at it, and then Pollock did it better. So, you need to be able to copy things to improve. And that's what AI is doing. It's copying things that are already there. Yeah, so it's the natural evolution of things. And I think it will come to a stage that AI is creative, and it will make new things, and other artists will look at it “wow, that's something new, I would like to “copy” that” and AI will not be angry with this, but that will happen, I'm sure.

Sofia: So, since you started the gallery, you and your colleague, what was the initial reaction or reception by the public?

Constant Brinkman: Not everyone, but it was, well, actually most of the people, they were not so happy. Most of the artists were not happy. But once they we told them the whole story, how we created the characters and what the characters are creating, then they thought, oh, there is real work behind this. There is an idea behind this. There is more to it than just creating a prompt and then getting an output. You know, everybody can draw, but not everybody will become Picasso. You need to have to be able to do something better with it. So, we think of AI and AI are are the same actually. There's now a huge quantity of really disgusting, well, not disgusting they're all beautiful, but it's not art. There is every day, millions of images being presented as new AI artwork, which is, of course, not good. But on the other hand, there are millions of images being taken, taken every day by everyone in the world. Everybody makes every day at least one image. So, there are 4 billion images a day. So, they're all, most of them are bad and some are good. So, you need to be able to make good quality images. That's very important to be creative. Create something new, something original. And AI is very much capable of creating something original, because AI can combine different styles of people, of artists, but it can also you can describe, for example, you can describe a smell. Can convert smell into a painting, which is quite amazing and which because for a human mind, that's very hard to do.

Sofia: Well regarding ethical problems, I don't know if you can disclose those type of things, but I would like to know if you have encountered some ethical problems regarding your exhibit.

Constant Brinkman: Can you be a little bit more precise.

Sofia: Regarding the aspects of imitation over the artists, I don't know if you have encountered that type of problem. What I mean is, if you've encountered some type of, I don't believe legal problems, but some ethical that might have made business harder?

Constant Brinkman: What do you mean by ethical?

Sofia: Do you believe some artists, for example, accused you of copying their style? So how did you move on from that?

Constant Brinkman: No one told us “You are ripping my style”. There have been artists who told us “My style is ripped, not by you, but it's ripped”. And then we'll always say, “Okay, please show me the evidence of that”, not because we don't believe it, but if we have an artwork here that is someone else's and he can prove it, or he or she can prove it, then we will recognize this. But this is never the case. It will never happen. The AI machines are so sophisticated they will use thousands of images to create a new one. You cannot go back to the source, which is, of course, good, but you also, if you read a book, if you read 10 books, and they ask you, after reading those 10 books, to write a story, you will write a story with this in the background of your head. Same with paintings, same with AI. It's not unethical.

Sofia: I don't intend in making uncomfortable questions just to be clear. It's just I must have those type of questions, because the further I'm going I have to have those perspectives regarding intellectual property.

Constant Brinkman: What's very important in this is, for example, the problem prompt, if you have a prompt, then the prompt that, if it's short prompt, then the image generation software will include, will add a lot of extras. So, if you just ask a bowl of soup, then it will add, “Okay, shall I put it on the table, or shall I put it in the middle of a forest? Kind of soup will it be?”. The image generation software will decide them. But if you tell it, I want a bowl of soup in the top of a tree with a kangaroo next to it and be given under three leaves have to be blue instead of green. Well, the longer the prompt is, the more original the artwork will become. On the other hand, if the artwork comes from a machine, a machine cannot hold copyright. Copyright is can only be claimed by a human, so not by an animal. There are, there's an elephant who is making artworks. There is monkey who did an image. He made a selfie, which is where you can find it online. This monkey doesn't hold the rights for this image, and a computer doesn't hold the right when it's created an image, the image is public domain, so all the images you see are public domain. But if you make a long prompt, then my expectations are that in the future, this will lead up to your copyright, because you are

the person who entered this prompt that was able to, and you use this as a tooling. We see AI as a tooling.

Sofia: Okay, that would be my next question. So, you're answering it already in my thesis, I believe AI can be a tool. I'm not going to end up the dissertation by saying AI is bad, because it wouldn't be right for me. I'm using AI, for example, to help me read PDF of hundreds of pages. It's helpful. So, it would be hypocrite of me to say it's not a tool.

Constant Brinkman: And it will also make mistakes. If you read hundreds of PDFs and you ask it, okay, what does those pdfs have in common, it will give you an answer which is roughly 80% correct. So, if you if you satisfied with 80%, AI would help you all the way. And AI, if you are a writer or painter or musician, AI will help you all the way. There are now there is a big discussion, because two software, two new pieces of software recently released last week for creating music. Another big discussion here in the Netherlands about student artists be afraid. The same was, was a year ago with the visual arts. Now the musicians asked same thing. I think if they use it, they will benefit from it. On the other hand, if you're a keyboard player and you want to have a new sound, you can also use AI to have this sound under every note, and then you can play your keyboard by hand as Ana, as a musician, and then the sound that you're hearing is AI. So, who, who's the ownership? Is it AI generated? Is it the musician? No, it's a combination. So it must be, it's a tool, and we like to use AI. That's our extra layer that we have in the gallery. So, the artists are also AI, which is even more weird.

Sofia: I would describe it as innovative. I don't believe it's weird. I think people are still trying to accept it, but I believe someday it would be a normal thing, yes.

Constant Brinkman: Well, I think so too. There is a small problem if you're, for example, using image generation software that is online has more and more restrictions, so it's hard to get nudity out of those. So there, there was these restrictions. Is something that is not, doesn't exist in real life. Well, it does exist, of course, in the law. But this is different. There is more to it. This is something which is weird for, if you want to create art as an artist, you want to be able to paint everything you want. If there's suddenly a combination you put on the canvas and the canvas says, "Sorry, you cannot put that on the canvas" that will be mind blowing,

Sofia: Restrictive, yeah.

Constant Brinkman: This is what happening now with AI. So, I hopefully this layer that is now put-up, put-upon AI will disappear again, just like it was one and a half year ago.

Sofia: Regarding still about ethical considerations. For example, here in Portugal, he had the case of someone using the voice of one of our most famous singers, Amália Rodrigues, and people were outraged because she passed away already. So, what do you think about that?

Constant Brinkman: Well, the thing is, there is no issue here. I mean, the current the law gives you, if you have a voice that's been copied, the voice has copyright owner. Your voice is your ownership. If someone copies your voice, you can tell "I'm sorry that's not allowed". That was already the case. There is no issue AI has nothing to do with it. People are copying this. It is illegal for the current law. Stop it. That's easy. It's easy. You cannot copy. There was a big discussion in the Netherlands. There were some politicians who got their face on some movies, they blamed AI for that. No, AI is just technique. This is not allowed by the current law. It's not allowed to do this. So, take them. Take it offline. Blame it, because that's possible to do in within the current law. So this guy in Portugal, if the people behind this voice, there's probably relatives they could blame and they could sue him.

Sofia: So, what you're saying is, AI is not the problem. The people behind AI are the problems.

Constant Brinkman: Yes, we are reusing this technique, and you can copy there are a lot of people who can change their voice into someone else and sound like completely different.

Sofia: Okay, so moving on from the ethical considerations. I don't know if you are able to disclose this type of information, but my Masters is in business, so I have to have that component in the dissertation. How would you describe the revenue and how people went for your gallery

Constant Brinkman: Actually, we have a decrease in sales. From the start, and now it's slowly, it's horizontal. We used to sell a lot more in the beginning. People are still they don't know exactly what to do with it. They're a little bit in doubt. "What am I buying?" People ask us of NFTs, we do not do NFTs. I don't believe in NFTs. NFTs I don't know what to think of it just, it's a copyright that you have on a digital image. Well, we sell the real image. So, the discussion about, what are you buying, and is AI capable of creating a real artwork, that is big discussion. But for me, that's not important. If someone is happy with the artwork, they can put it up in their home. We have a lot of first buyers coming into our gallery. They

told us, this is the first artwork I'm buying. And they send us images that is still on the wall, and they send us everything. They love it, and other people come in, well, this is an ugly piece. And I said, "Well, you're insulting my other clients. Why do you do this?" I mean, you can love Salvador Dali, but you can also hate him. It's not important.

Sofia: It's a question of aesthetic and personal opinion. So, I don't believe AI is in any way responsible for how I view artwork, and I believe that is the problem of your business at the moment, people went to your gallery with a preconceived idea, and they are incapable of enjoying the new art they are seeing because they think it's AI. It's not real art. But why is it not?

Constant Brinkman: We have been selected for a big art fair in the Netherlands. The year before, we were not accepted on the art fair, and now we were able to come. We had the busiest booth of the whole art fair for six days in a row. Everyone came to see what we were doing. Everyone wanted to know, but we didn't sell a lot of artworks because people came to talk with us, they have an opinion, but they are still little bit afraid of AI, afraid about who's the owner and what do other people think about it. which is kind of interesting that people are a little bit afraid of this, it's good I mean, the first artworks that were created thousands of years ago, even Picasso also, he painted something, and people were afraid of it.

Sofia: Van Gogh, for example, no one paid attention to his art when he was alive. So, I don't know how people didn't like it at the time, but now is the, I would say, a kind of God in the art world, for example, here in Porto we have in Alfândega do Porto the "Van Gogh's Experience", which is the paintings in video and with music in the walls of Alfândega, which is incredible to watch. Of course, it's not AI, but it was the closest of technology I could go to an exhibit, and I loved it. I'm trying to stay informed in the AI art world, because you are the first I see doing this. Your artists are and the characters that you created for the artwork. That's a total new thing. We have artists they are using AI to help them create arts, not as you are doing. So that's very innovative.

Constant Brinkman: Leonardo da Vinci would have adopted, AI, I believe so. I'm 100% convinced of that, I mean, a lot of people, they love it. That's really fun. So that's really, I think we are on the brink of acceptance, but this new art form will 100% be adopted and accepted by living artists. I know for one artist, who is using AI, he's creating an AI artwork, and then he's projecting the contours of this artwork on canvas, and then it's using brush and

oil paints to paint the canvas, and then he doesn't know what was originally there, so he's using AI for a completely different way, beautiful artworks.

Sofia: I believe this would be my last question, because we talked about other things while going in the interview, how would you measure the success of AI powered exhibits compared to the traditional we are used to?

Constant Brinkman: Early to say, to compare it. I mean, we are not a museum people see us as a museum. We're not a museum because we sell the art. I think if we could be a museum, it would be quite busy. People ask us all the time "Where can we buy a ticket" and then we said "No, it's free. We are a gallery." We would love it if you bought an artwork with us, but it's free to see, so there will be a lot of acceptance. There has been a lot of acceptance we helped with a lot of expositions around the world, they ask for our artists, and we send art to them. So, a lot of museums, they start to accept, I think within a year, every museum has something of AI. Last year, the MOMA didn't want to have anything to do with AI, and now it has Refik Anadol. Everyone has AI.

Sofia: Well, I hope your gallery becomes a museum. Thank you. Well, I think that's it for today. I think I gather the major information I wanted for the dissertation. I really appreciate your time and your vision.