



UNIVERSIDADE
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AUTHORSHIP AND APPROPRIATION
IN ARTIFICIAL INTELLIGENCE GENERATED ARTWORKS

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By

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Abstract

The rapid development of cognitive sciences in the context of Artificial Intelligence (AI) and its supersonic immersion into almost every field, including that of the arts, urges culture studies to closely review the authorship and framework of such artworks. Supported by the popular culture representations in science-fiction films and prolific media headlines that aim to capture our attention among the multitude of information available, AI slips through as an abstract idea. Data, as the sine qua non of Artificial Intelligence, require us to look into the structure of technological methods used to produce art and examine the subtle influence of the human factor behind big digital data. Attempting to escape the non-humanization of the provenance of AI, we will examine the author's intention and potential gender or racial discrimination pitfalls. Moreover, by reviewing the historical evolution of machine-made art as well as some recent examples of corporate cultural patronage initiatives, this research aims to examine the conditions that frame the existence and further development of art made with code. Overall, this dissertation aims to investigate how AI is used in art production and examine whether or not AI impacts on the authorship of an artwork, and what the nature of that impact is.

Key words: Artificial Intelligence art, computational Art, authorship in AI, appropriation, art market, algorithmic art, computer art, machine-made art, Computational creativity, data labelling

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This thesis was inspired by my personal interdisciplinary interest in both art, culture and technology. The subject selection was triggered by my involvement in the task of labelling and categorising data for a Machine Learning startup which allowed me to better understand what lies behind an AI algorithm and how the human factor lies highly undetected in the popular perception.

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List of acronyms

- Artificial Intelligence - AI
- Generative adversarial networks - GANs
- Machine Learning - ML
- Deep Learning - DL
- Science, Technology, Engineering, and Mathematics - STEM

Terminology

Machine Learning Algorithm	An algorithm in Machine Learning “is the hypothesis set that is taken at the beginning before the training starts with real-world data.”(Bhattacharjee, 2017)
Training or Learning	“While training for machine learning, you pass an algorithm with training data. The learning algorithm finds patterns in the training data such that the input parameters correspond to the target. The output of the training process is a machine learning model which you can then use to make predictions.” (Bhattacharjee, 2017)
Labels	The characterization of the item that should be predicted using Machine Learning. For instance, a picture of a cow would have the label “animal” and “cow”. Labels for data are often obtained by asking humans to make judgments about a given piece of unlabeled data (e.g., "Does this photo contain a horse or a cow?") and are significantly more expensive to obtain than the raw unlabeled data.
Labelled	Labelled data are data that have been already reviewed either by an algorithm

data	or by a human and have been tagged with what they comprise of.
Unlabeled data	Unlabeled data are samples of data, either images or videos or any other piece of information, that can be used to train a learning model.
model	In Machine Learning a model defines the relationship between features and label. In order to train an ML model, the learning algorithm needs a data set of already labeled data to learn from. The term ML model refers to the model result that is created by the training process.
Training a model	Training a model refers to the process of using different data sets of labelled examples that results in the model recognizing the relationship between labels and features
GANs	Generative Adversarial Networks are an “unsupervised” class of Machine Learning and consist of the use of two neural networks that are working “against” each other to improve their respective results. The "Generator" network attempts to generate convincing results while the "Discriminator", as its adversary, classifies convincing from less convincing images.
Inference	Is the process of using an already trained model to identify unlabeled examples

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I. Introduction

From the invention of the World Wide Web thirty years ago, to the various technological developments that have come to frame our daily lives, we have left the analog era to fully emerge in a digital modernity that has allowed us to re-imagine the way we interact with each other, machines and art. As best described by cybernetics¹ artist and art theorist Roy Ascott, the recent technological advancements are “calling into question the very nature of what it is to be human, to be creative, to think and to perceive, and indeed our relationship to each other and to the planet as a whole”(Ascott, 2007, p. 232). Algorithms evolve to continuously revamped, elaborate and mature structures, and force us to inevitably discuss subjects that were previously exclusively assigned to humans such as agency, creativity, intentionality, and artistic expression. Looking into cybernetics as the predecessor of Artificial Intelligence (AI), Ascott’s exploration of the scientific automations role as “new expressive means” (Ascott, 2007, p. 232) best introduces the subject of this research which aims to look into AI in its recent artistic applications and investigate how it comes to disrupt the cultural production paradigm and perhaps affect the role of the artist.

Coined by mathematician John McCarthy as “the science and engineering of making intelligent machines”(McCarthy, 1955, p.3), it is precisely this notion of intelligence that challenges the role of the apparatus from a purely reproductive tool to an arguably participatory one. Indeed, in the last 40 years, the field of AI research is attempting to develop an improved executorial tool modeled after the human intelligence, that can automate functions which our bodies and minds restrict us from completing in a short amount of time. What Ascott defined as “connectivism” referred to a new era period in art brought by the continuous development of creative computing which has now given birth to novel fields of study such as digital humanities or creative programming. “Art within the telematic culture is so fundamentally different from the art of the past as to constitute an entirely new field of creative endeavour”(Ascott, 2007, p.238). In that

¹ The term cybernetics was coined by mathematician Norbert Wiener in 1948 as “the scientific study of control and communication in the animal and the machine” (Wiener, 1948, p.19) and set the ground for the field of Artificial Intelligence to follow.

aspect, we will be looking into artists attempts to explore how technological tools can be applied in creative practices as well as the production of tangible or intangible culture products. As the further elaboration of algorithmic systems comes to compliment their connection to the material-hardware, our contemporary understanding of what machines do and how electronic devices serve as “an interim contrivance” (Ascott, 2007, p.336) requires us to investigate AI in its artistic applications through the lense of Culture Studies theories.

The methodology of this dissertation will be the thorough reading and understanding of a theoretical framework tackling concepts (in its relations with Arts and Culture) such as artificial intelligence, agency, contemporary art, popular culture and new media along with the critical analysis of case studies. Culture studies will frame this research but theories of other disciplinary discourses such as visual studies, contemporary art, computer science and cognitive studies will also be relevant to answer the research questions. Thus, this research is divided into two parts. The first serves as the theoretical context for the ideas and theories surrounding the subject of AI artifacts and the identification of the author while the second presents the critical analysis of case studies that will allow us to examine some concrete examples to support the theoretical framework analysed in Part I.

Starting with the presentation of a theoretical culture studies framework for the overall study, we will be looking into relevant theories for the visual analysis of AI artworks as well as their existence within a cyber contemporary environment. Drawing its intelligence from converting and reproducing large amounts of data and in the case of visual arts, pre-existing images as references, we need to look closely at the output and identify either a novel medium of production or a reproduction. The concept of software as a set of instructions and data with no fixed shape in a continuously changing artificial environment allows us to draw comparisons with the previously identified by Zygmunt Bauman “liquidity” of modernity theory (cf. Bauman, 2000). With modern conditions imposing a continuously “changing relationship between space and time” (Bauman, 2000, p.8), both concepts become further abstract and immune in the AI era. Perfectly demonstrating this modern uninterrupted and abstract nature of space and time, and

further forcing the redefinition of previously established narratives, AI as an art production medium requires a closer study.

“The remoteness and unreachability of systemic structure, coupled with the unstructured, fluid state of the immediate setting of life-politics, change that condition in a radical way and call for a rethinking of old concepts that used to frame its narratives”² (Bauman, 2000, p.8).

As we look into this remoteness of AI through the theory of Bauman, we should inevitably pursue a further understanding of the subject of authorship in artworks created by its means. How can the continuous evolution of old concepts in the new order of things run by unreachable structures as discussed by the philosopher, potentially alter the function of the creator this emerging art field?

In order to review the concept of visual aesthetics of AI artworks, we will briefly examine the ideas of image signifiers as developed by Roland Barthes in his essay *Rhetoric of the Image* (1964) attempting to establish a link among the visual and the meaning. Accordingly, as the acceptance of an artificial author hinders risks that rely to the overall data function that fuels machine learning, we will be also looking at Barthes semiotics analysis to review the data that train AI as the signifier and the intentions and prejudices of its creators as the signified. To compliment Barthes rhetorics of the image, we will also look into *The Visual Culture Reader* (1998) by Nicholas Mirzoeff among others, to best review the evolution of visual aesthetics in digital culture.

Moreover, to clarify the subject of authorship in an age of mechanical automation, chapter two will allow us to firstly look into the structure of AI as well as the current state-of-the-art to best identify the potential agency contributors. Looking into some of the current AI techniques used to produce art, this chapter will briefly present some examples of the technology applied with a creative objective before further looking into theories as to who is the author in AI and what is their role and responsibility in art production. To clarify why the creator's identity raises some

² Bauman, Zygmund. *Liquid Modernity*. Cambridge: Polity Press, 2000.p.8

interesting questions when it comes to Artificial Intelligence, we need to look into the different applications of the technology to properly identify the different methods that significantly impact our question regarding authorship but also the different disciplines that are rapidly involved in art creation. How do they differ from pre-established art production methods and how much do “self-learning” algorithms rely on explicit programming and data from their makers?

Starting from the Culture Studies theory and expanding towards sociology and cognitive science, we will be looking into the implicit prejudice factors that impact the data curation process and how the chain of data can significantly impact the provenance of a digitally-made paintings. To a further extent, this research will attempt to rebut the line of reasoning that presents Artificial Intelligence as a self-aggrandizing mephistophelian non-human force. Thus, investigate the overall role of the artist and the authorship responsibility that lies behind the selection and classification of data as well as the unconscious prejudice the creator brings into the process. To do so, we will leverage the Judith Butler’s critical theories along with contemporary AI artist Hito Steyerl works.

As we will further examine in chapter two as well as through the case study analysis, aside from individuals, corporate institutions also participate in the further development and promotion of AI art. Therefore, we will inspect the corporate patronage in computational art in order to identify objectives as well as consequences of those efforts. By leveraging technology advancements to promote the arts and culture through their proper platforms but also residing more and more to cultural diplomacy, it becomes evident that their access to globalised tools and resources can further accelerate and facilitate cultural diffusion but are also critical for the clear identification of a maker.

With the overall intention to identify the creator’s responsibility and role in the context of art made with code, we will be using as a starting point deeply influential authorship discourses from Culture Studies key-thinkers, and examine how they can be applicable to the contemporary artificial authorship claims. Starting with the anti-essentialist authorship theories by literary

critics, Roland Barthes (cf. Barthes, 1967) and Michel Foucault (cf. Foucault, 1969), this research will be examining the nature of the author and her or his role in the overall appreciation of the final work. As we will be discussing art and not simply literary products, the concept of authorship will be examined as the identification of the originator of an artistic concept which results in the production of an artwork, using the terms author and artist interchangeably to signify the same thing.

What the theory of the *Death of the Author* (1967) Barthes can contribute to the analysis of artworks made by AI is perhaps how to examine the works not through an artist-focused lense but to allow for the final art product to “speak” through their unique presence now.

We know now that a text is not a line of words releasing a single 'theological' meaning (the 'message' of the Author God) but a multi-dimensional space in which a variety of writings, none of them original, blend and clash. The text is a tissue of quotations drawn from the innumerable centres of culture.³ (Barthes, 1972, p. 146)

With the identification of an author remaining our focal point, we will be looking into Michel Foucault’s reprise of the subject of authorship through his work *What is an author?* and instead study how the different “author functions” (Foucault, 1998. p. 211) can best be applied to artworks generated through a machine to assist in the identification of a certain author.

Foucault’s analysis, will allow us to have a better understanding of the different functions that an author could act on depending on the cultural context of his work. In the case of machine made art, unlike scientific texts or folklore storytelling, the “discursive formation” (Foucault, 1998, p.41-42) of the works comprises also the institutional frame that creates them as well as the multiple cultural influences of the team that designs the machine.

Eventually, these theories will support the research of identifying a certain author or collective of authors, as it is critical to the further understanding of the human factor behind machine made

³Barthes, Roland. *Mythologies*. 1957 New York: Noonday Press, 1972. p. 146

art. One of the greater risks that the contemporary dialogue around AI art entails is the establishment of a concept of “artificial authorship”, which means that we completely disregard the creator behind the works and examine the artworks solely based on their audience’s interpretation risking to also disregard the different intentions and perhaps systemic influences that lurk behind its making.

Intending to further investigate this dispersion of authorship in an artistic context, chapter three will be looking at the concept of computational creativity throughout contemporary art history and attempt to identify what could the skills pallet of a potentially clearly identified author be. Where among the autonomous nature of AI lies the data role, what Ascott defined as Gesamtdatenwerk?

Out of this technological complexity, we can sense the emergence of a synthesis of the arts. The question of content must therefore be addressed to the Gesamtdatenwerk—the integrated data work—and to its capacity to engage the intellect, emotions, and sensibility of the observer.⁴ (Ascott, 2007, p.233)

Closely adjacent in the structure of the technology of AI, this part will look into the algorithms requirement of previously existing visual references to reproduce and redesign something new. Hence, we need to be looking into Culture Studies narratives that aim to identify the influence of technological reproduction on the artworks existence as well as appropriation discourses. Earlier in the 20th century, Walter Benjamin examined the effect of the technological reproducibility on the work of art as a process which transforms the copy into a chameleon that can no longer be distinguished from its original in his essay *The Work of Art in the Age of Mechanical Reproduction* (1936). As such, he explained that the concept of an artwork’s authenticity as the “essence” which lies in the “historical testimony” of the object is also compromised through its reproduction. “And what is really jeopardized when the historical testimony is affected is the authority of the object.” (Benjamin, 1936, p. 4).

⁴ Ascott, Roy. *Telematic Embrace: Visionary Theories of Art, Technology, and Consciousness*. Edited by Edward A. Shanken. Berkeley, CA: University of California Press, 2007.

Furthermore, throughout this part we will identify initiatives of different nature in regards to “creative” AI, that are attempting either to experiment with the medium’s potential or reproduce and exceed in mastery the human mind. As we will be reviewing some of these cases, the objective is to leverage established authorship and culture theories in order to identify not only who is the author-artist of these works but also how can the serial appropriation of previously-made art produce unique artworks. In addition, we will be looking into already established contemporary and historical artworks that in their time, revolutionised the art production in an attempt to identify common patterns among history and present.

In that aspect, it would be crucial to review what is the purpose of the potential automation of the artist and more importantly how will her disappearance impact our appreciation of art, alter our aesthetic criteria and perhaps endanger our critical thinking. To better identify the traces of human influence in code made art, we would need to appraise the cases of AI appropriating human made art. Apart from the established role of appropriation during the movements of dadaism and pop art, we will need to also closely review its role as the basis for the “inspiration” of the machine. In particular the use of appropriation as a learning method for Machine Learning algorithms in order for an output to be produced. In that view, it would be crucial to see what is the impact of the selection of a database comprised of artworks made by real artists to a machine generated artwork. For instance, assuming that an algorithm is only provided with abstract paintings, what are the conditions under which the final artwork will not resemble those that were provided for its training?

In the second part of chapter three we will examine the engineer-artist role and how it has evolved in the last fifty years. Since we will be reviewing elaborate Machine Learning artworks we need to further consider whether this art medium is only accessible by the very few who can master code and how the lack of sufficient skills in that domain can greatly impact the final result. As the nature and structure of mediums evolve, creative computing and consequently programming skills could potentially constitute a new canvas in the hands of artists. As such,

except for disrupting the traditional tools, what Artificial Intelligence is further altering is perhaps our stereotypical notion of who is an artist by asking questions like can a scientist or programmer make art? And is coding perhaps a skill that needs to be further democratised? Is the artworks value depending on the creator's mastery of the tools or its impact?

By drawing parallels between Jasia Reichardt's Cybernetic Serendipity (1968) exhibition, Jack Burnham's research and Joseph Beuys "Social Sculpture" theory (Tisdall, 1974, p.48.) Eventually, as the overall purpose of this research is to identify who is the author of machine made art and how can Artificial Intelligence impact the timeless standard of the artist's role in it, the subject of authorship could arguably cloud our appreciation for the artworks produced using this method. How can we consider something as art if it were not produced by an artist? To assist in this type of discourse, we would be looking into Joseph Beuys and his theory of Social Sculpture (1973) as the view that everyone is an artist and anything can be perceived as art:

Creativity is not limited to people practising one of the traditional forms of art, and even in the case of artists, creativity is not confined to the exercise of their art. Each one of us has a creative potential, which is hidden by competitiveness and success-aggression. To recognize, explore and develop this potential is the task of the School. Creation – whether it be a painting, sculpture, symphony or novel – involves not merely talent, intuition, powers of imagination and application, but also the ability to shape material that could be expanded to other socially relevant spheres.⁵ (Beuys and Böll, 1972, as cited by Tisdall, 1979 p.278)

Part II of this thesis will critically examine two case studies that were chosen based not solely on the medium used for their production but mainly due to their popular representation through mass media. The cases of "The Next Rembrandt" (2016) discussed in chapter four and the "Belamy family portraits" (2018) presented in chapter five, will both allow for a thorough examination of cultural initiatives that utilise AI in an artistic context. Looking into the corporate or systemic stakeholders involved we will attempt to understand not only the function of AI as a

⁵ Beuys, Joseph, and Böll, Heinrich, as cited in *Joseph Beuys*, Caroline Tisdall, Solomon R. Guggenheim Museum, New York 1979. p. 278

corporate cultural diplomacy strategy but also the role of the Arts Market in the further establishment of AI artworks.

In light of recent popularised reports of Artificial Intelligence made artworks sold for extravagant prices, this research will further attempt to investigate cases where machines are presented as artists and also review, not only the intents and tools used by the individuals and corporates involved in such projects, but also the potential impact of misleading authorship accounts in the Arts market. With a total estimated value of \$63.7 billion in 2018 (Art Basel, n.d)⁶, the arts market is the first to react on the Artificial authorship niche and urges us to review how certain AI initiatives can jeopardize or undermine the artists role in the continuous quest for “collectable” artworks and innovation. These cases as they will be reviewed, raise valuable concerns on how the further automation of both the art production means and the artist can further intensify the commodification of art.

Overall, the subjects and questions raised here make interdisciplinary research between humanities and Cognitive Science practices a critical asset in order to address the rabid cultural dissemination as well as the impact of data provenance in the final authorship of an artwork made with the use of AI.

Finally, all the above will allow to hopefully answer the critical questions of this research and reach some final conclusions based on the case studies presented and the theoretical framework of the research. These answers aim at providing the reader with the necessary tools in order to not only reflect on Artificial Intelligence as the new medium for art production and reproduction but also review the machine-made artworks as if the authorship was not in question based on a personal art evaluation or interpretation that could relate to emotion, originality, technique, medium or concept.

⁶ Cases where online and multimedia sources/articles are referenced have no page number.

Part I

1. AI Art in the context of Culture Studies

While discussing an interdisciplinary topic which requires the theoretical support from computer science, sociology, psychology and philosophy, the core of this research deals with subjects that should be primarily framed through key theories of Culture Studies.

One of the common threads among the subject of this thesis and the field, is the evaluation of AI as a technological tool which is utilised in an expressive form in contemporary culture and art. The topic of art produced with advanced technology can not be approached should we not primarily review it through Walter Benjamin's analysis of the conceptual loss of an artworks "aura" through its mechanical reproduction (Benjamin, 1936, p. 7).

In principle, a work of art has always been reproducible. Man-made artefacts could always be imitated by men. Replicas were made by pupils in the practice of their craft, by masters for diffusing their works, and, finally, by third parties in the pursuit of gain. Mechanical reproduction of a work of art, however, represents something new. Historically, it advanced intermittently and in leaps at long intervals, but with accelerated intensity.⁷ (Benjamin, 1936. p.3)

Using as reference his 1936 essay *The Work of Art in the Age of Mechanical Reproduction* which examines the impact of mechanical reproduction on the originality of art, we will be looking at how Artificial Intelligence has pushed reproduction a bit further than photography as it allows for the complete replication not only of the works of art but also the substitution of the artist's unique technique and role. Based on Benjamin's original arguments we will investigate where is the AI made artworks "aura" if the machine as artist can produce unlimited new products in the press of a button. The term aura is defined by the theorist as the unique presence of an artwork in space and time. What was then lost due to mass production might be now completely redefined due to artificial production and reproduction. In both cases there is a significant risk that art

⁷ Benjamin, Walter. "The Work of Art in the Age of Mechanical Reproduction." Walter Benjamin. Part I

products will be stripped from their traditional human authorship, which remains our focal point throughout the analysis. Benjamin's analysis, serves as a departing idea to further review what is the algorithmic function in the production or reproduction of art in a modern context.

During long periods of history, the mode of human sense perception changes with humanity's entire mode of existence. The manner in which human sense perception is organized, the medium in which it is accomplished, is determined not only by nature but by historical circumstances as well.⁸ (Benjamin, 1936, p. 7)

Looking into the modern historical circumstances of the information age we live in, it is undeniable that the conditions created through AI, highly complicate the unique existence of the artwork in a specific place at a particular time. Thus, what Benjamin defined as the artworks aura in our time and with contemporary tools, becomes further abstract as they are constantly changing.

As reproduction in AI is seamlessly masked under a complex technical process which constantly reproduces an unprecedented amount of mini portions of visual references, the unique existence of the artwork in a certain place or time becomes an abstract concept which could not be reviewed without sociologist Zygmunt Bauman "liquidity" theory. As first presented in his essay *Liquid Modernity* (2000) discussing the secular nature of our postmodern times, Bauman argues that the ceaseless change allows us to parallel it with the lightness and flow of liquids. "These are reasons to consider 'fluidity' or 'liquidity' as fitting metaphors when we wish to grasp the nature of the present, in many ways novel, phase in the history of modernity." (Bauman, 2000. p.3)

The extraordinary mobility of fluids is what associates them with the idea of 'lightness' There are liquids which, cubic inch for cubic inch, are heavier than many solids, but we are inclined nonetheless to visualize them all as lighter, less 'weighty' than everything solid. We associate 'lightness' or 'weightlessness' with mobility and inconstancy: we know from practice that the lighter we travel the easier and faster we move.⁹ (Bauman, 2000. p.2)

⁸ Benjamin, Walter. "The Work of Art in the Age of Mechanical Reproduction." Walter Benjamin. Part III,

⁹ Bauman, Zygmund. *Liquid Modernity*. Cambridge: Polity Press, 2000. p.2

This lightness of the modern era allows for a somewhat perfect fit metaphor with the nature of software and artificial culture. For both, speed becomes often the absolute prerequisite to signify technological excellence.

The very idea of speed (even more conspicuously, that of acceleration), when referring to the relationship between time and space, assumes its variability, and it would hardly have any meaning at all were not that relation truly changeable, were it an attribute of inhuman and pre-human reality rather than a matter of human inventiveness and resolve [...] Once the distance passed in a unit of time came to be dependent on technology, on artificial means of transportation, all extant, inherited limits to the speed of movement could be in principle transgressed.¹⁰ (Bauman, 2000. p.9)

Thus, the concepts of time and space - as the two critical aspects of the unique existence and originality of an artwork per Benjamin - further liquify through the impact of artificial means of production. While Bauman refers to instantaneity and liquidity of the modern conditions to tackle a series of contemporary subjects, this concept applied to the subject of artificially produced artworks allows us to also review the AI data content and processing speed under the continuously changeable light of the liquidity in algorithms functions.

Ascott amplifies Bauman's ideas by further introducing the concept of an abstract distributed authorship which no longer belongs to a single individual. "The emerging new order of art is that of interactivity, of 'dispersed authorship'¹¹. The canon is one of contingency and uncertainty." (Ascott, 2007. p. 237) Both Bauman's and Ascott's views serve as a prelude to the study of AI's use in the production of contemporary art and the identification of a clear authorship other than that of the automated machine.

¹⁰ Bauman, Zygmund. *Liquid Modernity*. Cambridge: Polity Press, 2000.. p.9

¹¹ First defined by Roy Ascott in his essay "Art and Telematics: Towards a Network Consciousness", in *Art Telecommunications*, ed Heidi Grundmann. Vancouver: Western Front, 1984.

In order to look into AI algorithms as systems which require a significant amount of data for them to reach an advanced literacy, we need to examine the images produced through AI as ‘visual texts’ and examine how the implicit culture references of the individual curating them can eventually impact the final visual result. Indeed, semiotics is directly related to the function of data and their respective categorisation and to appropriately examine their function within AI we can reside in Barthes semiotics analysis as well as his *Rhetoric of the Image* (1964).

As analysed in his book *Mythologies* (1957), Barthes argues that pictures can also carry “speech” and this could not be more literally applicable to any artwork other than those made with AI as the algorithm is “trained” in large pools of data (images, videos etc.) which are all labeled with particular words to signify their content.

[...] pictures, to be sure, are more imperative than writing, they impose meaning at one stroke, without analysing or diluting it. But this is no longer a constitutive difference. Pictures become a kind of writing as soon as they are meaningful: like writing, they call for a lexis. We shall therefore take language, discourse, speech, etc., to mean any significant unit or synthesis, whether verbal or visual: a photograph will be a kind of speech for us in the same way as a newspaper article; even objects will become speech, if they mean something.¹² (Barthes, 1972, p. 108-109)

In the case of AI as an artistic tool, data become the source of the reproduction. As a domino effect of the technological advancements, the equally “fluid” concept of data was brought by the rapid dematerialisation of our most personal artefacts. Guy Debord described in his manifesto *Society of the Spectacle* (1967), that as our means of production further evolve “in societies where modern conditions of production prevail, all of life presents itself as an immense accumulation of spectacles. Everything that was directly lived has moved away into a representation” (Debord, 1967. p.1). These representations of our lives, pictures, data, conversations and transactions serve as the source for AI systems to further develop their capacities and understanding. But how is this information categorised and then labeled for them to act as visual references in the AIs learning process?

¹²Barthes, Roland. *Mythologies*. p. 108-109

To appropriately understand the impact of individual perception on semiotics we need to look into Barthes visual analysis of an advertisement in 1964. Barthes explored the visual signs and attempted to examine the relation between the connotation and denotation when looking into the signified.

Thus we are here dealing with a normal system whose signs are drawn from a cultural code (even if the linking together of the elements of the sign appears more or less analogical). What gives this system its originality is that the number of readings of the same lexical unit or lexia (of the same image) varies according to individuals.¹³ (Barthes, 1964. p.46)

Inevitably, should we look into the semiotics of data tagging and categorisation for the technical process of AI to be complete, we come across a series of issues that can be linked to individual prejudices and perceptions which are then immortalised through their subtle function within databases that are shared and repetitively used by anyone wishing to “train” a machine learning model. Barthes further continues that “The variation in readings is not, however, anarchic; it depends on the different kinds of knowledge-practical, national, cultural, aesthetic-invested in the image and these can be classified, brought into a typology.” (Barthes, 1964. p.46)

Therefore, in the context of art production and as we will be closely looking further in this research, to appropriately study the individual’s influence on the data labelling, we will need to consider the risk that this entails particularly in relation to questions of both gender and racial diversity. Drawing from the works of Judith Butler’s analysis of gender and language functions within systems of power (Butler, 2006. p.3) we can identify a crucial liaison among the database hidden stereotypes concerning gendered classification of subjects which inevitably goes unnoticed under the artificial shadow of a missing author.

This becomes politically problematic if that system can be shown to produce gendered subjects along a differential axis of domination or to produce subjects who are presumed to be masculine.

¹³ Barthes, Roland, and Stephen Heath. *Image, Music, Text*. 1977 “The Rhetorics of the Image” (1964) Fontana Press, Harper-Collins Publishers, 2010 p. 46

In such cases, an uncritical appeal to such a system for the emancipation of “women” will be clearly self-defeating ¹⁴(Butler, 2006. p.3)

In a similar tone, Donna Haraway’s *Cyborg manifesto* (1985) allows this research to further frame the gender issue in relation to AI which can be identified among language and database structures in feedback-controlled systems.

[...]the translation of the world into a problem in coding can be illustrated by looking at cybernetic (feedback-controlled) systems theories applied to telephone technology, computer design, weapons deployment, or database construction and maintenance. In each case, solution to the key questions rests on a theory of language and control; the key operation is determining the rates, directions, and probabilities of flow of a quantity called information. The world is subdivided by boundaries differentially permeable to information. Information is just that kind of quantifiable element (unit, basis of unity) that allows universal translation, and so unhindered instrumental power (called effective communication).¹⁵ (Haraway, 2016. p.34)

Looking into the feminist theories of culture studies, should support a critical examination of the liaison among language and algorithms. “Without an agent, it is argued, there can be no agency and hence no potential to initiate a transformation of relations of domination within society” (Butler, 2006. p.34). It is perhaps the rapid dematerialisation and immense amount of data required for AI to properly function which allows the agency to escape closer scrutiny. As Roy Ascott explained “data is everywhere and nowhere” (Ascott, 2007 p.224). Liquid data and unidentified authors bring us to the critical question which this dissertation attempts to examine which is, who is the author in AI artifacts?

To investigate this question we need to primarily look into Barthes authorship discourse as presented in the *Death of the Author* (1967). In particular, it might seem that his analysis on the need to disregard the authors identity when looking at a cultural product seems almost a

¹⁴ Butler, Judith. *Gender Trouble - Feminism and the Subversion of Identity* Routledge, 2006. p. 34

¹⁵ Haraway, Donna J. *A Cyborg Manifesto*. Manifestly Haraway, University of Minnesota Press, 2016. ProQuest Ebook Central, p. 34

prediction that has partly come true in the concept of AI. Should we indeed approach the AI artist provenance as presented through popular culture (as will be reviewed in Part II case studies) there seems to be a certain disregard of the “who” over the “what”. The AI textual power which comes in the form of data has become “a multi-dimensional space in which a variety of writings, none of them original, blend and clash” (Barthes, 1972 p.146). From a digital culture which fully supports anonymity and the reimagining of the identity to an artificial entity, should we wish to elaborate on these subjects Barthes allows us to draw another reference to artificial identity as a myth “What is characteristic of myth? To transform a meaning into form.” (Barthes, 1957. p.131).

Linguistically, the author is never more than the instance writing, just as I is nothing other than the instance saying I: language knows a 'subject', not a 'person', and this subject, empty outside of the very enunciation which defines it, suffices to make language 'hold together', suffices, that is to say, to exhaust it.¹⁶ (Barthes, 2010, p.145)

Thus, the linguistic parallel among Barthes discourse and the modern anonymous data compilations used for the artificial systems used to produce art among other cultural products should support the examination of the authorship question. Reviewing AI through the lense of the authorship investigation in culture studies needs to look into Michel Foucault’s analysis in *What is an Author?* (1969). Instead of disregarding the author in favour of the content, Foucault suggested that we use the authorship as a source of further meaning. Attempting to look into the different author functions, Foucault’s analysis will allow us to look into artificial intelligence artworks that claim to have no author under a different light and therefore is critical for the overall subject review.

The author's name serves to characterize a certain mode of being of discourse: the fact that the discourse has an author's name, that one can say "this was written by so-and-so" or "so-and-so is its author," shows that this discourse is not ordinary everyday speech that merely comes and goes, not something that is immediately consumable. On the contrary, it is a speech that must be

¹⁶ Barthes, Roland, & Heath, Stephen. *Image, Music, Text. The Death of the Author*, 1977 Fontana Press, Harper Collins Publishers, 2010.

received in a certain mode and that, in a given culture, must receive a certain status.¹⁷ (Foucault, 1998, p. 211)

Foucault's analysis further allows us to review artworks and AI culture products through the literary authorship theories, as he clarifies that the identification of author functions can expand further than the mere text: "Finally, the author is a particular source of expression who, in more or less finished forms, is manifested equally well, and with similar validity, in a text, in letters, fragments, drafts, and so forth." (Foucault, 1998. p. 215)

Further than cultural diplomacy what these corporate patronage initiatives also entail is the reinforcement of a tendency to push the arts development towards a focus on further automation. As the purpose of the artwork is to demonstrate the capacity of the technology and not necessarily criticize or reflect on its rapid development or other social issues, the control institutions which are also the lead developers of the technology can, arguably, directly influence the future culture products to best suit their expansion goals that serve the system instead of the individual.

With the objective to examine how popular culture is controlled and diffused and what is the impact of the technological reproduction of the works of art we will be residing in the theories that discuss culture in modern society as discussed by Frankfurt School theorists Walter Benjamin, Theodor Adorno and Max Horkheimer. Their essay *The Culture Industry: Enlightenment as Mass Deception* (1944) will provide the initial argumentation on the discourse related to the connection between technology corporations, as power structures synonymous to innovation and power over the further global technological developments. In order to explore the contemporary tech corporation's role in the further development of computer art we need to also examine the extensive sponsorship and promotion initiatives in that direction. "No mention is made of the fact that the basis on which technology acquires power over society is the power of those whose economic hold over society is greatest" (Adorno & Horkheimer, 1993, p.7). Indeed,

¹⁷ Foucault, Michel. Faubion, James. *Aesthetics, Method, and Epistemology*. "What is an Author?" (1969) New York: New Press, 1998. p.211

to identify a maker in AI art we will need to study the producers of the medium as a factor with a potentially significant influence over the final product.

Moreover, to better understand the evolution of the relation among culture and technology in the established globalised environment, we can leverage George Yúdice's key-theorization as presented in *The Expediency of Culture* (2003). He explains that "globalization has accelerated the transformation of everything into resource" (Yúdice, 2003. p.28) which allows us to draw a parallel with international tech companies like Google or Microsoft more and more sponsoring computer art and partnering with cultural institutions as we will further be seeing in the example of "The Next Rembrandt"(2016) case study.

Today it is nearly impossible to find public statements that do not recruit instrumentalized art and culture, whether to better social conditions, as in the creation of multicultural tolerance and civic participation, through UNESCO-like advocacy for cultural citizenship and cultural rights, or to spur economic growth through urban cultural development projects and concomitant proliferation of museums for cultural tourism, epitomized by the increasing number of Guggenheim franchises.

¹⁸ (Yúdice, 2003. p.10-11)

Eventually, culture discourses will allow us to look into the new profile of artists working with code in a digital and globalised world. As artworks created through AI methods of production, inevitably go further than mere reproductions and instead rely on the machine speed, data and algorithmic structure to produce visual results the makers's role is also evolving. French curator Nicolas Bourriaud best described the interactive nature of the image made through a program by clarifying its continuously changing nature: "The contemporary image is typified precisely by its generative power; it is no longer a trace (retroactive), but a program (active)"(Bourriaud, 1998, p. 32). Bourriaud further discussed the contemporary art products as art of post-production which is framed within modern global culture. "Artists today program forms more than they compose

¹⁸ Yúdice, George. *The Expediency of Culture: Uses of Culture in the Global Era*. Durham: Duke University Press, 2005.

them: rather than transfigure a raw element (blank canvas, clay, etc.), they remix available forms and make use of data.” (Bourriaud, 2002, p. 16).

Eventually, all the previously discussed culture theories will serve as valuable compass through the overall examination of the subject of artificial intelligence and should support the objective for the identification of a clear authorship in AI art but also allow us to critically review the overall analysis of the contemporary computer art field.

2. Tangible or Artificial ? Who is the author in Artificial Intelligence Art

2.1 The intelligence in Artificial Intelligence - Semiotics of labelled data

Artificial Intelligence (AI) has become a popular buzzword to be used as synonymous to innovation, disruption and in some cases creativity for the arts industry among others. Before attempting to analyze the role of the Author in Artificial Intelligence artworks, defining the technology is crucial, not only for the different elements of each method used for production to be precise but also to better apprehend the different factors that require an author's touch, for the final result to be functional.

Artificial intelligence (AI) is the simulation of human intelligence processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions) and self-correction.¹⁹ (Rouse, 2018)

Although broad, this could be a simpler definition of what the term Artificial Intelligence stands for and what it aspires to be. It should be clear that to the best of the knowledge of this paper based on online and offline resources, artificial intelligence at its literal meaning is not yet accomplished although we use the term to signify the potential and aspirations of the Computer Science field. Also, there is an alternative term that has recently surfaced that recommends the use of the words "augmented intelligence" to indicate human collaboration instead of machine automation. "Augmented intelligence is an alternative conceptualisation of artificial intelligence that focuses on AI's assistive role in advancing human capabilities. Augmented intelligence reflects the ongoing impact of AI in amplifying human innovation." (Araya, 2019).

Nonetheless, although Artificial Intelligence does not exist in its literal meaning, the scientific fields that intersect in its development (including information engineering, computer science, mathematics or psychology), have allowed for different methods to surface that could potentially significantly impact the creative tools and allow for AI augmented works of Art to further

¹⁹ Margaret Rouse, "What Is AI (Artificial Intelligence)?" SearchEnterpriseAI, August 2018, 53, Accessed March 13, 2019

evolve. This research will not be focusing on a technical definition or elaboration on the methods used to produce works of art with semi-automated algorithms, but instead, it will be looking into references that can clarify the technology and examine the methods through the theoretical framework of culture studies instead.

As we will further discuss, Artificial Intelligence is largely misrepresented and misunderstood by the widespread population, partly due to popular culture representations in science-fiction movies like “Ex-Machina” or “The Terminator” and partly due to the lack of a sufficient understanding of computer programming and advanced mathematics state of the art by most of us. “The fearful quality about technology is that it is; it moves almost as if men were not its instigators; a self-propelled force, it evolves oblivious of the ambitions and contentments of the human race.” (Burnham, 1968, p.12) As art critic and theorist Jack Burnham explains we tend to view technological advancements as something independent to our own intentions although it is in fact initiated by people among us. Adorno and Horkheimer identified back in 1944 that there is indeed a significant relationship among technology and mass cultural production as the one is interrelated to the other. So, as “the system of the culture industry comes from the more liberal industrial nations” (Adorno and Horkheimer, 1993, p.7), westernised spectators eventually consume what they define as the “light” culture - produced by the same superpowers that produce technology - which prevails all others. In fact, only 0,14%²⁰ of the world’s population has an adequate understanding and appropriate skills to perceive the state of the art of current AI technology and its overall structure. Out of that minimum percentage, even fewer engage in the further development of the technology while the field is notoriously lacking both racial and gender diversity. In a Reuters story discussing how Amazon had to recall “a hiring tool that used artificial intelligence because it favored men”, the journalist further reports:

Top U.S. tech companies have yet to close the gender gap in hiring, a disparity most pronounced

²⁰ The communications of the ACM online journal, reported in 2014 that the world counts 11 Million professional developers worldwide while “the total number of software developers in the world is about 18.5 million, and about 7.5 million are hobbyists, according to IDC's 2014 Worldwide Software Developer and ICT-Skilled Worker Estimates.”(Application Development Trends, 2014). With a modern count of the world population in 2018 at 7,6 billion people, according to the demographics presented at wikipedia, the percentage of people with a basic AI understanding can be calculated at 0,14%.

among technical staff such as software developers where men far outnumber women. Amazon's experimental recruiting engine followed the same pattern, learning to penalize resumes including the word "women's" until the company discovered the problem.²¹ (Tugend, 2018)

Unfortunately, the subject of underrepresentation and lack of diversity does not only impact the field of Science, Technology, Engineering and Mathematics (STEM), but also the field of the arts long before Artificial Intelligence was used as a medium for art production. Mary Beth Edelson, an American printmaker and collage artist is considered "an early pioneer in the feminist art movement" (Smith-Stewart, 2015) and has tried extensively through her work to criticize this phenomenon. As discussed by curator Amy Smith-Stewart:

"Edelson asks us to scrutinize our cultural evolution, its build-ups and breakdowns, its developing legacy, through the lens of individual accounts collected and imparted publicly. [...] she assumes the role of archivist, curator, and caretaker, offering up a re-presentation of our greater social narrative. to name a few, have actively portrayed in their works the lack of diversity standards of the art industry as well as the lack of visibility for women."²² (Smith-Stewart, 2015).

In her collage *Death of the Patriarchy/Anatomy Lesson*, (1975) shown below (Fig.1), Edelson appropriated Rembrandt's painting *The Anatomy Lesson of Dr Nicolaes Tulp* (1632) (Fig. 19), and replaced the all-male painting figures with pictures of herself and other female members of the A.I.R. collective²³. (Collischan, 2010, p. 201).

²¹ Alina Tugend. "The Commonality of A.I. and Diversity." *The New York Times*. November 06, 2018. Accessed March 14, 2019.

²² Smith-Stewart, Amy. "Mary Beth Edelson: Six Story Gathering Boxes (1972–2014)" *The Aldrich Contemporary Art Museum*. Archived from the original (PDF) on 18 March 2015. Accessed 17 March 2019. <https://web.archive.org/web/20150318155740/http://aldrichart.org/pdf/EdelsonBrochure.pdf>

²³ A.I.R. is a feminist artist-run organization based in New York. As a feminist artist-run organization, with a self-directed governing body, A.I.R. is an alternative cultural institution and is supported by its network of active artist participants. It's existence proved to be fundamental in the careers of artists so diverse as Nancy Spero, Ana Mendieta, Mary Beth Edelson, Judith Bernstein and many more. (Frieze, n.d.)



Fig. 1 Mary Beth Edelson
 Death of the Patriarchy/Anatomy Lesson, 1975
 Lithograph print - 27 3/8 x 43" (69.5 x 109.2 cm)
 © 2019 Mary Beth Edelson

Along with the work of many other highly influential artists of her time, Edelson's work brings us to a new generation of female artists working with AI like Berlin-based artist Hito Steyerl. Steyerl is a visual artist and theorist who has significantly discussed data discrimination and the ethical pitfalls of AI. In a conversation with Kate Crawford, humanities researcher, she explained how modern approach on AI data analysis has evolved in recent years:

"As far as I understand it, statistics have moved from constructing models and trying to test them using empirical data to just using the data and letting the patterns emerge somehow from the data. This is a methodology based on correlation. They keep repeating that correlation replaces causation. But correlation is entirely based on identifying surface patterns, right? [...] If one takes a step back, one could argue that we need more diverse training sets to get better results, or account for more actual diversity on the level of AI face recognition, machine learning, data analysis, and so on."²⁴ (E_flux, 2017)

²⁴ E_flux. "Hito Steyerl and Kate Crawford on Stupid AI and the Value of Comradeship." E_flux. January 27, 2017. Accessed April 09, 2019. <https://conversations.e-flux.com/t/hito-steyerl-and-kate-crawford-on-stupid-ai-and-the-value-of-comradeship/5957>.

Steyerl's latest AI installation titled "The City of Broken Windows" (2018), is an installation of complex sound-art which was produced by recordings of smashed window sounds mixed with AI academics discussions. In particular, Steyerl used machine learning to "teach" AI how to actually smash glass using sound. She then curated the sounds used by the algorithm through mixing it with interviews by AI scholars.

Recorded in an airplane hangar in the United Kingdom, thousands of windows were smashed, creating a discordant symphony. Disseminated throughout the space, the sound is accompanied by wall-mounted text elements drawn from interviews with artificial intelligence researchers. At the conclusion of the installation, a large window within the historical space of the museum, the Manica Lunga, will be left shattered, with its remnants left on display on the floor.²⁵ ("Graham Foundation Grantees Hito Steyerl." n.d.).

Hito Steyerl's artistic and theoretical work provides a very important link to the overall subject of AI data. Indeed, one could look into her smashing windows work as a metaphor for the potential impact of AI data on the final output. Consequently, it is essential to carefully review the "mass deception" on the authorship question of Artificial Intelligence as an artist, as it entails the substantial risks of further establishing control institutions above control that might risk the prevalence of a perpetually inegalitarian culture as we will further discuss. As Judith Butler explains in *Gender Trouble* (1990) "without an agent, it is argued, there can be no agency and hence no potential to initiate a transformation of relations of domination within society" (Butler, 2006. p.34). What seems to eventually occur with AI, is that the more the subject is complicated and misunderstood and regulations do not apply to its data sets or functions, the easier it becomes for the stakeholders involved to continue the production of algorithms that strongly reflect their creators prejudices or world views.

Cyberspace cannot remain innocent. It is a matrix of human values. It carries a psychic charge. In the cyberculture, to construct art is to construct reality, the networks of cyberspace underpinning

²⁵ "Graham Foundation Grantees Hito Steyerl." Graham Foundation. Accessed April 07, 2019.

our desire to amplify human cooperation and interaction in the constructive process.²⁶ (Ascott, 2007. p. 283).

The human values that hide within data as Ascott explains, are what we need to be reviewing should we wish to identify authorship and responsibility in AI in general and its artistic applications in particular. If the makers of the technological models represent a distinctive majority of a social group, then there is a risk that gender or racial stereotypes will be perpetually preserved under a systematically controlled AI.

Looking into the innovations of the field of AI in its artistic applications, those are inevitably driven mainly by big technology corporations that have the human and financial capital to sponsor this type of experiments. The Google Brain Team, a collective of Machine Learning (ML) researchers, announced in 2016 that they would be launching a project called “Magenta” which aimed to integrate the latest technology methods in a visual and musical production context.

Magenta was started by some researchers and engineers from the Google Brain team, but many others have contributed significantly to the project. We develop new deep learning and reinforcement learning algorithms for generating songs, images, drawings, and other materials. However, it is also an exploration in building smart tools and interfaces that allow artists and musicians to extend (not replace!) their processes using these models. We use TensorFlow and release our models and tools in open source on our GitHub.²⁷ (Google AI research, n.d.

Before elaborating on the content of this type of initiatives, we should define what terms like Deep Learning (DL) or Machine Learning (ML) mean. Starting with the latter, Machine Learning is a “computational method that provides systems the ability to automatically learn and improve from experience without being explicitly programmed” (ExpertSystem, 2017) while

²⁶ Ascott, Roy. *Telematic Embrace: Visionary Theories of Art, Technology, and Consciousness*. Edited by Edward A. Shanken. Berkeley, CA: University of California Press, 2007. p.283

²⁷ "Magenta – magenta.tensorflow.org." Google. Accessed April 07, 2019.

Deep Learning is a "Machine Learning technique that “teaches computers to learn by example” (Mathworks, n.d.).

Called deep neural networks, these complex mathematical systems allow machines to learn specific behavior by analyzing vast amounts of data. By looking for common patterns in millions of bicycle photos, for instance, a neural network can learn to recognize a bike. This is how Facebook identifies faces in online photos, how Android phones recognize commands spoken into phones, and how Microsoft Skype translates one language into another. But these complex systems can also create art. By analyzing a set of songs, for instance, they can learn to build similar sounds.²⁸ (Metz, 2017)

We understand that the proper function and architecture of methods like Deep Neural Networks, is relying on a robust foundation of a human created input, whether that is the data or the vision to create a particular output, making AI merely a tool to accelerate and facilitate a task we physically would need more time to perform. The Magenta project allows for the same structures which would design the software running on phones or computers also producing innovative tools to create art and “furthering the creativity process” (“Project Magenta: Music and Art with Machine Learning (Google I/O '17).”, 2017). Indeed, although the intentions of the corporate research team is to further evolve our current tools of art production and not to replace artists, they as producers of the technology will be using a tool that carries inevitably someone else’s input along with theirs. That someone is the post-industrial human capital as it was defined by the concept of “information society” as developed by the sociologist Daniel Bell:

[...]By information I mean data processing in the broadest sense; the storage, retrieval, and processing of data becomes the essential resource for all economic and social exchanges... By knowledge, I mean an organized set of statements of facts or ideas, presenting a reasoned judgment or an experimental result, which is transmitted to others through some communication medium in some systematic form.²⁹ (Bell, 1979, p.549)

²⁸ Metz,Cade. How A.I. Is Creating Building Blocks to Reshape Music and Art, The New York Times, Aug. 14, 2017, Accessed March 14, 2018

²⁹ Bell, Daniel .*The Social Framework of the Information Society*. (1979) Dertoozos, M. L., Moses, J. (eds.), The Computer Age: A 20 Year View, Cambridge, MA: MIT Press, p. 549.

The produced and reproduced human-created and curated input comprises of the vast Big Data sets that become the encyclopedia for AI algorithm's education. The words "learning" and "model training" allude to the methods used to train the models with a particular "syllabus" to act in the way that is expected to. An example to make this clearer could be that we need to teach the Machine Learning algorithm what a bird is and how it is supposed to look like by providing it with numerous pictures or drawings of birds until it can identify or draw (in the case of creative AI) a bird on its own. The bird as the sign-signifier would need to be tagged with a meaning-signified. However, if we were to mix among the bird images, images of chicken (to be best defined as fowls or poultry), the algorithm would not see the difference, and the chicken would be considered similar to a sparrow. Furthermore, to ensure that the algorithm has the most complete education possible, the data selector should also provide the software with pictures and videos that present birds in their natural habitat, in movement and still, for the training to be able to capture what a human eye would through years of empirical observation of the world.

As Barthes best explained in his *Rhetorics of the image* (1964), "the image, in its connotation, is thus constituted by an architecture of signs drawn from a variable depth of lexicons (of idiolects)" (Barthes, 2010 p. 46). This variable therefore highly depends on one's individual vocabulary which carries their own cultural references and prejudices.

There is a plurality and a co-existence of lexicons in one and the same person, the number and identity of these lexicons forming in some sort a person's idiolect. [...] The variability of readings, therefore, is no threat to the 'language' of the image if it be admitted that that language is composed of idiolects, lexicons and sub-codes.³⁰ (Barthes, 2010, p.47)

Reviewing data labelling as a complex and time-consuming process, we should take into account the infinite variables of one's individual perceptions on one single object. Along with the immense volume of data to be categorised for an AI algorithm to "learn" how to distinguish a

³⁰ Barthes, Roland, and Stephen Heath. *Image, Music, Text*. 1977 "The Rhetorics of the Image" (1964) Fontana Press, Harper-Collins Publishers, 2010 p. 47

certain sign from another, it becomes evident that not only we are missing valuable insight into the database classification but it is quite possible that the database labelling process often might neglect crucial cultural and individual factors.

The complex nature of data selection, categorisation and labeling is a crucial step for the later on proper function of the AI interpretation and output. As the further development of Deep Learning is highly data-centric, the quality of this input becomes pivotal and raises concerns that are linked to transparency, diversity, and appropriate policies to structure these developments that are currently largely dependent on companies good intentions. Assuming that AI will be further established in the field of art production but the technology itself will be largely pre-developed by the same stakeholders, the medium will perpetuate the same faults. With such diversity discrepancies and - proven to be- biased outcomes, what is the likelihood that future art production will not resemble the previous societal standards of times when human rights were largely unestablished?

The art world is not immune to these issues. On the contrary, in 2015, the Rijksmuseum in Amsterdam updated the titles of the artworks exhibited to replace words with negative racial connotations from the artworks descriptions with respectful ones. British broadcaster and critic Bidisha discussed that decision by criticising the numerous museums which have not followed the same example:

Talking about language, titles, plaques and statues to confront the ignorance and prejudices of the past is only the tip of a very toxic iceberg. We have less social mobility than ever before and every single elite profession, from the arts and culture to the media, finance, law and medicine, is dominated by white men. There is a heavy and painful sexual and racial glass ceiling and the white men's club mentality is stronger than it ever was – as always in times of economic instability, when cronies with established power close ranks.³¹ (Bidisha, 2015)

³¹ Bidisha, *It's time for the arts world to look hard at its own racism*, The Guardian, published Dec 19, 2015, Accessed March 13, 2019

It becomes imperative that the analysis regarding AI-produced art should also address the significant risk related to the increased dependency on past examples of art production to teach algorithms what to paint. How can we ensure that the medium does not reproduce the outdated and dismissed since then societal and economical biases that lurk around semiotics?

An additional AI technology development which has been applied to art production recently, is Generative Adversarial Networks, an unsupervised class of Machine Learning. Before further discussing GANs we should also clarify the difference between supervised and unsupervised neural networks. Although it might sound self-explanatory, discussing supervised versus unsupervised learning in Artificial Intelligence does indicate a certain autonomy for the algorithm. In unsupervised learning processes, the main difference concerns the specific definition of a desired output. In both cases, although the term is misleading, the algorithm acts under an engineer's command.

It is called supervised learning because the process of an algorithm learning from the training dataset can be thought of as a teacher supervising the learning process. We know the correct answers, the algorithm iteratively makes predictions on the training data and is corrected by the teacher. Learning stops when the algorithm achieves an acceptable level of performance. [...]

Unsupervised learning is where you only have input data (X) and no corresponding output variables. The goal for unsupervised learning is to model the underlying structure or distribution in the data in order to learn more about the data. These are called unsupervised learning because unlike supervised learning above there is no correct answers and there is no teacher. Algorithms are left to their own devices to discover and present the interesting structure in the data.³² (Brownlee, 2019)

Accordingly, GANs are a method for art production which does not require the specification of a certain output. The algorithm is taught to draw through the use of two neural networks that are working “against” each other to improve their respective results. Ian Goodfellow along with other computer science researchers formally defined the GANs function only in 2014 as the

³² Brownlee, Jason. *Supervised and Unsupervised Machine Learning Algorithms. Machine Learning Mastery*, Published on Mar. 16, 2016. Accessed on March 11, 2019

“new framework for estimating generative models via an adversarial process” (Goodfellow, 2014, p.1). The first network attempts to generate convincing visual results based on data previously provided while the second, acts as its adversary and judges whether it can distinguish convincing from less convincing outputs, again through the use of previously provided data. GANs are perhaps the most common AI application that most artists to be mentioned are currently experimenting with for the creation of either composing music, generating drawings or videos, and other materials in a semi-autonomous manner.

An example of how this technology is being applied to poetry, is a sonnet written by GANs and designed by a research scientist of the global mass-media corporation Thomson Reuters. In the company’s blog it is mentioned that Charese Smiley and Hiroko Bretz were awarded the “Turing Tests in the Creative Arts” for their work. “I liked our winning poem and I also think it is possible for a computer to make a moving and meaningful piece of art. But I don’t think a computer can make intentional effort the same way humans do, and it has to depend on coincidence.”(Thomson Reuters Blog, 2017). The winning sonnet produced by AI was awarded as a convincing sample that could be written by a real person:

And be very careful crossing the streets.
How fair an entrance breaks the way to love!
Left, doors leading into the apartments.
Just then a light flashed from the cliff above.

The fields near the house were invisible.
Objects of alarm were near and around.
The window had only stuck a little.
From the big apple tree down near the pond.

The large cabin was in total darkness.
Come marching up the eastern hill afar.
When is the clock on the stairs dangerous?
Everything seemed so near and yet so far.

Behind the wall silence alone replied.
Was, then, even the staircase occupied?³³
(Thomson Reuters Blog, 2017)

The awards which are named after scientist Alan Turing, considered by some as the father of Artificial Intelligence, intend to test “whether people can distinguish between human and algorithmic creativity” (Neukom Institute, n.d.). The Director of the Dartmouth College Neukom Institute for Computational Science Dan Rockmore further explains:

It's a challenge to produce a moving piece of literature, and I think in challenging yourself to try to do it, it makes you think hard about what moves you about a story, what goes into making a story...Thinking hard about those questions has a long tradition in the humanities, so it's just another way in which we can bring another lens to that, not in order to replace it but just to honestly consider it.³⁴ (neukom Institute - Turing Tests in Creative Arts, n.d.)

Hence, it becomes obvious that Computer Science field researchers along with technology corporations actively engage in the further development of Artificial Intelligence creative applications. The Turing test as the final confirmation of the algorithms capacity to generate art is in fact based on the scientist's 1950 paper titled *Computing Machinery and Intelligence* in which he defined the test as the imitation game.

There are different versions of the test, all of which are revealing as to why our approach to the culture and ethics of A.I. is what it is, for good and bad. For the most familiar version, a human interrogator asks questions of two hidden contestants, one a human and the other a computer. Turing suggests that if the interrogator usually cannot tell which is which, and if the computer can successfully pass as human, then can we not conclude, for practical purposes, that the computer is “intelligent”?³⁵ (Bratton, 2015)

³³ "Putting the Art in Artificial Intelligence." Thomson Reuters Blog, July 24, 2017. Accessed March 11, 2019

³⁴ "About." Neukom Institute Turing Tests in the Creative Arts. n.d. Accessed March 20, 2019.

³⁵ Bratton, Benjamin. “Outing A.I.: Beyond the Turing Test”, *The Stone - New York Times Blog*, Feb 23, 2015 Accessed Mar 12, 2019 <https://opinionator.blogs.nytimes.com/2015/02/23/outing-a-i-beyond-the-turing-test/>

Assuming that the single proof of human intelligence lies in its capacity to distinguish the creator of something by a look, we can further perhaps deduct where does the intelligence come from in Artificial Intelligence. Should I perhaps compare a ceramic plate made by a factory production machine to one that a human craftsman made, it is certain that the factory one will be flawless. But it would certainly not imply any intelligence from the industrial production process.

Although relatively new, most of the popular applications of GANs in visual arts have not been ground-breaking, with members of the technological community either experimenting with the reproduction of historical paintings and styles or abstract designs that represent the initial process of the algorithm training. Sometimes, these research projects even anthropomorphize the medium with a representative example the smart painting tool AICAN created by Rutgers University research lab. In the website of the project AICAN is introduced as “an Artificial Intelligence Artist and a Collaborative Creative Partner.” (AICAN, n.d.) In a similar misrepresentative tone, the French collective Obvious described their artworks as autonomously made:

The work was made without human intervention by a machine using an artificial intelligence system called Generative Adversarial Networks (GAN). It works by mimicking characteristics of images in a training data set (in this instance, paintings from the 14th to the 18th centuries) until it can fool an observer into thinking the image is human made.³⁶ (Obvious, n.d)

Further in our research, we will be looking into both of those cases closely in order to investigate the artist role, while attempting to guess their intentions and how previous art was appropriated for their creation.

Although the objective is to clearly demonstrate that machines are not autonomously acting when producing art, what is important to acknowledge regarding the Machine Learning algorithms to be discussed, is that they function in an impressive speed and are capable of a

³⁶ Obvious, “OBVIOUS”, n.d. Accessed March 11 2018

much more elaborate analysis of data than the human mind is, in a split second. Nevertheless, they are highly dependent on human input of their creator, allowing them a specific computational intelligence but not actual artificial independence. Their overall efficiency is eventually interrelated with data quality, labels and overall categorisation, while the functions to be performed are also eventually dictated by the software engineer, making Artificial Intelligence an impressive supportive tool but not an independent reasoning being.

Leveraging the detailed analysis of the case studies to be reviewed we will be able to identify the specific steps taken by people involved as the idea generators but also as the individuals who fine-tune the progress of the implementation along with their curatorial distribution to the final results.

Consequently, it becomes clear that AI is an abstract term to be used throughout this research to frame different machine learning methods that artists and creatives can use in an artistic context.

2.2 Computational art in diverse applications

As previously mentioned, the algorithms are not independent to the people who design and refine them. Therefore in the last years, just like the AI-written sonnet, we witnessed an increased number of various artistic experiments which put to the test AIs latest developments towards creative and cultural outcomes including the production of music, visual or performing arts. In this part, we will be looking into some examples of AI-produced artworks either from established artists who are utilising Machine Learning in their practice or as products of open source AI that has circulated the internet and could provide a better basis of understanding for the chapters to follow.

What became probably the most rapidly known application of AI in a cultural context, was the algorithm “Deep Dream”, published by Google as open-source in 2015. An open-source program can best be defined as a software for which the original code is published and can therefore be altered or used for free by anyone for any purpose. The algorithm in question, was designed by Google engineers to first recognise visual patterns in pictures and then create an image loop which would repeat these patterns as shown in the compilation of images below (Fig. 2):

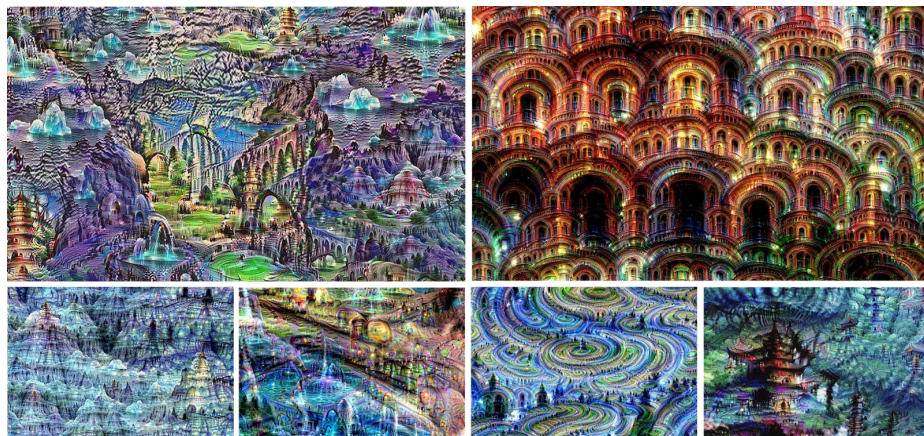


Fig. 2 MIT Computer Science and AI Laboratory
Neural net “dreams”, 2015
Digital copy of images - unknown dimensions
Courtesy of Google Inceptionism Online Gallery

The artificial neural networks used by Google work out what's in an image by analyzing layers until they finally decide on what it shows. "For example," Google engineers wrote in June, 'the first layer maybe looks for edges or corners. Intermediate layers interpret the basic features to look for overall shapes or components, like a door or a leaf. The final few layers assemble those into complete interpretations — these neurons activate in response to very complex things such as entire buildings or trees.'³⁷ (McCormick, 2015)

If one should look closer to the images produced using the original DeepDream, the unusual repetitive pattern is dogs and in particular, dog eyes. Highly unusual as that would seem, the explanation again lies with the data used to train it. According to online magazine Fast Company's sources, the data were taken "from ImageNet, a database created by researchers at Stanford and Princeton who built a database of 14 million human-labelled images". The article goes on to explain that the Google engineers only used a small part of the database in question "a subset which contained 'fine-grained classification of 120 dog sub-classes.'" (Brownlee, 2018)

The example of the dogs in DeepDream could provide perhaps the most visual representation of the impact of the human factor on data selection but also allows us to make an interesting parallel to the observations of art critic John Berger in 1991: "Nearly all modern techniques of social conditioning were first established with animal experiments. As were also the methods of so-called intelligence testing." (Berger, 1991, p.18) In 2015, DeepDream was indeed the first mass-accessed experiment of applying GANs to images and the coincidence of seeing dogs does allow perhaps to accidentally confirm Berger's rule. Although he does not directly refer to Artificial Intelligence or the power institutions that develop and diffuse most of the technology discussed throughout this research, his thoughts concern primarily popular culture representations of animals which force us to reflect on whether new mediums for art production like AI are merely one more way for us to look at animals or other visualisations of our lives through an additional lens.

"The images exist thanks only to the existence of a technical clairvoyance." (Berger, 1991, p.22).

³⁷ McCormick, Rich. "Fear and Loathing in Las Vegas Is Terrifying through the Eyes of a Computer." The Verge. July 07, 2015. Accessed March 14, 2019.

That process of social conditioning is also relevant to this research as the algorithmic learning operations are modeled after the human learning processes and inevitably carry the same obvious or less obvious societal impact that was projected upon its creators. As we are all eventually subjected to the same influences exerted through the popular culture, “we are the victims of an illusion which leads us to believe we have ourselves produced what has been imposed upon us externally” (Durkheim, 1982, p.53).

The technical clairvoyance mentioned by Berger, could perhaps best be seen in the example of the 2017 art exhibition “Unhuman: Art in the Age of AI” presented during STATE Berlin's Festival for Open Science, Art, and Society. The project was curated by Emily Spratt and the artist behind the 12 images printed on metal sheets, was the algorithm AICAN as designed by Professor Ahmed Elgammal, who is also the Director of the “Art & AI Lab” in Rutgers University.

Intentionally interrogating the definition of artistic authorship, the concept of creativity, and the meaning of computer-generated art, at the core of this exhibition is an exploration of the role of boundaries in safe-keeping those seemingly inimitable qualities that we consider the hallmarks of the human experience. To understand what is human, we ask what is unhuman?³⁸

(Unhuman: Art in the Age of AI, STATE, n.d.)

The exhibition was only the beginning for AICAN which has since been showcased in Art Basel and other art festivals by its creator, with the intention to test whether humans would be able to tell the difference between a work made by a human and a work made by AI. The method used for the creation of the works is a variation of GANs that was defined by Elgammal as Creative Adversarial Networks in a paper titled “CAN: Creative Adversarial Networks, Generating "Art" by Learning About Styles and Deviating from Style Norms” published in 2017. In the paper Prof. Elgammal and his team introduce CANs as follows:

³⁸ STATE. “Unhuman: Art in the Age of AI”, n.d. Accessed March 12, 2018

We propose a new system for generating art. The system generates art by looking at art and learning about style; and becomes creative by increasing the arousal potential of the generated art by deviating from the learned styles. [...] We propose modifications to its objective (refers to GANs) to make it capable of generating creative art by maximizing deviation from established styles and minimizing deviation from art distribution. We conducted experiments to compare the response of human subjects to the generated art with their response to art created by artists. The results show that human subjects could not distinguish art generated by the proposed system from art generated by contemporary artists and shown in top art fairs. Human subjects even rated the generated images higher on various scales.³⁹ (Elgammal, 2017, p.1).



Fig. 3 AICAN by Elgammal
"Unhuman: Art in the Age of AI" 2017
pop-up gallery in Los Angeles
Photograph published by CBS NEWS



Fig. 4 AICAN by Elgammal
ICH BIN EIN BERLINER 2017
The Art & AI Lab, Rutgers University
Photograph by STATE Berlin Festival

Reading the abstract for the technology that was used to create AICAN it becomes obvious that the production of convincing “art” is the sole objective of the initiative. In fact, there is something deeply problematic in the purpose to massively produce artworks whose only objective is to trick the human eye but does not mention other objectives related to ideological or aesthetic criteria. In a view of art displayed as a commodity, it seems that the AICAN paintings teleology is only the similarity of the artworks with other works done by real artists which makes the project arguably less artistic.

³⁹ The paper titled “CAN: Creative Adversarial Networks, Generating "Art" by Learning About Styles and Deviating from Style Norms” was published on June 21st 2017 as a collaborative research by Ahmed Elgammal, Bingchen Liu, Mohamed Elhoseiny and Marian Mazzone.

The prints produced by the AICAN algorithm, do not differ substantially from other GAN generated works that we will be looking at, and resemble perhaps the style exhibited by artists, especially abstraction representatives, such as Gerhard Richter or Barnett Newman or any artist who attempted to depict their feelings, connect with their viewer, themselves or the occult through their works by deferring from realism.

When designing the algorithm, we adhered to a theory proposed by psychologist Colin Martindale. He hypothesized that many artists will seek to make their works appealing by rejecting existing forms, subjects and styles that the public has become accustomed to. Artists seem to intuitively understand that they're more likely to arouse viewers and capture their attention by doing something new.⁴⁰(Elgammal, 2018)

Designed based on what has been expected to provoke the attention of audiences, AICAN certainly raises the question of whether novelty is the only prerequisite for an artwork to be compelling and steer the audience interest. The AICAN objective as presented by its creators, seems to be to produce images that do not adhere to the ones used to train it, approximately "80,000 pieces of art from the last 500 years" (Kim, 2018). When considering the criteria taken into consideration to produce the works by AICAN it certainly seems that 1) the conception that any picture is art applies and 2) art is viewed as a commodity which to be appreciated should abide to rules such as commercial success. As David Hare attempted to clarify, "Once an artist begins to use originality as an attribute which is his, once the public begins to go out of their way to look for it, its meaning is lost"⁴¹ (Hare, 1964, p.140). Without the clear identification of an artist who wishes to use matter in order to create a visual result expressing a feeling, an intention or a message to the viewer other than "this is different, you will like it", it arguably becomes challenging to consider the works presented previously as artworks that would have a significant impact on the viewer.

⁴⁰ Ahmed Elgammal, "75% of people think this AI artist is human", Fast Company, October 19, 2018, Accessed: February 16, 2019 <https://www.fastcompany.com/90253470/75-of-people-think-this-ai-artist-is-human>

⁴¹ Hare, David. "The Myth of Originality in Contemporary Art." *Art Journal* 24, no. 2 (1964): 139-42. doi:10.2307/774783.

Still, Machine Learning as a new art production tool has not simply been applied in an impersonal function as there have been significant artists who utilised methods of AI to produce art. A more recent example of how the algorithm can be used in a creative context that expands further than simply mimicking works previously painted by famous painters, is the case of artist Anna Ridler who has been experimenting with the interdependencies of Generative Adversarial Networks to produce original artworks. GANs have been the most frequent Machine Learning classes to be used by artists for the creation of original or less original works of art. Although we will be closely reviewing a project using GANs in Part II, it would be interesting to look into other algorithm applications that are not misrepresented as autonomous but instead create original and artistic visual outputs by clearly identified artists. The artist and researcher's ongoing work in the visual generation of tulips (Fig.5) which blossom depending on the cryptocurrency bitcoin prices can be seen in the still of the project video as shown in her Vimeo channel.



Fig. 5 Anna Ridler,
still of the “Mosaic Virus” project (2018-today)
Video art
Anna Ridler Vimeo channel

“Drawing historical parallels from “tulip-mania” that swept across Netherlands/Europe in the 1630s to the speculation currently ongoing around crypto-currencies, this video work is generated by an artificial intelligence (AI). It shows a tulip blooming, an updated version of a Dutch still life

for the 21st century. The appearance of the tulip is controlled by bitcoin price. “Mosaic” is the name of the virus that causes the stripes in a petal which increased their desirability and helped cause the speculative prices during the time. In this piece, the stripes depend on the value of bitcoin, changing over time to show how the market fluctuates.”⁴² (Riddler, n.d.)

Ridler, used GANs in a novel way as she draws the data that train the algorithm from changing values allowing her work to be unpredictable and continuously changing. The parallel drawn among the 17th century tulip investment frenzy and the cryptocurrency market that emerged some years ago, certainly deserves attention as she takes a medium that is generated by a perhaps similar AI-mania and uses it as a tool for criticism.

In a similarly contemporary spirit, Nye Thompson a UK artist is working with the representation of the intersections among the virtual and the physical world. Her work leverages Machine Learning and online databases to produce art projects such as “The Seeker” (2018), a series of AI drawings that use words to describe the images capture through unprotected cameras.

My work involves the creation of artist-software-systems in order to explore the impact of new technology paradigms. I’m particularly interested in the relationship between the embodied and the virtual; our evolving sense of what it is to be human and the social/psychological impact of living in a world of connected objects and nascent AIs.⁴³ (Thompson, n.d.)

⁴² Riddler, Anna, "Mosaic Virus work in progress", Anna Ridler, Accessed: March 11, 2019

⁴³ Thompson, “Artist statement”, Nye Thompson, Accessed: March 11, 2019

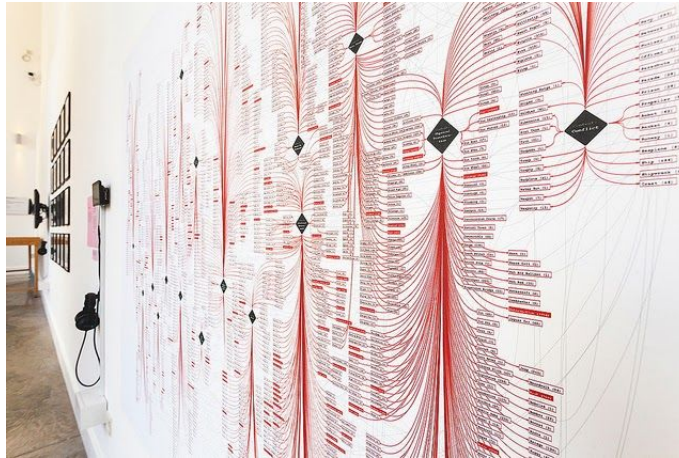


Fig. 6 Nye Thompson
 “Words that Remake the World” - The Seeker, 2018
 Unknown dimensions
 Artificially Intelligent display ©Victoria and Albert Museum

The drawing produced and shown here is not the mere product of AI but a curation of the words and phrases the algorithm “saw” in the pictures that were collected. “The drawing represents a process of intense analytical scrutiny of this data by the artist, attempting to map the nascent AI’s “mind”. (AI Art Gallery, 2018).

By looking into examples previously provided, it becomes certainly visible that artists like Riddler and Thomson are utilising AI as a tool for the completion of their works and are not solely looking to improve the aesthetics of their works or further automate their roles but they actually allow for a thorough examination of the conditions that postmodern society experiences in relation to digital tools.

One more recent example of interesting AI applications in an artistic context is “Deep Angel” (2018) that examines what its creators discuss as “The Aesthetics of Absence” (Deep Angel, “AI, Media, and the Aesthetics of Absence”, 2018, Accessed: March 11, 2019). Deep Angel’s main function is the disappearance of objects from pictures and videos that allows for an aesthetic result that lingers to abstraction but also visually leaves a trace of where the object used to be. The AI algorithm was created by Matt Groh, Ziv Epstein, Manuel Cebrian and Iyad Rahwan

(part of the MIT Media Lab) who were inspired by the 1920 monoprint “Angelus Novus” (Fig.8) by artist Paul Klee.



Fig. 7 Matt Groh, Ziv Epstein, Manuel Cebrian, Iyad Rahwan
Image generated with Deep Angel tool
Photo © Deep Angel

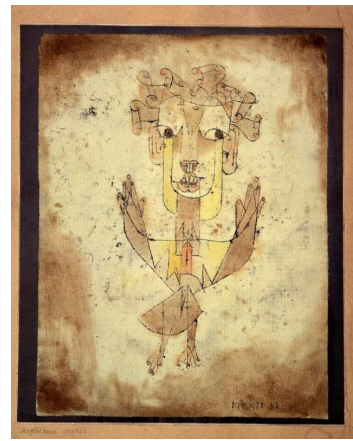


Fig. 8 Paul Klee
Angelus Novus (1920) monoprint
Photo © The Israel Museum, Jerusalem

Eventually, what AI-generated images, paintings and installations, bring into the light is the technology which is already present in many facets of our everyday lives, and perhaps well-thought and professional artworks could become a necessary medium to increase the social dialogue and the public's sensitisation to the rapid development of AI and digital systems.

2.3 The problematic of artificial authorship: Who is the author in AI

Whether we refer to the artist as a person with a clearly defined identity or the artist as a symbolic figure that comes to accomplish a certain mission, looking into art history and philosophical critique, the role of the author was a constant subject for debate. It could be argued that AI art is simply attempting to present a familiar image by using an unfamiliar medium, much like photography did when it first came out. However, the intelligence and automation which is presupposed in AI requires us to look into the authorship question from a new angle.

During the 20th century, human agency was further elaborated among post-structuralism thinkers like Roland Barthes or Michel Foucault who tried to deconstruct the traditional author to highlight the importance of the audience perception in the case of Barthes (cf. Barthes, 1967) and in the different functions of the author in the case of Foucault (cf. Foucault, 1969). As we will be discussing in detail, thinkers of the mid-20th-century, attempted to redefine as a variable what was previously established to have a straightforward answer.

During the sixties, the birth of a counterculture that marked a highly complex and transformative period, promoted a cultural and political dialogue that attempted to address the rapidly consumeristic, and morally bankrupt society of the days. Under the eye of the Cold war between the US and Russia and with continuous protests that advocated peace, racial and gender equal rights more or less all over the world, certain theories took on the task to investigate the distance between the perceiver and the perceived in the new order of things. Philosophers of the time, asked questions such as who is the author, and whether the existence of the author is relevant or how can the clearly identified agency influence our final appreciation of the aesthetic result. All of those questions, become more pertinent when discussing the literal depersonification of the author in the form of Artificial Intelligence.

Roland Barthes presented in his essay *The Death of the Author* (1967) perhaps one of the most influential viewpoints on the subject of the author, which came to examine the role of the “narrator” in a way that moves away from the previously established views that were either

focused solely on the individual, or his complete volume of previous works or a more theological interpretation. It is important to review Artificial Intelligence through the authorship theory as its structure strongly relies to semantics and words that act as the tags which will eventually train the AI to act in a certain way. For Barthes, more than just a real person with a name and identity, the author disappears and this concept is also very suitable in the overall Deep Learning structure as in a similar way, we only review its function through the final output.

As soon as a fact is narrated no longer with a view to acting directly on reality but intransitively, that is to say, finally outside of any function other than that of the very practice of the symbol itself, this disconnection occurs, the voice loses its origin, the author enters into his own death, writing begins.⁴⁴ (Barthes, 1977, p.142)

According to Barthes, there is a transcendence that takes place as soon as the author assumes his role. In the AI reference, the author or authors enter their own death by default as the purpose of their existence is clearly not related to the production of the end result. In fact, although the output is significantly relative to the input, the digital technology culture does not focus that much on the authors or their identity since their personal individual inputs are lost in the multitude of data. The individual is thus masked under the collective corporate production machine. It is precisely in regards to that disappearance that Foucault further wished to discuss not the solely the existence or not of a unique individual but his or her different *author functions* within the text (Foucault, 1998. p.209). While some theorists since, have interpreted his analysis as an abolishment of the author just like Barthes, this research will be looking at the foucauldian view as the importance of the meaning of the author's role and how its definition becomes a variable instead of a constant. Thus, in order for us to explore the idea of authorship in Artificial Intelligence created art, we would need to dive into the widely discussed perspectives on the subject as previously elaborated, and examine the impact of the existence of an artist not only for the aesthetic appreciation of artworks but also to appropriately identify ethical and cultural pitfalls in the digital era.

⁴⁴ Barthes, Roland, and Stephen Heath. *Image, Music, Text*. 1977 London: Fontana Press, Harper Collins Publishers, 2010 p. 142

Furthermore, we can examine the subject from different angles that can be either author-focused, artwork-focused or spectator-focused but all three could be inevitably linked to the long discussed question on what is art's role and function. Although this research does not aim to address the long-lasting debate on the subjective perception of what is art, it would be useful to clarify prior to further elaboration that the role and function of AI as an artist is also linked to the key concepts of identity, responsibility and context. Simply put, could we be discussing artworks if there is no artist?

As we will be seeing further in the research and the case study analysis, artists and Machine Learning researchers have increasingly attempted to apply AI technology in a more artistic context, either to produce a tool for artists or an actual artwork. The case of Mario Klingemann, German artist also known as Quasimondo, is one that allows for a very clear personification of who the artist is and does not attempt to misrepresent the technology as autonomous. Klingemann is a German artist who has been working neural networks to produce visual art (further to discuss his work in chapter three). However, other cases like AICAN, or the French Obvious collective, attempt to present the creative force as solely artificial:

AICAN is an Artificial Intelligence Artist and a Collaborative Creative Partner. Each artwork AICAN makes is an answer to the question "If we teach the machine about art and styles and push it to generate novel images that do not follow established styles, what would it generate?"⁴⁵ (AICAN, n.d.)

The algorithm in question is designed by Professor Ahmed Elgammal from Rutgers University who is also the head of AI & Art Lab. As one can read in the university's website and numerous online articles published concerning the project, the focus of the team was to create images that are new in the sense that either the structure or patterns as identified through a computer vision algorithm have never been created before.

⁴⁵ "Concept", AICAN, n.d. Accessed: Jan 24, 2019. <https://www.aican.io/>

AICAN stands for "Artificial Intelligence Creative Adversarial Network" and while it utilizes the same adversarial network architecture as GANs, it engages them differently. Adversarial networks operate with two sets of nodes: one set generates images based on the visual training data set that it was provided while the second set judges how closely the generated image resembles the actual images from the training data. AICAN pursues different goals. "On one end, it tries to learn the aesthetics of existing works of art," Elgammal wrote in an October FastCo article. "On the other, it will be penalized if, when creating a work of its own, it too closely emulates an established style." That is, AICAN tries to create unique -- but not too unique -- art.⁴⁶ (Tarantola, 2019)

Therefore, evaluating those "new" instances of self-proclaimed autonomous artists, requires us to start with a focus on the author and the subject of identity, or in this case, the abstract identity. Foucault recommended in his analysis that instead of discussing the death of the author by looking at solely the subject, we should also be looking at the authorship as a source of further meaning. The function of a name of an author for Foucault can make a significant difference as we would not be reading Aristotle in the same manner should he not also represent "the author of the Analytics," "the founder of ontology," and so forth" (Foucault, 1998, p.254). He finally defines the different *author functions* as follows:

They can be summarized as follows: (1) the author function is linked to the juridical and institutional system that encompasses, determines, and articulates the universe of discourses; (2) it does not affect all discourses in the same way at all times and in all types of civilization; (3) it is not defined by the spontaneous attribution of a discourse to its producer but, rather, by a series of specific and complex operations; (4) it does not refer purely and simply to a real individual, since it can give rise simultaneously to several selves, to several subjects-positions that can be occupied by different classes of individuals.⁴⁷ (Foucault, 1998. p.261)

⁴⁶ Tarantola, Andrew. "AICAN Doesn't Need Human Help to Paint like Picasso." Engadget. February 22, 2019. Accessed March 13, 2019.

⁴⁷ Foucault, Michel, and James D. Faubion. *Aesthetics, Method, and Epistemology*. New York: New Press, 1998, p.261

In that way, Foucault attempted to clarify that the name of the author is not simply to be disregarded as insignificant but it carries within a whole context for the overall discourse that it represents. This theory presents a very useful idea for this research, as we are discussing Artificial Intelligence as an author in a completely different function that say a “traditional” artist, in a purely impersonal context. The institutional system that AI encompasses therefore would be the technological frame that commissions its creation and the different classes of individuals can be found among the teams that contributed to its creation, whether that was the definition of a certain output to be achieved, or the selection of data for its learning.

Indeed the primary function of an author behind AI would be to class data in a certain way. Looking at the connection between the way data collection or data labeling functions and its importance in the Machine Learning process, it is important to discuss this as a critical step which allows the individual to apply his or her personal prejudice in the categorisation of all sorts of data while remaining completely anonymous, much like the insignificance of the individual’s identity in scientific texts. Foucault also discussed the evolution of the importance of a name for authors depending on the type of text. In particular, when discussing highly technical subjects in science, the focus should not be upon one individual in particular but *truths* that are described in it. (Foucault, 1998: 212-213)

In artificial intelligence however, we rarely question whether there is truth or not in what is presented or if the author was mistaken, as there does not seem to be a specific person behind it. The notion of “technology”, much like the word “system”, as purely impersonal and vague subjects, providing an author who is already dead and has no responsibility. Therefore, when the results are inaccurate or something is not working as expected, we are likely to easily disregard it as there is no concrete author to take responsibility and consequently there is no further analysis of its output. AI provides in that aspect, the perfect representation of what Barthes proposed in his own analysis and makes the critique somewhat impossible and irrelevant.

Once the Author is removed, the claim to decipher a text becomes quite futile. To give a text an Author is to impose a limit on that text, to furnish it with a final signified, to close the writing.

Such a conception suits criticism very well, the latter then allotting itself the important task of discovering the Author (or its hypostases: society, history, psyche, liberty) beneath the work: when the Author has been found, the text is 'explained' - victory to the critic.⁴⁸ (Barthes, 1977:147)

Indeed, it would be impossible to identify with precision where do an algorithms deeper intentions or cultural influences come from, or which other works of art it is responsible for as those are hidden behind a complex technical structure. The responsibility of the software developer, or the person who compiled the database to be used for the training of the algorithm, are completely inapplicable, usually masked under a brand name such as Google, Microsoft or Apple while popular culture reproduces the idea of an unbiased, futuristic, independent superpower that can resolve any complex problem or completely replace a certain profession. What remains highly vague and unimportant, is the identity or the role of the individuals, under the management of a robust corporate structure, who inevitably applied their own set of implicit prejudice when designing an algorithm to operate in a certain manner, or labeled a specific picture with a particular word. For instance, the Google Art functionality "Is your portrait in a museum?", allows the user to match their face to an already created portrait. The application is powered by AI and with computer vision, the anatomical features of users in addition to skin complexion, identified gender and other markers, will define which portrait best matches their face. The viral spread of the application revealed also some concerns about the “racist” categorisation of the algorithm's function.

Joy Buolamwini, a Researcher at MIT Media Lab and founder of the Algorithmic Justice League, believes that such issues are created when teams of mostly white engineers create facial recognition algorithms based on their own recognition of facial features, which may contain racial biases from their upbringing and experiences. Despite the ability for these algorithms to learn through usage, a primarily white training library and user base will not help to improve the algorithms recognition of people of color.⁴⁹ (Goggin, 2018)

⁴⁸ Barthes, Roland, and Stephen Heath. *Image, Music, Text*. 1977 London: Fontana Press, Harper Collins Publishers, 2010.

⁴⁹ Goggin, B. "Is Google's Arts And Culture App Racist?" *The Batshit Weaponry Of The Middle Ages*. Accessed November 13, 2018.

To further understand why semantics and the meaning of words, in the context of AI carry a significant influence on the overall algorithmic structure and ethics, it is interesting to look at another example of Google AI identifying a woman of colour as a gorilla in the Google photo categorization. Image labelling technology is a type of process that allows us to find our pictures under certain automatically assigned categories, such as “landscapes”, “people” or “food”. However the algorithms that recognize certain objects are also trained on data that need to be “clean” as per the industry’s jargon. According to the Guruduth Banavar, former Vice President and chief science officer of cognitive computing at IBM data labelling is currently the new blue-collar jobs of the tech industry.

Data labeling, will be the curation of data, where you take raw data and you clean it up and you have to kind of organize it for machines to ingest. If you look at any of the complicated analytical jobs we have today, 70% of that job is probably about the organizing and cleaning of data. I don't think people had something called data labelers in the past, I think of it as data engineering. We are hiring people that we were not hiring even five years ago. People who just sit down and label data. Without labeling, you cannot train a machine with a new task. Let's say you want to train a machine to recognize planes, and you have a million pictures, some of which have planes, some of which don't have planes. You need somebody to first teach the computer which pictures have planes and which pictures don't have planes.⁵⁰ (Banavar quoted by Reese, 2016)

In 2015, a user noticed that his friend’s photos were in fact showing under the category “Gorillas” and reported it to the company via his twitter account which allowed the subject to be featured in international press and spark a conversation about racism in data. The online magazine Verge reported that the company’s representative appointed responsibility to the image labeling technology which is “nowhere near perfect” and since the incident the company has attempted to fix the miscategorisation by completely removing the categories that refer to animals such as gorillas, chimpanzees or monkeys (Vincent, 2018).

⁵⁰Reese, Hope. “Is 'data labeling' the new blue-collar job of the AI era?” TechRepublic. Published on Mar 10, 2016. Accessed on Mar 11, 2019.
<https://www.techrepublic.com/article/is-data-labeling-the-new-blue-collar-job-of-the-ai-era/>

In a real life simile, choosing data to train an algorithm is like choosing the curriculum for a child's education. If a child points to a fox and calls it a cat then it has properly identified that it is an animal but has mistaken the name of the animal. After seeing a fox many times, the child will be able to identify it correctly based on accurate data labeling. Labelling big data is a critical part of the Machine Learning process as previously mentioned and therefore no AI can ever function should there be a sufficient amount of information, already categorized and labelled for the system to “learn” from. In the Google AI & Machine Learning Products Store, one can find Human labeling services up for sale or the contacts for “Labeling partners” and it describes it as a process that “enables you to label images in your training dataset at scale. Well-labeled content results in better training data, which results in more accurate predictions from your model” (Google AI & Machine Learning Products Store, n.d.).

Similarly to any other function or operation, the material used defines the quality of the end result and in Machine Learning in particular, the ability of the algorithm to take “decisions” highly relies on the input that is has been provided with, the impact of its author. AI in any application, just like an artwork, is porter of its creators ideas, cultural influences and perception of the world, since the creator along will select a certain range of data over another, the type of information that should or should not be included to train the model and eventually the interpretation of what each data set would represent for the agnostic machine. Due to the risk of hidden bias in data that is used to train Machine Learning models in all fields, more and more researchers focus on the human implicit prejudices and how they can be hidden within the software we eventually all use.

Since the identity behind AI is usually presented under a brand’s name or as an abstract concept in a digital economy, discussing Machine Learning in particular can further complicate the overall identification of an individual or group of individuals as it refers to a continuous process of the algorithms education. Perhaps an interesting example of how Machine learning works already in our lives and how we also participate in its further development, is the predictive text

function of our phones which attempts to assume what we will write in a next message after already trained in our own writing pattern. What seems rather insignificant in the moment we witness it happening, consists of a pre-established base of the way the software understands a specific “style” which further improves based on our own particular style of writing, the use of diminutives names for our friends and family or oftenly used adjectives. The AI then, based on the data we provide - our usual writing pattern behaviour - attempts to replicate a virtual us which will then try to predict how we would express our thoughts. Therefore, it becomes clear that each person would use words in a different way based on their own personal perception, education and culture. An easy proof of how one’s implicit judgements in word choice can be relevant to data labeling can be seen in the Implicit Association Test (IAT) of Harvard University which allows one to quickly categorize words under good or bad. Malcolm Gladwell discusses the test in his book “Blink, The Power of Thinking Without Thinking” as follows:

The disturbing thing about the test is that it shows that our unconscious attitudes may be utterly incompatible with our stated conscious values. As it turns out, for example, of the fifty thousand African Americans who have taken the Race IAT so far, about half of them, like me, have stronger associations with whites than with blacks. How could we not? We live in North America, where we are surrounded every day by cultural messages linking white with good. “You don’t choose to make positive associations with the dominant group,” says Mahzarin Banaji, who teaches psychology at Harvard University and is one of the leaders in IAT research. “But you are required to. All around you, that group is being paired with good things. You open the newspaper and you turn on the television, and you can’t escape it.”⁵¹ (Gladwell, 2005:31)

Therefore, if our contemporary views are impacted by the popular culture massively diffused and those *thin-slicing* perceptions are respectively influencing data tagging - which becomes the generative educational power behind ML - then, as Adorno and Horkheimer extensively

⁵¹ Gladwell, Malcolm. *Blink, The Power of Thinking Without Thinking*. 2005. p. 31

discussed there is a considerable transformation on the impact of those conditions on the words we use and their respective *functions*:

The demythologizing of language, as an element of the total process of enlightenment, reverts to magic. In magic word and content were at once different from each other and indissolubly linked. Concepts like melancholy, history, indeed, life, were apprehended in the word which both set them apart and preserved them. Its particular form constituted and reflected them at the same time.[...] As a result, the word, which henceforth is allowed only to designate something and not to mean it, becomes so fixated on the object that it hardens to a formula. This affects language and subject matter equally.⁵² (Adorno and Horkheimer, 2002. p.133)

Accordingly, if the Artificial Intelligence algorithms that are already very present in our lives rely on the accurate data tagging to reproduce a real-life like result, but simultaneously they hide behind so many different layers of unexamined authorship, how can we say that an AI artwork has no author? Indeed, the AI complexity and its use as a means of production by an artist automatically mean that we are not solely looking at a single author and his personal intentions and influences, but a hidden layer of more collective authors whose contribution to the algorithmic design or training will eventually impact the “authors” work too.

It is also interesting to look at the statements of Elon Musk, regarding Artificial Intelligence integrations in our daily lives as discussed during a coding conference in 2016. The technology entrepreneur highlights the importance of advancement in AI and how the continuous evolution of AI could eventually become a further layer that would be integrated in our brains to make us smarter and more capable.

Your phone is already an extension of you. You’re already a cyborg. Most people don’t realize they’re already a cyborg. That phone is an extension of yourself. It’s just that the data rate, the

⁵² Horkheimer, Max, Theodor W. Adorno, and Gunzelin Schmid Noerr. Dialectic of Enlightenment: Philosophical Fragments. Stanford, CA: Stanford Univ. Press. 2002

communication rate between you and the cybernet extension of yourself that is your phone and your computer is slow. It's very slow. And that...it's like a tiny scroll of information flow between your biological self and your digital self. And we need to make that tiny scroll like a giant river. A huge high bandwidth interface. It's an interface problem. Data rate problem. We solve the data rate problem then I think we can hang on to human-machine symbiosis through the longterm. Then people may decide if they want to retain their biological self or not. I think they'll probably decide they want to retain their biological self.⁵³ (Musk transcribed by Pilkington, 2018)

Eventually, the Artificial Intelligence - which will never individually evolve like a human, with a system of ethics and experiences moderating its views - along with Big Data and unsupervised data tagging, create an unchangeable system, comprised by the implicit biases of invisible stakeholders, which becomes available to everyone and on which anyone can base their own work. Therefore, the subject of the responsibility of the "author", either of the code or the data tagging, although presented as insignificant, becomes highly relevant.

Moreover, discussing the use of Artificial Intelligence for art production in particular, requires us to consider how a collective of different stakeholders, that could be artists, engineers or data curators eventually influence the way the AI will function. Another aspect that should be taken into consideration when authorship is investigated in its AI art application, is to inevitably review separately abstract authorship cases such as the French group Obvious who use AI created by someone else, with data curated by unknown participants to artists like Mario Klingemann who create works under a clear identity as both the artist and the software engineer behind the works. The reason is not just to identify the artist but also the context that can be used to further appreciate the artwork.

Usually presented as a project, the conceptual demonstration of an algorithms painting or music composition skills, secure to the stakeholders involved a certain anonymity that is not necessarily investigated, allowing perhaps the spectator to focus on the art instead of the artist. Indeed, one

⁵³ Pilkington, Geoff, "You're Already A Cyborg." Medium. September 25, 2018. Accessed March 13, 2019. <https://medium.com/the-mission/youre-already-a-cyborg-b95ead28f1be>.

of the main arguments as presented by Barthes for the re-conceptualisation of the role of the artist was on the basis that the author's personal biography or a concoction of his previous works can influence our overall appreciation of the final result.

The image of literature to be found in ordinary culture is tyrannically centred on the author, his person, his life, his tastes, his passions, while criticism still consists for the most part in saying that Baudelaire's work is the failure of Baudelaire the man, Van Gogh's his madness, Tchaikovsky's his vice. The explanation of a work is always sought in the man or woman who produced it, as if it were always in the end, through the more or less transparent allegory of the fiction, the voice of a single person, the author 'confiding' in us.⁵⁴ (Barthes, 1977. p.143)

Based on perhaps similar arguments or socio-political reasons, there have been artists before who preferred to create their works under pseudonyms and hide their real identity like abstract-expressionist painter Grace Hartigan who signed some of her paintings under the name George Hartigan. Her obituary at the Guardian reads, "Feminist cultural theory holds that women, including Pollock's highly talented wife Lee Krasner, felt excluded by the maleness of the movement. At one point Hartigan decided to sign her paintings George (in homage to the female Georges, Sand and Eliot)." (Mintcheva, 2018). Lee Krasner, although mainly known as Jackson Pollocks wife, would also sign her works with her initials, instead of a full name. Withal, other artists like street artist Banksy or the activist female group Guerrilla Girls have resorted to aliases and hiding their real faces in order for the spectator to have an undistracted focus on the meaning of their work.

Since their inception in 1984 the Guerrilla Girls have been working to expose sexual and racial discrimination in the art world, particularly in New York, and in the wider cultural arena. The group's members protect their identities by wearing gorilla masks in public and by assuming pseudonyms taken from such deceased famous female figures as the writer Gertrude Stein (1874-1946) and the artist Frida Kahlo (1907-54).⁵⁵ (Tate, n.d.)

⁵⁴ Barthes, Roland, and Stephen Heath. *Image, Music, Text. The Death of the Author*, 1977 London: Fontana Press, Harper Collins Publishers, 2010.

⁵⁵ Tate. "'Guerrilla Girls' Code Of Ethics For Art Museums", Guerrilla Girls, 1990." Tate. Accessed April 09, 2019.

Throughout history however, looking into some of the established artists work, their identity is so inextricably linked to their work that it is impossible to ignore for an overall appreciation of the final result. The example of Mexican painter Frida Kahlo is one of the cases where the artist's personal life would be strongly linked to their work. Her intimate relationships including her marriage to painter Diego Rivera or her deteriorating health served as her primary source of inspiration but were also the main subject of representation in her paintings as a direct reference to her feelings.

Kahlo's contemporaries didn't know what to do with this art, so implacably frank. André Breton called it Surrealism, but Kahlo rejected the term. My painting is real, she said; it's me, it's my life. It was only in the 1960s and afterward, with the rise of feminism, gay rights and identity politics, that her work began to make sense. And then it made explosive sense: an artist who had been bending genders, blending ethnicities, making the personal political and revolutionizing the concept of "beautiful" generations earlier.⁵⁶ (Cotter, 2008)

Similarly, in cases of political criticism the artist's identity becomes more of a symbol for their cause and does not impact the aesthetic "beauty" of the work of art or its impact - perhaps even reinforces it-. "As she said, she was her art. But her subjectivity was capacious and empathetic. [...] I would suggest that biographical detail is just the beginning for understanding Kahlo's work. It is an art much bigger than the life that made it." (Cotter, 2008). Empathy is perhaps a keyword as this is one of the elements which are challenging to easily trace in Machine Learning artworks. In their paper "Motion, emotion and empathy in esthetic experience" (2007) David Freedberg and Vittorio Gallese discuss how our brain neurons are in fact responding to art in the same way as we would respond to a real life incident. Our perception of the existence of an author is more important to our appreciation of the final work as it allows us to identify perhaps in a way with the creator, perhaps examine her or his state of mind when creating the work.

⁵⁶ Cotter, Holland. "The People's Artist, Herself a Work of Art" The New York Times. Published Feb. 29, 2008. Accessed Mar 12, 2019.

Automatic empathetic responses constitute a basic level of response to images and to works of art. Underlying such responses is the process of embodied simulation that enables the direct experiential understanding of the intentional and emotional contents of images. This basic level of reaction to images becomes essential to any understanding of their effectiveness as art. Historical and cultural or contextual factors do not contradict the importance of considering the neural processes that arise in the empathetic understanding of visual works of art.⁵⁷ (Freedberg and Gallese, 2007. p.202)

In the case of AI, however, the challenge is not solely the lack of an identity to frame the work with or a deeper meaning but the fact that in cases of its complete eradication (like the Belamy family portraits), it forces us to reside in a purely “aesthetic” and instinctive interpretation of the final result. And should the aesthetics be the only means to evaluate an artwork then we would be perhaps looking into theories that surrounded the “what is beautiful?” question as it was defined by Aristotle or in the Kantian view of usefulness. Immanuel Kant, one of the most influential Enlightenment thinkers, asserted that in order for us to experience beauty we need to use our logic first as we will primarily evaluate the object and then allow ourselves to feel pleasure. Our personal judgment then is “merely subjective (aesthetic) judging of the object... precedes the pleasure and is the ground of this pleasure” (Ginsborg, 2011, p.4). Ginsborg further explains:

Kant puts it: “Our judgment on whether a dress, a house or a flower is beautiful is something we do not allow ourselves to be talked out of by any reasons or principles. We insist on subjecting the object to our own eyes, just as if our liking depended on sensation” (§8, 215-16). Nor can we judge an object to be beautiful on the basis of others opinions or responses: “the approval of others does not give a valid proof for judging beauty... what has pleased others cannot serve as the ground of a judgment of beauty” (§33, 284). Kant denies, accordingly, that judgments of beauty are “objective and cognitive judgments” (§18, 237), making clear that they are contrasted

⁵⁷ Freedberg, David. and Gallese, Vittorio. “Motion, emotion and empathy in esthetic experience” *TRENDS in Cognitive Sciences* Vol.11 No.5 p. 202, 2007 Elsevier Ltd. Accessed Jun 30, 2018, doi:10.1016/j.tics.2007.02.003

in this respect not only with judgments ascribing primary qualities, but also with secondary quality judgments and judgments of goodness or perfection.⁵⁸ (Ginsborg, 2011. p. 4-5)

However, the modern Arts Market, is arguably focusing less on the subjective notion of taste and more in a clear establishment of an artist as worthy through the lense of Art history, which inevitably includes the particular identity as built consistently through academic literature, the overall impact and critical review of their work by the “experts” of the field.

Regarding the recent immersion of AI in the Arts market, art business reporter Tim Schneider comments that the authorship on an artwork “determines the piece’s social capital, prestige level, and likely resale price, if not also its craftsmanship level and aesthetic depth. And those factors are what art collecting is all about” (Schneider, 2018). What is meant by that is that the identity of an artist, could make a great difference when discussing the monetary value of art in the modern day arts market. As an example, we could take the case of the Rubens painting “Massacre of the Innocents”(1611), which was incorrectly attributed to one of Ruben’s students until it was properly identified in 2002 and sold for the then record price of £49.5 million ("Rubens Fetches Record £49.5m.", 2002). The mastery of the techniques applied to the painting remained the same but the proper allocation of signature, made indeed a massive impact on the artwork’s price. The online magazine Rhap.so.dy in Words explains:

“Once the Massacre of the Innocents had been attributed to an Old Master its perceived value increased exponentially. It was the most expensive painting ever sold in the UK and Europe when the hammer crashed down with the winning bid at a thrilling Sotheby’s auction in 2002.”⁵⁹ (Ginnyburges, 2017)

The Massacre of the Innocents is not the only work to have had such a price increase by revealing its proper artist but it allows us to better apprehend what can the impact of identity on

⁵⁸ Ginsborg, Hannah. *The pleasure of judgment: Kant and the possibility of taste*. Published to Oxford Scholarship Online: Mar 2015 Accessed Mar 12, 2019 DOI:10.1093/acprof:oso/9780199547975.003.0006

⁵⁹ Ginnyburges, "What's in a Painting? Taking a Closer Look at Peter Paul Rubens' Masterpiece: Massacre of the Innocents (c. 1611-12)." Rhap.so.dy in Words. March 17, 2017. Accessed March 13, 2019.

an artworks collectability. This raises the question of how AI artworks eventually “fit” the competitive market commodification criteria that involve not simply the collector’s love of art, but also the prestige and approval among peers.

Undoubtedly, identity, responsibility and context finally allow for a complete evaluation of an artwork’s authorship question and in line with the established theories on authorship as discussed in this part, allow us to look into this research with a critical eye that should facilitate conclusion making towards the answer of who is the Author in AI artworks.

3. Computational Creativity

3.1 A learning journey of artificial Appropriation

Discussing authorship of AI artworks without discussing the concept of appropriation is quite challenging if we wish to remain relevant to the larger purpose of this research and especially since appropriation is the generative force behind Artificial Intelligence through the direct and indirect use of the databases used to train it.

It could be argued that all artists make allusions to their influences, experiences and aesthetic references through their work making implicit appropriation perhaps an inevitable step to art creation overall. Going back to antiquity, both Aristotle and Plato discussed art as “mimesis”, meaning the act of imitation of the images we see around us, whether those images and scenes were accurate representations of the truth or not.

Then consider this very point: What does painting do in each case? Does it imitate that which is as it is, or does it imitate that which appears as it appears? Is it an imitation of appearances or of truth? - Of appearances - Then imitation is far removed from the truth, for it touches only a small part of each thing and a part that is itself only an image. And that, it seems, is why it can produce everything.⁶⁰ (Plato, Republic/Book X, 380 BC, p. 598)

Since then, many artists have used existing imagery and other artists works as inspiration or the basis for the application of their own unique style. Indeed, well before Deep Dream’s psychedelic patterns could filter any picture, Picasso was painting *Las Meninas* (1957) as a new representation of the homonymous painting by Diego Velazquez painted in 1656.

The art world has formally acknowledged appropriation as an artistic form, from the Dada movement in the early 20th century and the readymades of Marcel Duchamp, to Surrealism and Pop Art. Duchamp (1887-1968) introduced the idea that any ordinary object could serve as art should the artist proclaim so (we will look into his conceptual work in comparison to “The

⁶⁰ Plato. Complete Works. (380 BC) Edited by John M. Cooper. Indianapolis, Cambridge: Hackett Publishing Company, 1997. p.598

Belamy” family portraits presented in chapter five). Overall, appropriation artists “believe that in borrowing existing imagery or elements of imagery, they are re-contextualising or appropriating the original imagery, allowing the viewer to renegotiate the meaning of the original in a different, more relevant, or more current context.” (Rowe, 2011, p.1). Andy Warhol’s Campbell’s Soup Cans (1962) are perhaps one of the most popular artworks to appropriate an everyday object like a can and turn it into art. Along with other artists of the Pop-art movement, openly appropriated objects, artworks or media as a new form of creativity, that introduced neo-conceptualism in Contemporary Art.

Consequently, appropriation has been widely discussed in art theory, especially how the re-conceptualization of objects, paintings (like the example of Mary Beth Edelson discussed previously) or any sort of culture product, can become original material under a new artist lens and method. Nevertheless, Sherri Irvin accurately remarked, that the establishment of appropriation as an act of originality can not be limitless for the appropriating artist either:

But the acceptance of appropriation art and other forgery-vulnerable art forms by the art world suggests that innovation, at least at the level of the individual artwork, cannot be what makes the difference between the artist and the forger with respect to authorship of their work. Perhaps when Sturtevant produced her first radical appropriation work, a substantial innovative leap was made. But Levine is (at best) the second appropriation artist, not the first; and by the time she has appropriated ten or twelve Walker Evans photographs, there seems to be no warrant for saying that further Evans appropriations are innovative.⁶¹ (Irvin, 2005, p.137)

Indeed, thinking of appropriation might bring to our minds references to the use of daily objects in unconventional applications such as Dali’s surrealist “Lobster Telephone” (1936) or cases when artists simply appropriated popular culture products in their own work as Dara Birnbaum’s “Technology/Transformation: Wonder Woman” (1978–79). Birnbaum’s video art piece was a

⁶¹ Irvin, S. “Appropriation and Authorship in Contemporary Art.” *The British Journal of Aesthetics* 45, no. 2 (2005): 123–37. doi:10.1093/AESTHJ/AYI015.

loop of original shots taken from the homonymous American CBS TV show which aimed to critique television as a mass-culture medium and the female representation in it.

“Opening with a prolonged salvo of fiery explosions accompanied by the warning cry of a siren, Technology/Transformation: Wonder Woman is supercharged, action-packed, and visually riveting. [...]throughout its nearly six minutes we see several scenes featuring the main character Diana Prince[...] in which she transforms into the famed superhero.”⁶² (Demos, 2010, p.1)

Birnbaum’s digital appropriation art was part of a movement in the seventies which included works by other artists like Jack Goldstein replaying in a loop MGM’s roaring lion in “Metro Goldwyn Mayer” (1975). The latter was part of the group exhibition “Pictures”⁶³ (1977) for which the curator wrote:

If it had been characteristic of the formal descriptions of modernings art that they were topographical, that they mapped the surfaces of artworks in order to determine their structures, then it has now become necessary to think of description as a stratigraphic activity. Those processes of quotation, excerptation, framing, and staging that constitute the strategies of the work I have been discussing necessitate uncovering strata of representation. Needless to say, we are not in search of sources or origins, but of structures of signification: underneath each picture there is another picture.⁶⁴ (Crimp, 1979, p.87)

Taking into account that stratigraphic reference by Crimp, we can perhaps best picture what lies below any image produced with Machine Learning techniques just like the different layers in biostratigraphy. Artificial Intelligence as an art medium becomes the perfect manifestation of that by proving that producing a single output requires a significant amount of data as input. “The subject of computer science is the transformation of information, and data are its object. Data exist in streams; data flow is ephemeral, transient, shifting. Data is everywhere and

⁶² Demos, Thomas J. *Dara Birnbaum Technology/Transformation: Wonder Woman* Afterall Books / One Work, 2010, p.1

⁶³ "Pictures September 24 – October 29, 1977." Artists Space. Accessed March 17, 2019. <http://artistsspace.org/exhibitions/pictures>.

⁶⁴ Crimp, Douglas. "Pictures." October 8 (1979): 75-88. doi:10.2307/778227.

nowhere”(Ascott, 2007 p.224). For a real life artist, that “database” could be seen as her or his visual memories, Fine Arts education, the popular culture surrounding them or overall aesthetic entourage since childhood. For the algorithm however, as previously discussed, there needs to be a thorough selection of artworks that would train the algorithm to learn how to draw and how to match or exceed in the style presented.

In that way, the use of pre-existing artworks in AI creative practices becomes a prerequisite. What is meant by a prerequisite is simply that in AI art at its current form, the algorithm’s learning journey is based solely on specific data, and the artist does not directly control at all times which elements of the database will be used by the AI. As the algorithm lacks the memory, impulse and emotion to take a conscious artistic decision it will use the provided data in a random manner. AI could be considered therefore as an appropriating machine even when the artist is involved. As such, it becomes critical to examine the role of the practice of appropriation in AI and how it affects not only the authorship of the work but also the final interpretation of the artist’s intentions.

Assuming that a certain painting method requires a proper framework and context to be thoroughly understood or mastered and further, that history has demonstrated a great variety of painting styles, then one can argue that AI algorithms which are trained on significant ranges of artworks, will inevitably provide aesthetic results that fail to mimic the period. A good example for this is the Belamy family portraits which we will further discuss in Part II, created with GANs and aiming to draw in line with 18th century standards, without great aesthetic resemblance.

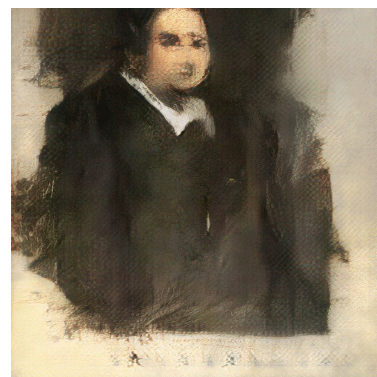


Fig. 9: Thomas Gainsborough
The Blue Boy (1770)
5' 10" x 3' 8"

Courtesy of Hunting Library, Art Collections, and Botanical Gardens

Fig. 10: Obvious
Edmond De Belamy (2018)
70 cm × 70 cm (27.5 in × 27.5 in)
Courtesy of Obvious Art Gallery

Should we further assume that aside from the obvious appropriation of works previously made by artists, the algorithm also hides in itself further implicit biases of a systemic structure that dictates what the function of the AI should be, what are its objectives (to imitate the human mind) and so on, we are brought back to the “Enlightenment as mass deception” arguments by Adorno and Horkheimer:

The might of industrial society is lodged in men’s minds. The entertainments manufacturers know that their products will be consumed with alertness even when the customer is distraught, for each of them is a model of the huge economic machinery which has always sustained the masses, whether at work or at leisure – which is akin to work. From every sound film and every broadcast program the social effect can be inferred which is exclusive to none but is shared by all alike.⁶⁵
(Adorno and Horkheimer, 1944. p.4)

Additionally, to better understand how appropriation is used in contemporary art and what AI can challenge by fitting into this particular field (if it were not perhaps to signify the beginning of a new one), we should also look into some of the artworks produced with the assistance of machine learning and how appropriation was key to their completion.

A Machine generated project utilising appropriation in a more straightforward manner is Simon Colton’s “Amelie’s Progress”, painted by The Painting Fool described by its creator as a “software that we hope will one day be taken seriously as a creative artist in its own right.” (Colton, 2012, p.3). In 2008 Colton used the artificial medium in a project which attempts to recreate still portraits from a movie through different painting styles. The painting fool generated 222 portraits of the actress Audrey Tautou in her role as Amelie in the French film “Le fabuleux destin d'Amélie Poulain”(2001). In a volume of paintings larger than many artists lifetime work,

⁶⁵ Horkheimer, Max, Theodor W. Adorno, and Gunzelin Schmid Noerr. *Dialectic of Enlightenment: Philosophical Fragments*. Stanford, CA: Stanford Univ. Press. 2002. p.4

Colton programmed the algorithm's choice of painting styles to match a database of pre-mapped emotions as perceived by Colton himself.

With the Amelie's Progress gallery, The Painting Fool was trained to appreciate how its painting styles can heighten the emotional content of a portrait. To do this, I developed an expert system to map keywords such as 'happy' or 'sad' onto painting styles (which include colour palettes, abstraction levels, natural media choices, etc). With the Imaginations #1 gallery, I'm expanding The Painting Fool's abilities to create and paint scenes from its imagination (inspired by Cohen's AARON program), for example by using evolutionary techniques.⁶⁶ (Colton, 2008)



Fig. 11 Simon Colton
Amelie's Progress (2008)
Still of Audrey Tautou in "Amelie" character
Courtesy of Amelie's Progress Gallery online



Fig. 12 Shepard Fairey
'Hope' (2008)
poster of the former US president Barack Obama
Courtesy of: Shepard Fairey/PR company handout

In Amelie's Progress we can identify the layers of appropriation, starting with the Painting Fool appropriating the information provided by Colton, and then appropriating the stills of the movie to present the actress in character under a new filter. The algorithms appropriation of the movie content could perhaps best be paralleled with Shepard Fairey's prominent "Hope" (2008) stencil poster (Fig.12), created the same year, which became the symbol of the Occupy movement. In both cases the artists, used a pre-existing image of a real person (in Amelie's case an actress in character), and recontextualised it under a new visual representation. In Fairey's case the colors were inspired by the American flag that references the feelings of hope for political change,

⁶⁶ Colton, Simon. "Amelie's Progress Discussion." The Painting Fool - Amelie's Progress Gallery - Discussion. Accessed March 17, 2019. http://www.thepaintingfool.com/galleries/amelies_progress/discussion.html.

whereas in Colton's portraits, the visual effects added by the machine, were largely based on his own interpretation of which style should match which emotion. In a way, both projects largely appropriate pre-existing imagery to accomplish their purpose, and in both cases the artist is the one deciding on which aspect of the work should be highlighted. Nevertheless, asking a machine to identify emotions based on visual patterns certainly allows for the final works to be presented as a different work than the one envisioned by Jean-Pierre Jeunet when realising the movie.

Overall, it becomes obvious that artists working with AI art, ultimately leverage appropriation as a means to test their medium's capacity but also in an attempt to create something original with an unfamiliar production tool. David Hare discussed originality in contemporary art by pointing out that "On an artist's originality depends his life as an artist. It is in the act of continuously overcoming this originality that he produces art." (Hare, 1964, p.139). Although originality and appropriation might seem contradictory, in this particular context, it can be included in an original art practice as the subject or object appropriated is done so through a novel medium. Either by the use of images as instruments for the machine learning process or as inspiration for the theme of the final work, appropriation is an inevitable part of AI made art and as such it can reinforce the artistic intentions by providing the ground for the work to be associated with art.

3.2 Artist VS engineer

Living in the most digital oriented era to date, with generations born in the last 20 years, being the future demographics that have never experienced the non-internet times, we remain still widely unschooled as to how the algorithms that power our daily digital routines function, what is their creators impact on our cultural evolution, our creativity and the shaping of future creative tools. It is an indisputable fact that most human intellectual products of our times will certainly rely either directly or indirectly in the use of a machine. In a way, we could argue that computers act as an assistance tool for creatives since their wide commercialisation, with writers using them as tools to spell-check a document, photographers or designers as a tool to edit create and adjust visual outcomes and artists integrating them in their practices.

To add to this, art made with the support of technology is anything but new. From Camera Obscura to photographic or video cameras and now computers, artists have been relying on their tools to improve the details and achieve the intended aesthetic result for their works. One of the first references on how machines and creativity are linked can be traced back to the visionary British mathematician Ada Lovelace, who happens to also be the first computer programmer almost 100 years before the first computer existed. “We may say most aptly that the Analytical Engine weaves algebraic patterns just as the Jacquard loom weaves flowers and leaves.” (Lovelace as quoted by Eveleth, 2012). However, the endless possibilities that a creative coding process can generate, do not impact the creator’s authorship, as Lovelace further clarified that the machine can not be creative on its own but it performs the task its creator will assign to it. Should we assume that she was referring to what we now call artificial intelligence, although the state of the art has largely evolved since, her ideas remain quite contemporary.

Swiss sculptor Jean Tinguely was perhaps among the first to present telekinetic installations in the exhibition “Homage to New York: A Self-Constructing and Self-Destroying Work of Art” that took place in MoMA in 1960. As per the exhibitions title, the Dada-inspired sculpture was designed to self-construct and self-destroy, appointing the performative role solely to the machine.

Bottles shattered, wheels spun, colored smoke plumed up into the air, and the machine's various metal components crashed and clinked atop a piano, creating an arrhythmic soundtrack. But when sparks escalated into flames, and a portion of the machine broke away, crashing into an NBC camera crew, a nervous firefighter intervened and doused the machine with water, sealing its fate.⁶⁷ (Wolff, 2011)

Tinguely's creation eventually failed its performance, but there was still no doubt about its authorship. As the machine sculpture was visibly inhuman, and did not show any sign of intelligence or creativity, it could not possibly be assumed that it was in any way independent, even if it were designed to self-destruct. Tinguely was clearly the artist in this equation, who envisioned and constructed the machine in an intelligent manner that allows it to construct or destruct itself as per his instructions. Which is perhaps what allows for Artificial Intelligence to raise to a different standard than the machines during the sixties, as its role along with that of the hybrid developer / artist remain largely abstract concepts.

In a similar spirit with the Tinguely machine performance, the Institute of Contemporary Arts (ICA) in London hosted its own "Cybernetic Serendipity" exhibition in 1968. Curated by Jasia Reichardt, the exhibition of cybernetic art included robots, computer graphics, films and music. As explained by the curator herself, some 50 years after, the exhibition owes its title to the element of unpredictable interactions the artworks could have with the audience, "happy chance discoveries with the computer" (*Cybernetic Serendipity*, 2014) as she called it. It could be argued that Reichardt's exhibition revolutionised the concept of machine-made artistic creation and authorship since the people involved were not necessarily coming from the art field. "Among the contributors to the exhibition there were forty-three composers, artists and poets, and eighty-seven engineers, doctors, computer systems designers and philosophers." (Reichardt, 1971.p.1).

⁶⁷ Wolff, Rachel. "Swiss Institute's 'Destruction' Pays Homage to Jean Tinguely." The New York Times. April 06, 2011. Accessed March 18, 2019.
<https://www.nytimes.com/2011/04/10/arts/design/swiss-institutes-destruction-pays-homage-to-jean-tinguely.html>.

The idea of an artwork made by an artist was therefore challenged and allows us to detect a relatedness to the concept of the “Social sculpture” as presented by artist Joseph Beuys in the early seventies. Beuys objected to the idea that art is solely produced by the designated individuals that we call artists and instead in his concept he saw the potential for art to be created through the public’s participation, in incubation within a social realm that can consequently transform society. “For Beuys, the concept was infused with both political intention and spiritual values. As spectators become participants he believed, the catalysis of social sculpture would lead to a transformation of society through the release of popular creativity.” (Moore, n.d.).

Creativity is not limited to people practicing one of the traditional forms of art, and even in the case of artists creativity is not confined to the exercise of their art. Each one of us has a creative potential which is hidden by competitiveness and success-aggression. To recognize, explore and develop this potential is the task of the school.⁶⁸ (Beuys transcribed by Schoene, 1979, p.292)



Fig. 13 Joseph Beuys talking to Richard Hamilton at Tate 1972
Photograph in black and white
Courtesy of © Tate 2005

The “Social Sculpture” and this potential for everyone to make art allows us to deduct from the Cybernetic Serendipity exhibition and the artworks presented at it, that although they may not have been intrinsically made by clearly identified artists they still fulfilled their role as a creative achievement or “approximate very closely to what we have learned to call art and put in our public galleries”. (Reichardt, 1971. p.1) Should we go back to the Foucauldian 'author function' we could identify that should we accept those works - made by engineers or doctors - as artistic

⁶⁸Schoene, Janneke. *Beuys' Hut: Performance und Autofiktion*, “Audioguide der Retrospektive 1979” p.292

creations we could fit the artist title along with that of the creator who is responsible for their completion.

Since the sixties and seventies, artists have increasingly utilised machines in their works and as technology became more powerful and production means “smarter”, we experienced a process of interaction between the artist and the medium that has facilitated and enhanced the creative process. Artist and theorist John McHale, as a futurist of his time, noticed the potential when in his 1969 book “The Future of the Future” he attempted to alert his audience about the future-making capacity of “now”.

[...] reacting more swiftly and intuitively to changes in his immediate environ, and beingless hampered by academic specialization and professional commitment, [the artist] has been more attuned to new forms and technological potentials of our period. If Dadaism, Surrealism, Constructivism, and their later variants have sensitized the contemporary vision to the metamorphosis of cultural values, often through a savage and corrosive irony, they have also provided a usable mythology of the machine and an insight into its creative potentialities.⁶⁹ (McHale, quoted by Basette, 2018, p.3)

Indeed the creative potential of the machine was demonstrated with AARON (1973-2016), a computer program, that could be considered perhaps the first machine “painter”, created by British artist Harold Cohen (1928-2016). Cohen was one of the pioneers in computer made art and a self-taught programmer who wrote a program which he then “taught” how to draw large paintings and he considered his alter-ego.

⁶⁹ Bessette, Juliette. "The Machine as Art (in the 20th Century):An Introduction." Research Gate. January 23, 2018. Accessed March 18, 2019.
https://www.researchgate.net/publication/322671758_The_Machine_as_Art_in_the_20th_Century_An_Introduction



Fig. 14 Harold Cohen coloring the forms produced by the AARON drawing “Turtle” at the Computer Museum, Boston, MA, ca. 1982.
Courtesy of the Collection of the Computer History Museum, 102627459.

Cohen wrote extensively about AARON, looking at the questions a computer-based artistic system raised both within the computing and art worlds. Was AARON creative? Cohen certainly thought that it was not as creative as he had been in creating the program. Who was the artist—Cohen or AARON? Cohen compared it to the relationship between Renaissance painters and their studio assistants. Was the fact that AARON created art works evidence of computer intelligence? On that, Cohen seemed non-committal, saying that AARON never worked to improve itself, a sure sign of intelligence, but at the same time defending the fact that AARON did just what human artists did, taking knowledge of forms and applying them to the creation process.⁷⁰ (Garcia, 2016)

Cohen once explained during an interview: “I write programs, programs make drawings, drawings made completely by the computer” (Harold Cohen - The Age of Intelligent Machines - 1987(Clip), 2016) but he further clarified that the program is not more creative than himself writing it and giving it instructions, allowing perhaps for a clear fusion of the artist’s role with that of the computer scientist. Moreover, Cohen’s instruction to the machine, resemble quite a bit

⁷⁰ Garcia, Chris. "Harold Cohen and AARON-A 40-Year Collaboration." Computer History Museum. August 23, 2016. Accessed March 17, 2019.

the instruction art guidelines of artists like Yoko Ono. Ono published in 1964 her book titled “Grapefruit” in which she included instructions for Do-It-Yourself paintings or performance art:

Rather than images of paintings, the publication offers instructions for paintings in which the paint and brush are often relegated to a secondary role. A number of these instructions were realized on the occasion of the artist’s first solo exhibition, at AG Gallery, New York, in July 1961 (p.58-67). At least three of them had already been enacted a few months earlier during the Chambers Street Loft Series, a run of performances and concerts held in Ono’s loft.⁷¹ (Cherix, 2015, p.16)

However, Cohen’s and other computer artists instructions have as sole receiver the machine instead of a human which makes the output less likely to produce something outside the instructions provided. As we will be further reviewing, there are certain cases where the algorithms trained and published could largely serve as a manual for anyone with an impulse to test it out.

Indeed, since AARON, more computer scientists and artists were inspired by Cohen’s work (e.g. Simon Colton previously mentioned) and have produced computer-made or Artificial Intelligence-made art. Despite the technological maturity of the field of computer science since then, the notion of an artist utilising the code and not the other way around is quite valuable to the purpose of this research. Cohen’s algorithm based on his view was a collaborator that assisted him in his artistic process, allowing for the programming skills to be considered equally creative as a painters brush use.

Regarding the coding-as-art argument, it was perhaps the founders of video game company Electronic Arts, commonly referred to as EA Games who first openly introduced the concept of “Software Artist”. In the early eighties, Trip Hawkins founded Electronic Arts along with

⁷¹ Biesenbach, Klaus, Christophe Cherix, Jon Hendricks, Clive Phillpot, and David Platzker. Yoko Ono: One Woman Show, 1960-1971. New York: Museum of Modern Art, 2015.

Richard Melmon, and Bill Budge and in a promotional video published back then they discussed their early vision of their big idea, the Software Artist.

Budge: I think being a software artist is trying to push the medium. [...] Hawkins: I think software is an art form and its becoming more and more artful all the time. We are starting to see the kind of people that are really good at doing great software behaving more and more like artists are traditionally expected to behave.⁷² (“Software Artist”, 2013)

Over the years there have been some supporters of the idea that video games should be considered an art form while in 2012, Museum of Modern Art of New York took a stand on the debate when it announced that it had purchased 14 classical video games. In their online announcement MoMA categorised the games in an exhibition titled “Applied Design” (2012) and Senior Curator Paola Antonelli discussed games as digital artifacts with an elegance of code:

Are video games art? They sure are, but they are also design, and a design approach is what we chose for this new foray into this universe. [...] Our criteria, therefore, emphasize not only the visual quality and aesthetic experience of each game, but also the many other aspects—from the elegance of the code to the design of the player’s behavior—that pertain to interaction design. In order to develop an even stronger curatorial stance, over the past year and a half we have sought the advice of scholars, digital conservation and legal experts, historians, and critics, all of whom helped us refine not only the criteria and the wish list, but also the issues of acquisition, display, and conservation of digital artifacts that are made even more complex by the games’ interactive nature.⁷³ (Antonelli, 2012)

The elegance of code statement of the curator, raises the valid question as to how one should perceive this type of admirable asset if not a programmer. Actually, as coding is not instructed the same way as reading and writing is (although arguably it eventually should), in order for anyone to appreciate or be able to evaluate a codeline’s style or develop a taste and preference for a certain writing style over another, they should have a thorough knowledge of programming.

⁷² “Software Artist” YouTube video 2:01 Published by Joe Kim on Jun 18, 2013, Accessed on March 20, 2019.

⁷³ Antonelli, Paola. “Video Games: 14 in the Collection, for Starters”, inside_out - A MoMA/MoMA PS1 Blog. Nov 29, 2012 https://www.moma.org/explore/inside_out/2012/11/29/video-games-14-in-the-collection-for-starters/

This gap of knowledge is perhaps what makes it harder for the greatest part of a museum's audience to perceive a certain beauty in the technique of coding, even if the visual result is more familiar and accessible than any other high-brow art piece. In a similar spirit, art critic Jack Burnham - perhaps one of the first theorists to discuss what he called *Systems Esthetics* (1968)- drew a parallel among artists and magicians

Perhaps the concept of progress, of progression from a less sophisticated to a more encompassing state, both materially and psychically, is a quality that can only be identified with art in a technologically dynamic culture, and then only because art ceases to be art in the traditional sense. It is difficult to ignore the common purposes of art and science, though less so when we consider that in prehistoric times the artist and the magician were both latent scientists.⁷⁴ (Burnham, 1968 p. 6)

For Burnham it was clear that we are transitioning from an “object-oriented to a systems-oriented culture” and thus it was especially important to look into “the way things are done” instead of the things themselves (Burnham, 1968 p. 1). However, Burnham's view was not shared among all critics. As a response to the MoMA exhibition, art critic Jonathan Jones wrote an article explaining why games can not be considered art and how this approach risks the “real understanding of art”. In his words the reason why the games can not be art is 1) because they lack human intention and inspiration and 2) because no one owns them, defining art in the sense of authorship, an idea highly relevant to this research.

Art may be made with a paintbrush or selected as a ready-made, but it has to be an act of personal imagination.[...] No one "owns" the game, so there is no artist, and therefore no work of art. This is the essential difference between games and art, and it precedes the digital age. Chess is a great game, but even the finest chess player in the world isn't an artist. She is a chess player. Any definition of art that robs it of this inner response by a human creator is a worthless definition.⁷⁵ (Jones, 2012)

⁷⁴ Burnham, Jack. *Beyond Modern Sculpture*, George Braziller, Inc. One Park Avenue New York, 1968 p.6

⁷⁵ Jones, Jonathan “Sorry MoMA, video games are not art”, The Guardian, 30 Nov 2012 16.17 GMT First published on Nov 30, 2012 Accessed March 20, 2019
<https://www.theguardian.com/artanddesign/jonathanjonesblog/2012/nov/30/moma-video-games-art>

Jones interpretation of the artfulness of the digital medium related directly to its author's personal "reaction to life" makes it a valid conclusion that perhaps his dismissal comes from the lack of understanding of the humans contribution to the final design and function of a video game. Also, it makes the software developers who perhaps conceptualised the design, characters, plot and functions of the game fully appropriated by the corporation that employs them, allowing therefore for their identity to be completely disregarded as of no importance.

In a similar fashion as MoMA, The Barbican Centre in London in collaboration with Google Developers, launched in 2014 a call for artists who work with code, which resulted in an art exhibition called DevArt. The Barbican described it as "An immersive exhibition of art, design, film, music and video games." ("Digital Revolution." n.d). Looking into this exhibition, Barbican discusses not only the present of digital arts but also expands the stereotypical views on what we contemplate as an artist's tool "and considers the impact of creative coding, DIY and maker-culture, digital communities and the creative possibilities offered by augmented reality, artificial intelligence, wearable technologies and 3D printing."(online brochure, Barbican, Digital Revolution, n.d).

The Barbican has since hosted more AI-themed exhibitions with the latest one titled "AI: More than Human" which in the same spirit as the "Digital Revolution" attempts to further discuss the machine integration in creative applications while allowing artists who work with code to exhibit their works. "Bringing together artists, scientists and researchers, this interactive exhibition offers an unprecedented survey of AI with which you are invited to engage head-on." (online brochure, Barbican, AI: More than Human, n.d). In the same line with the Cybernetic Serendipity, both exhibitions do not aim to simply exhibit "artists" but also computer science researchers and engineers, democratising further the pre-established institutional access.

There are various reasons that could be identified as the source for the promotion of AI as a creative tool but it would be impossible to not pinpoint among them the influence of the

increased accessibility to the technological tools and learning resources. The age of the internet has revolutionised learning with numerous online sources allowing anyone to learn more about development, computer science and coding. Making the creative process interdisciplinary and allowing access to people who would previously need to complete years of computer studies. As the vast majority of the current generations of art critics and curators come from a very specific background which did not necessarily allow for the access to the same technological tools as the next generations - who will get more contact with the digital evolution of production tools from early on - we might experience in the next decade a radical redefinition of museum-worthy artworks as well as the application of the word artist.

To further investigate the stereotypes in artist roles and subjects we could be looking into the collaborative AI art performance *My Artificial Muse* (2017) presented by artists Mario Klingemann and Albert Barqué-Duran. The performance was intended to create a “Mural/Fresco Painting designed by an Artificial Neural Network” (Quasimondo, n.d.). First presented during the Sónar Music Festival in Barcelona in 2017, *My Artificial Muse* attempted to invert the role of the machine as the executive body and instead Barqué-Duran was to produce a large mural oil-painting modeled after an image provided by the Neural Networks algorithm. In the aftermovie of the project, Barqué-Duran explains how he produces a unique oil painting during each three-day performance modeled after an AI generated image which is different every time. The muse picture is generated by the algorithm based on a pre-selected posture inspired by historical paintings of muses like in John Everett Millais’s *Ophelia* (1852). After providing the machine with an over-simplified body posture line drawing, the AI will then generate an image around it for the painter to copy (*My Artificial Muse – THE AFTERMOVIE (Sónar+D 2017)*, 2017). Klingemann, as the programmer and artist, designed the AI algorithm to improvise.

Can a Muse be “artificial”? Do they need to be “physical”? Can a computer-generated Muse be as inspirational as a human-like one? By destroying the classic concept of a Muse, are we creating something better? Imagine the most simplified and abstract version of a Muse: a stick figure. Now give this “Artificial Muse” (in a specific or random posture) to a learning machine. Is this machine creative enough to produce a painting from such a simple input? Yes, indeed. An

Artificial Neural Network designed in a collaboration between me and Albert Barqué-Duran uses what I call a “pose-to-image approach” to produce its own amazing artwork.⁷⁶ (Klingemann, 2017)

When reviewing the creation process, it becomes obvious that both artists contribute significantly to the final result while the algorithm also provides the final visual model of what it produced around the data. There is no doubt that Klingemann’s intention as the artist and creator of the algorithm has impacted the way the program functions, but the algorithm itself becomes an integral part of the process as it generates a unique image that neither Klingemann nor Barqué-Duran have ever seen before. Eventually, the artificial muse serves as the model for Barqué-Duran, taking us back to the times when painters would draw still-life. Nevertheless, although the Spanish artist holds the brush, the algorithm and its creator deserve recognition for an equally artistic contribution to the final result.

In one of his interviews, Klingemann discussed his unconventional artist path in the field of generative art, by explaining that his talent is with code and therefore prefers to draw using code instead of a brush. In his reasoning, it becomes clear that his objective is to be surprised by the visual outcomes of the machine to which he largely contributes while eventually he learned to call himself an artist (“Moving Ideas.arts - Mario Klingemann - Part 01 of 03”, 2018).

Finally, reviewing the previously mentioned artworks made with the support of a computer or in particular Deep Learning, allows us to reflect on the evolution of art production tools. In all cases, imaginative individuals found a way to express their intentions through the use of available mediums, whether that was a paint brush, a mechanical structure or a line of code. Should we be examining art through the experience of what we have already been told to look at as art, or is there space for creativity and art production outside the pre-assigned roles? Undoubtedly, the rapid technological evolution will provide the answer and perhaps open the arts field towards a collaborative fusion with other disciplines and the tools they carry with them.

⁷⁶ "Mario Klingemann, Artist Working with Code, AI and Data." Quasimondo. Accessed March 17, 2019. <http://quasimondo.com/>.

Part II - A critical review of AI produced artifacts

4. “The Next Rembrandt” - a project created by AI

4.1 A brief history of Corporate patronage

Although artists have been using algorithmic art in their projects since the ‘50s as discussed in Part I, with the birth and further development of Machine Learning (ML) in all fields, Big Data paved the way for new applications of the algorithms. This generated increased interest from corporations, which usually would not associate tech with cultural projects.

Taking inspiration from the newest developments in the field of Artificial Intelligence, corporations looked for new potentialities in culture and the arts using technology, including attempting to use data and code to bring back to life the works of *Grands Maîtres*, such as Rembrandt or Van Gogh, in an artificial way. This chapter will discuss a case study reviewing what happens when a machine powered by a corporation tries to imitate fine art, as well as authority issues, such as who can be said to be the author of such work. The project “The Next Rembrandt” was sponsored by the Dutch bank ING and brought together a collective of researchers, IT and art specialists in order to produce a unique new painting by Rembrandt through the use of technology.

In appearance, the initiative seems well-thought and original and does not seem to be relatable to the overall ING business sector which is financial services and not the arts and culture. However, should we look closer, the project consists of an intelligent cultural diplomacy tactic which further accentuates the bank’s national image linked to the Dutch heritage and culture. Eventually, ING acts as a patron for the creation of a novel work of art by a very loved and acknowledged Dutch artist while does not take directly credit for its creation and instead leverages Artificial Intelligence as the novel artist in works.

The concept of patronage is not new in the art world. From Mesopotamia and Ancient Greece to the Renaissance and the modern world, wealthy individuals, royals or clerics had been acting as

unofficial or official benefactors of artists in order to actualise their artistic visions. In fact, patrons were considered more than just the financiers of artworks, works created prior to the Renaissance period were often presented under the name of the patron, instead of that of the artist.

This system changed significantly over recent centuries, and artists are no longer viewed as manufacturers and realizers of the grand ideas of powerful patrons with the knowledge and means to commission art (Mann, 2016). Artists have since established their creative freedom to produce art on their own and sell it as such, but many public artworks are still commissioned by public or private entities. With the evolution of technology, our exposure to the internet and a prevailing capitalist system, images and art can still be the perfect signifiers for big corporates to transform art into a bourgeois and capitalist commodity, as discussed by Roland Barthes in his essays *Mythologies* (1957). By using everyday examples like that of wine or cars, Barthes highlights the myth we build around the products that surround us, much like the myth built around artificial Intelligence.

The mythology of wine can in fact help us to understand the usual ambiguity of our daily life. For it is true that wine is a good and fine substance, but it is no less true that its production is deeply involved in French capitalism, whether it is that of the private distillers or that of the big settlers in Algeria who impose on the Muslims, on the very land of which they have been dispossessed, a crop of which they have no need, while they lack even bread. There are thus very engaging myths which are however not innocent. And the characteristic of our current alienation is precisely that wine cannot be an unalloyedly blissful substance, except if we wrongfully forget that it is also the product of an expropriation.⁷⁷ (Barthes, 1972 p.61)

By using the case of wine, Barthes attempts to present the product's provenance as a complex ideological myth which could be further paralleled to the myth of Artificial Intelligence as a powerful product of the technology industry which comes to revolutionise and facilitate our lives while already fully integrated in our daily routines. The IT companies which are in charge of this

⁷⁷ Barthes, Roland. *Mythologies*. 1957. New York: Noonday Press, 1972. p. 88

rapid and radical development are also the lead institutions of the newest form of a new digital capitalism which engages in extensive cultural diplomacy practices to strengthen its public image. Corporations design and sell - or generously offer for free - software which has become indispensable to our living while we remain largely unaware of who made them and what was their intention. Barthes further myth deconstruction mentions the concept of anonymity in reference to a Gothic cathedral metaphor: "I mean the supreme creation of an era, conceived with passion by unknown artists, and consumed in image if not in usage by a whole population which appropriates them as a purely magical object." (Barthes, 1972 p.88) Much like the Gothic cathedral, the case study to be reviewed is wrapped in the same anonymity mystery.

Before going into the details of the project The Next Rembrandt (2016), it is essential to consider some of the cultural diplomacy initiatives that preceded it, to better understand the motives behind its commission. To begin with, we could assume that Google was the first international corporate of the 21st century to initiate a 'technology-meets-culture' tendency when they founded the Google Cultural Institute, initially called the Google Art Project. "The project was launched on February 2011, in cooperation with 17 international museums at the time, including the Tate Gallery, London; the Metropolitan Museum of Art, New York City; and the Uffizi, Florence" (Waters, 2011).

Even though it was not primarily designed to create art, the project has grown from a virtual museum tour tool to a non-profit foundation that partners with the most prestigious museums and cultural organisations in the world to provide global access to art all over the world. Additionally, the project creates free tools powered by AI for virtual storytelling. One of those tools is the much-discussed through popular media 'art selfie', which is powered by AI and matches the user's facial features with those in known artworks as "a playful way to discover art [...] and search thousands of artworks to see if any look like you"(Art Selfie - a playful way to discover art by Google Arts & Culture, 2018). It is worth noting that 'Art selfie' is a free tool, available globally through the Google Arts and Culture Application to anyone with a

smartphone, in line with the “commodification of culture” arguments discussed by Adorno and Horkheimer in Part I.

Going back to the company’s collaboration with the Barbican Art Centre in London, as mentioned in Part I, Google launched DevArt, a global competition for artists who use coding to generate their works. Here are two definitions of the initiative as published directly by the company:

- 1) “DevArt is a celebration of art made with code by artists that push the possibilities of creativity - where technology is their canvas and code is their raw material.”
- 2) “DevArt is art made with code, by developers that push the possibilities of creativity and technology. They use technology as the canvas and code as the raw materials to create innovative, engaging digital art installations. DevArt is the opportunity to open their creative process, share their art with the world and be a part of a new movement in art.”⁷⁸ (DevArt, n.d.)

A significant and potentially confusing difference between the two, is the explicitly presented authorship. In the first case, authorship is allocated to the artists, while in the second case authorship lies with the developers. These definitions, which act as a manifesto for the art of coding quest, recommend the use of technology as a new medium to produce and diffuse art. It creates the assumption that the company is attempting to take a theoretical stand on a new computational movement in art, even if the artists are not clearly defined.

Following Google’s initiative, another technology giant launched a similar project, including exhibitions that are co-created by artists and computer scientists using ML, as part of its Research’s Artist in Residence (AIR) program. Microsoft “seeks to build collaborations between researchers, engineers, and artists/designers to create beautiful and innovative experiences that inspire new ways of thinking about existing and future scientific challenges.” (AIR, 2018). In this instance, the identity of the author/artist is quite clear. For instance, a series of artworks that is presented in the platform titled *The skies epitomized* (2015), a project listed as “created in

⁷⁸ “About” DevArt, n.d. Google. Accessed May 23, 2018 <https://devart.withgoogle.com/#/about>

collaboration between Maja Petrić, an artist, and Nebojša Jojić, a machine learning researcher (AIR, 2015)”, which was exhibited in December 2015. Overall, both initiatives could be strongly linked to the concept of posthegemony as discussed by Yúdice:

Flexible accumulation, consumer culture, and the "new world information order" are produced or distributed (made to flow) globally, to occupy the space of the nation, but are no longer "motivated" by any essential connections to a state, as embodied, for example, in a "national-popular" formation. Their motivations are both infra- and supranational. We might say that, from the purview of the national proscenium, a posthegemonic situation holds. That is, the "compromise solution" that culture provided for Gramsci is not now one that pertains to the national level but to the local and transnational. Instead, the "culture-ideology of consumerism" serves to naturalize global capitalism everywhere.⁷⁹ (Yúdice, 1995, p.13)

Yúdice’s analysis allows us to review the role of the corporate acting as institution, which further promotes cultural research and allows for experimentation while simultaneously offers a globalised unrestricted access to the artist’s work which goes arguably further than any museum acting locally and nationally. With a global recognition and closer to any consumer through their globalised products, the Microsoft Research Institute attempts to act as an unconventional culture and knowledge production center much like the Google Arts and Culture platform previously discussed.

Comparably, the purpose of “The Next Rembrandt”, as described by the online magazine *Adweek*, was to provide an innovative twist to the “stuff” occasion of the bank’s 10-year anniversary as a sponsor of the arts and culture. Indeed, leveraging art as a communications tool to publicly reinforce ING’s benevolent role in the Dutch culture and using one of the most idolised Dutch painters to do so, could be linked to the overall commodification of culture argument discussed by Adorno and Horkheimer. They critique the new “reigning order” of the powerful capital control institutions that design popular culture products to increase their own profit and power:

⁷⁹ Yúdice, G. "Civil Society, Consumption, and Governmentality in an Age of Global Restructuring: An Introduction". *Social Text* (45) 1995 p. 13

In our age the objective social tendency is incarnate in the hidden subjective purposes of company directors, the foremost among whom are in the most powerful sectors of industry – steel, petroleum, electricity, and chemicals. Culture monopolies are weak and dependent in comparison. They cannot afford to neglect their appeasement of the real holders of power if their sphere of activity in mass society (a sphere producing a specific type of commodity which anyhow is still too closely bound up with easy-going liberalism and Jewish intellectuals) is not to undergo a series of purges. The dependence of the most powerful broadcasting company on the electrical industry, or of the motion picture industry on the banks, is characteristic of the whole sphere, whose individual branches are themselves economically interwoven. All are in such close contact that the extreme concentration of mental forces allows demarcation lines between different firms and technical branches to be ignored.⁸⁰ (Horkheimer and Adorno, 1944. Par. 8)

In their view, although arts and culture aim to distract us from our daily working lives, they eventually transform our aesthetic appreciation into “an extension of labor under late capitalism”. Consequently, instead of reforming ourselves with mental stimulation that can enhance growth and promote societal and political transformation, we remain caged by pre-decided cultural products which take on an omnipresent role in our daily lives. Still, should we attempt to review “The Next Rembrandt” project authorship, we can first identify that intentionality lies potentially with the structures behind the commission of J. Walter Thompson (JWT).

Assuming that originality is indeed a rare phenomenon both in art and technological innovation, it is worth reviewing one more project that follows a similar pattern in terms of appropriation and reproductivity of art that was demonstrated in “The Next Rembrandt”. Some months prior the Next Rembrandt’s public viewing, a paper called “A Neural Algorithm of Artistic Style” by a group of Machine Learning researchers discussed the technique used to complete a similar art-focused initiative powered by AI, in which the objective was to filter photos by a famous painter’s signature style.

⁸⁰ Horkheimer, Max, Theodor W. Adorno, and Gunzelin Schmid Noerr. *Dialectic of Enlightenment: Philosophical Fragments*. 1944 Stanford, CA: Stanford Univ. Press. 2002

In fine art, especially painting, humans have mastered the skill to create unique visual experiences through composing a complex interplay between the content and style of an image. Thus far the algorithmic basis of this process is unknown and there exists no artificial system with similar capabilities. However, in other key areas of visual perception such as object and face recognition near-human performance was recently demonstrated by a class of biologically inspired vision models called Deep Neural Networks.⁸¹ (Gatys, Ecker, Bethge, 2015, p.1)

Using the discussed algorithm, the researchers processed a photograph taken at the banks of a river in Tübingen, Germany (Fig.15) and retouched the photo to resemble the painting style of famous artworks like J.M. Turner's "The Wreck of a Transport Ship" (Fig.15), Van Gogh's "The Starry Night" (Fig.17), Edvard Munch's "The Scream" and others. In this case, the researcher's project, named Vincent after Vincent Willem van Gogh - another Dutch painter - seems to have the intent to use AI as a tool to "retouch" one's pictures or designs with a signature style of a famous artist.



Fig.15: Deep learning algorithm,
From left to right: Picture without filter; Van Gogh's "Starry Night" filter; Turner's "The Wreck of a Transport Ship" filter
Courtesy of University of Tuebingen.

The authors further specify in their paper in regards to the method used to produce the filters:

The system uses neural representations to separate and recombine content and style of arbitrary images, providing a neural algorithm for the creation of artistic images. Here we introduce an

⁸¹ Gatys, L. Alexander, E., and Matthias, B. "A Neural Algorithm of Artistic Style." Journal of Vision 16, no. 12 (2016): 326. doi:10.1167/16.12.326.

artificial system based on a Deep Neural Network that creates artistic images of high perceptual quality.⁸² (Gatys, Ecker, Bethge, 2015. p.1)

Appropriating the style of an artist has been seen many times in art as discussed in Part I, with well-known representatives as Andy Warhol or Deborah Kass proving that it is not about copying but creating from a new point of view as explained by Schneider:

In separating images from the original context of their own media, we allow them to take on new and varied meanings. The process and nature of appropriation has considered by anthropologists as part of the study of cultural change and cross-cultural contact.⁸³ (Schneider, 2007. p.24-25)

What makes it challenging for the audience to accept the use of a technique that was previously only available to a distinguished painter some hundred years back, is the acceptance of democratisation of that means of production that takes the spotlight off the individual as an expert and pays tribute to his technique. Nevertheless, unlike the case of the University researchers experimenting with technology, the case of companies involved in those experiments, allows for favourable advertising which consequently compliments the company's overall Public Relations activities. As best described by Mogensen:

While existing research suggests that an important function of public relations is to create a perception of legitimacy and that the hope of economic and commercial public diplomacy is to create a perception of attractiveness among the public in foreign countries, this paper suggests that the concept of corporate public diplomacy – that is, collaboration with the general public in a host country through negotiations directly with civic society – should be considered a supplement to other forms of corporate diplomacy.⁸⁴ (Mogensen, 2017. p.1)

⁸² Gatys, L. Alexander, E., and Matthias, B. "A Neural Algorithm of Artistic Style." *Journal of Vision* 16, no. 12 (2016): 326. doi:10.1167/16.12.326. p.1

⁸³ Schneider, A, "Appropriation as Practice. Art and Identity in Argentina, Palgrave Macmillan pp.24-5, 2007

⁸⁴ Mogensen, Kirsten. From public relations to corporate public diplomacy Sep. 2017. Accessed Mar 3, 2019 <https://doi.org/10.1016/j.pubrev.2017.03.011> - Abstract.p.1

Indeed, it becomes clear that a company's public image can be significantly impacted by a demonstrated cultural diplomacy which allows for a direct liaison between the national history and the corporate roots. According to this standard, the corporate benevolent sponsorship for a project which seems to benefit only the public and not the company directly, allows for an improved and arguably visionary perception of the overall public image of ING and the stakeholders involved. With a clear intention to appropriate the Dutch artist's style and work patterns, the collective instead named the work "the Next Rembrandt", suggesting a notion of continuity that attempts to potentially eternalise his work through the immortalisation of his technique by AI.

4.2 The Next Rembrandt comes to life

Following the interdisciplinary initiatives mentioned previously, J. Walter Thompson (JWT), the global marketing communications agency, would design the case study to be reviewed, an awarded marketing campaign for the Dutch multinational banking and financial services corporation ING called “The Next Rembrandt” (Fig.16). Along with Microsoft, the Delft University of Technology, the Mauritshuis and the Museum Het Rembrandthuis, J. Walter Thompson designed a collaborative project which aimed to leverage Machine Learning in order to recreate a painting that would resemble the work of the Dutch ‘Golden Age’ baroque icon: Rembrandt Harmenszoon van Rijn.



Fig. 16. JWT
“The Next Rembrandt”, 2016, 3D print
Photograph by Robin Van Lonkhuijsen / AFP / Getty⁸⁵

This project’s participants are not clearly identified as artists since there is in fact, no other artist name mentioned other than that of Rembrandt. Also, the project could be initially described more like a marketing campaign⁸⁶ than a work of art. But with the various intentions as expressed by the companies and researchers involved, the interdisciplinary functions of those stakeholders, as

⁸⁵ Schjeldahl, Peter. “A Few Words About the Faux Rembrandt”, The New Yorker, April 8, 2016, Accessed: March 23, 2019

⁸⁶ On June 2016 “The Next Rembrandt” was distinguished at the Cannes Lions International Festival of Creativity and received the Innovation Lion, two Grand Prix for Cyber and Creative Data, three Silver Lions (one for Cyber and two for Creative Data) and a Bronze Lion for Creative Data. To date, “The Next Rembrandt” has received a total of 15 Lions Awards. (Clarke, 2016)

well as the concepts of originality and reproducibility of the work of art⁸⁷ (cf. Benjamin, 1926), this case study is a valuable asset to this research.

To fully devise and bring into life the reproduction of Rembrandt's mastery of light and colour, a team of twenty people collaboratively engaged in the mission to make AI replicate and bring back to life the works of the artist for 18 months. By the means of appropriation of 168,263 fragments taken by Rembrandt past paintings, the objective was to produce one single portrait that showcases the same style and painting techniques, based on the painter's previous work pattern and even brush strokes, replicating the artist with astonishing detail.

More than a mere resemblance, the reproduction was designed to replicate the artist's technique with absolute accuracy, such that makes it arguably an object that resembles a copycat artist.

The strategy for completion was to gather data from all known 346 Rembrandt paintings and through the process of combining them, attempt to generate a new work which would still be based on patterns and inspirations that were previously demonstrated in the painter's work.

The creation process required extensive research, data collection, as well as continuous curation for the aesthetics of the portrait to closer resemble the 17th-century Baroque style and mastery of light, unlike the "fuzzy" forms of other AI generated works as we will be seeing in the next chapters.

[...]the subject's features were generated in the style of Rembrandt. A software system was designed that could understand Rembrandt based on his use of geometry, composition, and painting materials. A facial recognition algorithm identified and classified the most typical geometric patterns used by Rembrandt to paint human features. It then used the learned principles to replicate the style and generate new facial features for the painting.⁸⁸ (The Next Rembrandt, n.d.)

⁸⁷ As presented in chapter one, Benjamin highlighted the fact that once a work of art is reproduced by mechanical means it loses its unique presence in space and time and thus its "aura" which makes it unique.

⁸⁸ "03 GENERATING THE FEATURES", The Next Rembrandt, n.d. Accessed: May 12, 2018,

On the website of the project, there is a clear description of the process used to create the painting. Through stating that data is the painter and technology the brush, the campaign attempts to blur the lines between artist and machine, while the algorithm is promoted as the creative force behind the final work.

Indeed, the mastery of the detail is remarkable, and the light functions closely resemble the Baroque period paintings which, much like the ING communication strategy agenda, also served political and religious purposes. LeBourdais further explains, “occurring between the ages of Enlightenment and Absolutism, Baroque style was encouraged as a powerful device for the Counter-Reformation, contributing to the reassertion of the Catholic Church through art” (LeBourdais, 2016).

In the short video of the project campaign, the director of technology, alongside two developers involved, discusses how the data helped them reach a conclusion as to what the subject should be. The director explains how statistical analysis pointed to the fact that the most usual subject painted by Rembrandt was a portrait of a Caucasian male, between thirty and forty years old, with facial hair, dressed in black, with a white collar, wearing a hat and facing to the right.

The project description reads to:

It’s been almost four centuries since the world lost the talent of one its most influential classical painters, Rembrandt van Rijn. To bring him back, we distilled the artistic DNA from his work and used it to create The Next Rembrandt. [...] To master his style, we designed a software system that could understand Rembrandt based on his use of geometry, composition, and painting materials. A facial recognition algorithm identified and classified the most typical geometric patterns used by Rembrandt to paint human features. It then used the learned principles to replicate the style and generate new facial features for our painting.⁸⁹ (The Next Rembrandt, n.d.)

⁸⁹ “The Next Rembrandt” YouTube 4:20, Published by The Next Rembrandt on Apr 5, 2016 Accessed May 12, 2018 <https://www.youtube.com/watch?v=IuygOYZ1Ngo>

Extracting the features from Rembrandt's previous portraits, in order to identify what a typical Rembrandt eye, nose or ear should look like (Fig. 17) is in fact what makes the artistic appropriation a fundamental element in the creation of this work. What makes it more than a mere technological project is that it draws its inspiration from one of the most accomplished painters in Dutch art history and could, in fact, mimic his work down to the brush strokes while using a new medium for production: AI.



Fig. 17 The Next Rembrandt
Geometric analysis of features in "The Next Rembrandt."
Photo: ING The Next Rembrandt.

As a final step, following the data to determine what the subject should look like or how the algorithm should perceive the Rembrandt style, the team used a height map to detect how the paint layers should be presented and used a 3D printer to create the physical copy of the painting.

We looked at a number of Rembrandt paintings, and we scanned their surface texture, their elemental composition, and what kinds of pigments were used. That's the kind of information you need if you want to generate a painting by Rembrandt virtually.⁹⁰ (Dik quoted by Porter, 2018)

It is important to note that Rembrandt, a known innovator among Dutch artists, combined different oil painting techniques of the 17th century, including the Flemish, Direct Painting,

⁹⁰ Porter, Lizzie "Is this the ultimate Rembrandt portrait?", The Telegraph, Published Apr 6, 2016, Accessed on: March 21, 2019 <https://www.telegraph.co.uk/news/2016/04/05/is-this-the-ultimate-rembrandt-portrait/>

Venetian or Direct Technique⁹¹ to produce new aesthetic results. This was especially relevant with regards to the layering of his work. Therefore, in order to accurately recreate his style, an individual would need to mix multiple techniques to try to duplicate it and even in doing so, the chance of failure would likely be high without the guidance of the artist himself. Of course, the benefit of using deep learning, in this case, is that the machine can distinguish details that the human eye might miss through acting as a ‘superhuman’ with increased brain functionality that, unlike us, requires no motivation or psychological focus to perform.

The final step was printing the painting. Canon has a high-end, custom-made 3D printer that is specially designed to re-create existing paintings. So far, it had never been used to create a new painting. Until now. We printed thirteen layers of a special paint-based UV ink, to bring The Next Rembrandt to life.⁹² (Flores quoted by Dutch Digital Design, 2018).

The final result resembles a painting of the time of Rembrandt, portraying a man of the time, that gives no trace of contemporary other than the medium used to create it. Nevertheless, after breaking down the steps that led to the creation of “the Next Rembrandt”, it is clear that the project is far from a traditional artwork. Instead, it has been created through novel techniques borrowed by the field of cognitive sciences and with more than one agent acting as the artist.

⁹¹ E Van de Wetering discusses extensively the painter’s techniques in his book “Rembrandt: the painter at work” published in 1997 by the Amsterdam University Press. Taking as a case study Night Watch, the author elaborates on the diversity of techniques used by Rembrandt in all his paintings and how, although based on techniques passed on to him by his teachers and mentors, showed considerable innovations in the know-how of his work.

⁹² Dutch Digital Design “The Next Rembrandt: bringing the Old Master back to life”, Medium (web log), Published Jan 24, 2018, Accessed on: March 2, 2019

4.3 Is this Rembrandt's or the AI's work?

Since Machine Learning is at its core highly dependant on data that is curated, classified and reflects a certain visual culture, appropriating someone else's work is, in fact, a prerequisite for any result to be generated. Authorship, on the other hand, requires us to ask whether that algorithm was created on its own, chose the subject, curated the data and can be held responsible for the final result. Is this a copy of Rembrandt's work? To better illustrate the importance of copy and original in the case of "The Next Rembrandt", we could discuss the case of the attempt to reproduce using technology the work of another grand master, Johannes Vermeer.

"The Girl with the Pearl Earring" (1665) (Fig. 18) perhaps the most well-known work of the Dutch painter became the subject for a similar to the Rembrandt project this time sponsored by Google Arts and Culture Institute and with the purpose of studying the painting using state-of-the-art techniques.

The Mauritshuis museum in The Hague, which owns what is perhaps Vermeer's best-known masterpiece, Girl With a Pearl Earring, has teamed up with Google Arts & Culture in Paris to build an augmented-reality app that creates a virtual museum featuring all of the artist's works.[...] "This is one of these moments when technology does something that you can never do in real life, and that's because these paintings could never be brought together in real life," said Emilie Gordenker, director of the Mauritshuis.⁹³ (Siegal, 2018)

In the official page of the painter in the Google arts platform, one can look closely to all of the painters work and zoom in to study closely the details. "Meet Vermeer" is a project which took on the task to leverage technology in order to virtually present all of the Vermeer paintings but also reproduce the Girl with the Pearl Earring using 3D technology and AI to replace the painting during its two-week restoration process. Although the copy resembles the original down to the last brush stroke, the 3D print is not the original. And the difference between the two is the fact that one was created by Vermeer himself, in the time and place that allows it to have a unique

⁹³ Siegal, Nina, Want to See All the Vermeers in the World? Now's Your Chance The New York Times. Published Dec 8, 2018, Accessed Mar.12, 2019
<https://www.nytimes.com/2018/12/03/arts/design/meet-vermeer-google-app-mauritshuis.html>

“aura” as per Benjamin’s definition while the other, was made with sole purpose to copy the original and allow for the painting to travel without risking further damage.



Fig.18 Vermeer, Johannes
Girl with a Pearl Earring (1665) oil on canvas
Mauritshuis, The Hague.
Ian Dagnall/Alamy

In this case, the two paintings are identical leaving no doubt as to which one is the product of the famous painter and which the copy. In the case of the Next Rembrandt though, the painting is different and does not aim at posing as a Rembrandt but as the collective effort of a team dedicated to the further investigation of the painter’s techniques. And it is this scientific intention which perhaps separates it from an appropriation work and puts it closer to the definition of a reproduction.

In parallel to the Vermeer reproduction, it would be interesting to look into the work of an artist duo from Portugal, Sara e André who have been appropriating other artist’s work through their project “Sara & André Foundation”. The duo founded the foundation which comprises of an unconventional collection of commissioned works by “many Portuguese artists, musicians and performers... based on contractual instructions rooted in previous works by those artists.” (Afonso, 2010, p.1). As Rita Sobreiro, curator puts it, “more than a presentation of

representations or a mere gallery of portraits, the Foundation's works compel to the questioning of the idea of authorship. The works not only belong to them (right of ownership) but they generally are of them (copyright)." (Sobreiro, 2008, p.2) The merge of the pair's instructions and intentions with the artists "labour" produces a new work which now belongs to the foundation, both spiritually and legally as an intention, instruction work product and artwork. Their work allows us to draw a parallel with "The Next Rembrandt" which perhaps unintentionally follows on the path of instruction art.

Thus, when reflecting on the authorship of such a work, we need to first individually evaluate each participant's contribution, and consider the algorithm, the appropriation of the works of Rembrandt, the agency of the development team and the curatorial team, as well as the corporate commissioners of the work in a Collective Creatorship equation (cf. Bantinaki, 2016). Bantinaki explains that in commissioned works, contributors of the project can not claim authorship as they are not directly linked to the creative work but merely the implementation.

But the creative contribution of an individual commissioned to produce a work cannot be acknowledged in terms of authorship as it is relevant to the creative origins of the artwork and not to the authority for its production that authorship, in effect, entails (authority being relevant to direct responsibility and power of decision with regard to its artistic properties, which only the artist bears as explained above).⁹⁴ (Bantinaki, 2016, p.21)

Indeed, it would be naive to suggest that the algorithm itself, with complete, unsupervised freedom and capacity to hand-pick any subject, dataset or theme, without time restriction, would actually attempt to create a work that resembles a Rembrandt. An algorithm is built to solely mirror the same cognitive capacities of a human, but unable to act independently or take decisions without suggestion by its developer and a concrete plan as decided by the patrons and permitted by the algorithmic function -The choice of subject is simply linked to the cultural significance of the artist's work for the Dutch Art History, home of the multinational bank that

⁹⁴ Bantinaki, Katerina. "Commissioning the (Art)Work: From Singular Authorship to Collective Creatorship." *The Journal of Aesthetic Education* 50, no. 1 (2016) p. 21. doi:10.5406/jaesteduc.50.1.0016.

sponsored the initiative, but also the plethora of paintings available to be used as data sets to train the machine learning models that would create the painting.

Also, the development of the AI used in this project proves that it can take no unsupervised decision, aside from choosing the best statistical match when designing the painting based on Rembrandt's work. Introducing it as an independent artist is still an exaggerated overstatement and does not take into account the algorithmic design, as written by a computational science expert, the selection of the data that were used to teach the algorithm and the continuous curation of the aesthetic result until the final portrait was created.

With regards to possible authorship assigned to Rembrandt himself, we need to consider that his work is indeed the primary inspiration and painting technique to be appropriated by the project. However, assuming the artist would have selected, should he be alive, this particular subject, although a statistical probability, is founded solely on his paintings and does not take into account the artist's creative evolution, intention, state of mind or even the lack of a real model. And although the aesthetics remain in line with his original works, as the uniqueness of space and time is missing, the work could not possibly be attributed to Rembrandt and arguably does not attempt to do so.

As to the selection of the subject and the desired aesthetics of the work, we need to attribute primary authorship to J. Walter Thompson, and ING that commissioned them to come up with an artistic original concept. As the originators of the work of art in this case, they are in theory the authors of the final result. Nevertheless, implicating AI as the tool means that the creatorship of this work requires the critical participation of a number of stakeholders that not only execute the concept but also take important creative decisions, such as data selection and algorithmic structure, along the process. Therefore, we should consider this collaboration a co-creativity process with an interdisciplinary collective attempting to reproduce Rembrandt's legacy, while at the same time applying their own individual aesthetic criteria.

We must also acknowledge the originality of the algorithm which becomes a unique tool, fully trained with Rembrandt images, that has the potential of generating paintings that appropriate the style of the artist.

The authenticity of a thing is the essence of all that is transmissible from its beginning, ranging from its substantive duration to its testimony to the history which it has experienced. Since the historical testimony rests on the authenticity, the former, too, is jeopardized by reproduction when substantive duration ceases to matter. And what is really jeopardized when the historical testimony is affected is the authority of the object.⁹⁵ (Benjamin, 1926, par.7)

In Benjamin's words, the authority of the object in question is only jeopardized if we try to compare it to the works of the great master or wish to grant the authorship to Rembrandt himself. Still, even if we could attempt to evaluate this painting in comparison to works of art created by Rembrandt back in the 17th century, it would take it out of its original time period and context and remove the function it came to serve, which greatly impacts the final interpretation of the work.

But if we consider it as an attempt to depict a classical subject portrayed through a novel medium of production, the diversity of the actors that participated in its creation and its chronological placement, *The Next Rembrandt* could be considered an authentic artwork thanks to AI, as its artistic medium that "seeks that which makes it unique among the possible mediums and then purifies itself of anything other than expression of its own uniqueness as a form" (Greenberg, 1961).

Moreover, there are certain notable references that could be highlighted that lie in the concept of reproducibility of the work of art and learning through repetition. Rembrandt, who is known as the master of the human face for the way he portrayed his subject's emotion, aside from being a painter and printmaker, he was also a teacher. There are more than 39 notable pupils and

⁹⁵ Benjamin, Walter, Hannah Arendt, ed. "The Work of Art in the Age of Mechanical Reproduction", *Illuminations*. London: Fontana 1968, par.7

assistants, whose work is very often featured in museums and exhibitions alongside the great master's paintings.

It is known that instead of training pupils from the beginning, Rembrandt was keen on taking in young artists who already had some art skills and were trained to paint similar to Rembrandt's style. Art skills necessary for assistants were achieved by copying the master's works and by making variations of Rembrandt's paintings, including self-portraits. (Richy, 2018)

There are many notable painters of the Golden Age of the Dutch art that were in fact either pupils of Rembrandt - in Leiden or in Amsterdam - or were clearly influenced by his style and were creating works that bare great resemblance to those of the great master, or used his style before evolving into something different. Indeed, works created by his pupils, such as Carel Fabritius or Gerrit Dou have been established among art critics as worthy representations of the era's most talented and original painters. Original, even if their initial painting techniques were borrowed heavily from Rembrandt's own techniques. With the concept of "originality" addressed in novel ways by artists such as Marcel Duchamp or Elaine Sturtevant, it could be apt to acknowledge that should Rembrandt be alive to continue teaching his technique, The Next Rembrandt algorithm would be a pupil of the highest performance level, which brings us back to the subject of authorship.

The Next Rembrandt project was met with global recognition and contradictory reviews, and it also generated a discourse as to what can AI bring to the current art scene and how technology can be leveraged to preserve, reproduce and study art. Another potential deduction that could be deduced while examining the project, is also how control structures can utilize such a transcendent medium for the fulfillment of their own corporate agendas. As such, following the close review of the case of the project, we can conclude that the machine did not act independently and autonomously as a copycat of Rembrandt but the intentionality of a global capital control mechanism that needed to optimize their public image powered its creation. As a whole, we can safely assume that the project did not aim at replacing the Dutch master but to appropriate his popularity for the purpose of the bank's marketing campaign which coincidentally

resembles the motives behind many of Rembrandt's own famous artworks like “The Anatomy Lesson of Dr. Nicolaes Tulp”(1632) (Fig.19) work which was commissioned by the Amsterdam Guild of Surgeons , or “The Sampling Officials” (1662) for the the Amsterdam Drapers Guild.



Fig. 19: Rembrandt van Rijn (1606 - 1669)
The Anatomy Lesson of Dr Nicolaes Tulp (1632)
height: 169.5 cm - width: 216.5 cm
Mauritshuis, The Hague.

Although the Next Rembrandt served as a tool for cultural diplomacy and corporate public relations, Rembrandt's own commissioned works were aimed at his further establishment as an artist as well as for financial reasons. From a historical point of view, most of the artworks created during the Baroque time in most of Europe were largely influenced by the Protestant Reformation and consequently served the political intentions of the most influential institution during the 17th century, the Catholic Church. However, the Dutch Golden Age was a time of great colonial, scientific and artistic development for the Dutch republic in which art collection was mainly controlled by an increasingly wealthy middle class that engaged in international trade or sciences.

The Dutch Golden Age (17th century) was a period of great wealth for the Dutch Republic. With the East India Company (VOC), trade blossomed. Cities who were members of the VOC were

among the richest in Holland, and the rich history of these cities is still visible in their many mansions, canals, churches, city walls and harbours. Art and science blossomed as well, which can be seen in the paintings of the famous Dutch Masters: Rembrandt, Hals, Vermeer and Steen.⁹⁶ (“The Dutch Golden Age”, n.d)

Along with the sovereign regimes in Europe, the Dutch art would also depict influential figures of their time, although instead of kings and their lavishing lifestyles, artists would be painting merchants or doctors who had now the financial capacity to purchase their work. Thus, we can presuppose that Art has largely served different intentions, not simply during Rembrandt’s time but since antiquity and to our days. Whether artists expose the weaknesses of a system or align with it to produce a sufficient number of artworks to satisfy their buyer’s needs, the human intention and artist’s unique interpretation remain to this day an undeniable fact when evaluating the importance of art.

The established freedom of speech and expression in many countries of the Western world, along with the democratisation of art and accessibility in means of production and commercialisation have since somehow liberated artists and allowed them to depict or discuss any subject that they chose, whether it is critical or not. However, with a global art market that is governed by the interests and monetary power of few privileged collectors and art dealers, who consequently have caused an unprecedented artwork price inflation, it becomes a valid question, whether technology could shift that power balance into a new establishment. The automation and “anonymisation” of the artist under new tools made available through technological development, raise the question of whether a new technically skilled elite is rapidly influencing the further commodification of culture.

Hence, when we examine cases such as *The Next Rembrandt*, it is worth taking into consideration the overall intentions and context that hides behind the work and is unavoidably linked with the new age of patronage politics in the arts and culture but also evaluate the end

⁹⁶ “The Dutch Golden Age”, Holland, n.d. Accessed Mar. 3, 2019.
<https://www.holland.com/global/tourism/holland-stories/golden-age.htm>

result as a unique product of co-creative process, instilled with various different contexts, depending on one's personal view and interpretation.

Nevertheless, although we cannot assign authorship to a single agent, it is worth acknowledging the algorithm's contribution as a unique medium that when applied to art and cultural heritage, can become a vessel to preserve the painting techniques throughout time. Machine Learning algorithms, when applied in a technique focused manner could become a digital preservation tool not just for the paintings but primarily for the unique technique of the artists, while it creates a means for a globalised and democratised production process, whose mastery would require years of practice to accomplish manually, if ever successful.

Therefore, addressing *The Next Rembrandt* as a fake Rembrandt generated by a machine, is a miscalculated assumption that fails to take into consideration critical factors, and acknowledge it as what it attempts to be: a novel approach to art production that creates a tool to preserve an artist's legacy, further than his paintings. It is also a work that makes you think, reflect on our formerly established views on what art is and can do, instill and translate an experience across space and time, just like art.

5. The Belamy family portraits: The art of business

5.1 Cutting corners for the Art

A case study that should allow us to further review the authorship and appropriation questions of this research is the first AI artwork to have been officially sold as a non-human work by an auction house to date. The Portrait of Edmond Belamy (Fig.10), as part of a series of eleven portraits to be reviewed in this chapter, was created using GANs (Generative Adversarial Networks) by Obvious, who appropriated the open-source algorithm of another artist to produce portraits that they later signed with a mathematical formula and sold for \$432,500 at a Christie's auction. The particulars of the Belamy portraits will allow us to examine not only the agency of the works along with the intentions of a very human collective but also the socio-economic impact of collectible art and how the approval of an auction house like Christie's can promote the legitimization of AI art and exponentially increase its value.

To better understand the intentions and overall objectives behind the series of portraits, this analysis will primarily critically examine the collection itself as well as the narrative discourse surrounding it, starting from the creators views, as published online, to the art world and media reviews, and it will investigate how the context contradicts or compliments the final aesthetic and artistic result. Moreover, to better understand the claims of the agency appointed to the technology used for the production of the works and the potential influence of this line of thought, this chapter will secondarily attempt to identify an author for the works other than AI and justify its "value" in terms of Art market criteria. Unlike the "Next Rembrandt" project, which was a one-time collaboration of different clearly identified corporate stakeholders, aiming to recreate the classical style of an old master, the Obvious collective is comprised of three young French business and machine learning graduates, "a Paris-based collective of artists, Machine Learning researchers and friends interested in AI for Art" as they self-identify in their blog, that attempt to literally and metaphorically blur the lines that distinguish the artist from the machine.

The subject of authorship of the Belamy portraits becomes perhaps more complex when considering that neither the idea nor the medium was developed entirely by Obvious. A young artist Robbie Barrat was, in fact, the one who adapted the original GAN algorithm by adapting the code to work with historical paintings and then published an open source Github project, along with already trained networks and detailed instructions on how to reproduce his work, very much like LeWitt's conceptual instructions work⁹⁷.

In conceptual art the idea or concept is the most important aspect of the work. When an artist uses a conceptual form of art, it means that all of the planning and decisions are made beforehand and the execution is a perfunctory affair. The idea becomes a machine that makes the art.⁹⁸ (Lewitt, 1967, p.1)

The self-taught AI artist has experimented with GANs in other applications including landscapes or nudes, while according to the articles that surfaced after the sale of the painting, the collective was urging the artist to advance on his publicly shared work prior to the creation of their work.

To all appearances, Obvious based their work on the original idea and instructions of Barrat and used it to create a series of portraits, that was later on framed and signed with the algorithm formula. Whilst appropriation is common among artists as previously discussed and does not in any way insinuate theft, in the case of the Belamy family the line is substantially fine.

It is important to clarify that the Belamy portraits do not appear to intend to fall in the conceptual art category, although their project does make one think of “The Richard Mutt Case”. What Duchamp attempted to accomplish with his Fountain, was to explore the limits of tolerance to novel art expressions. He similarly used a readymade (in the Obvious case an AI readymade), signed it with a pseudonym and submitted it for consideration to the “Society of Independent

⁹⁷ Sol LeWitt (1928–2007) was an American conceptual artist. LeWitt's work, especially the wall drawings, has been critically acclaimed for its economic perspicacity. Though modest—most exist as simple instructions on a sheet of paper—the drawings can be made again and again and again, anywhere in the world, without the artist needing to be involved in their production.

⁹⁸ Lewitt, Sol. "Paragraphs on Conceptual Art ". Artforum. June, 1967 Accessed Mar 9, 2019 https://www.corner-college.com/udb/cproVozeFxParagraphs_on_Conceptual_Art._Sol_leWitt.pdf

Artists” that as expected for the time’s prejudice regarding what art should be, rejected it. Whether Mr Mutt with his own hands made the fountain or not has no importance. He CHOSE it. He took an ordinary article of life, placed it so that its useful significance disappeared under the new title and point of view—created a new thought for that object.⁹⁹ (Duchamp, 1917 quoted by Larson, 2013, p.38)

Like many others after him, Duchamp’s declaration of artistic freedom opened up the way for artists who wish to work outside the pre-established notions of what is perceived as artistically significant. On the other hand, the French collective did not appropriate the AI algorithm in a new context, Barrat did. Moreover, their purpose was not to ask a question or critique the institutional perception of Art, but instead, they concealed the fact that their algorithm was someone else’s work and attempted - in fact, succeeded - to fit into the established and problematic idea that the art world would not question it. The plagiarism of the medium is in fact what raised a series of ethical questions in the criticism that followed the sale. However, the mystical AI generated context the works were framed with, allowed Obvious to draw the interest of mass media, collectors and of course Christie’s.

But before we get into a detailed analysis of the role of the humans behind the paintings, it would be useful to understand what are the artworks made of, based on the explanations provided in the website of the project:

It is a 70x70cm artwork, with a golden wooden frame. It is almost similar to a 18th century portrait that you would see in a classical museum. However, it is made by a machine. We trained GANs on classical portraits and used super-resolution algorithms to produce this high-resolution painting. They say art is a way to send a message, and we wanted the world to hear ours. We chose the name “Belamy” to make a reference to the creator name of GANs, I. Goodfellow, that roughly translate to “Bel ami” in French. Also, as the signature of the artist, we wrote the formula of the loss function of the original GAN model: The original loss function of GANs is written as a

⁹⁹ Larson, Kay. *Where the Heart Beats: John Cage, Zen Buddhism, and the Inner Life of Artists*. New York: Penguin Books, 2013.

signature on the artwork. By doing this, we do not consider ourselves as the creator of this artwork. We'd rather give credit to the algorithm than created this painting.¹⁰⁰ (Obvious, 2018)

Should we start by the analysis of the different authorship references mentioned, it is clear that the group made some strategic marketing decisions that would allow the works to be referenced by the technological means used to produce them instead of the independent decisions made by human minds or the creative process and continuous curation of the result. By translating the name of GAN class creator Ian Goodfellow into the french soundalike "Belamy" and using the mathematical function as the signature, Obvious demonstrates a Futurism-like¹⁰¹ obsession with the technological aspect of the process and at the same time produce a work that becomes perhaps more conceptual than they intended to.

We declare that the splendor of the world has been enriched by a new beauty: the beauty of speed. A racing automobile with its bonnet adorned with great tubes like serpents with explosive breath ... a roaring motor car which seems to run on machine-gun fire, is more beautiful than the Victory of Samothrace.¹⁰² (Marinetti, 1973, p.21)

One of the references that might come to mind regarding the Obvious choice of subject, is the portrayal of the technologist as the new age nobleman while the Enlightenment period reestablished focus to human values metamorphoses into a machine-focus that exceeds in importance the human identity as a whole. That is should we assume the period's philosophical and historical importance was taken into consideration by the collective. This type of artificial intelligence agency idealisation is perfectly reflected in the human signature elimination, a symbol which in both the art and the law was always linked with authenticity and more than that,

¹⁰⁰ AI: The Rise Of A New Art Movement. *Obvious blog*, Feb. 14, 2018 Accessed Mar 9, 2019 <http://obvious-art.com/blog-post.html>

¹⁰¹ Futurism was a short-lived art movement that was born in the early 20th century through the manifesto of Italian poet Filippo Tommaso Marinetti. The movement aimed to celebrate speed and machinery instead of what was considered old and outdated.

¹⁰² Marinetti, Filippo Tommaso, *The Founding and Manifesto of Futurism*, Figaro (Paris, Feb. 20, 1909); Original "Fondazione e Manifesto del futurismo."; Translated in Apollonio, Umbro, ed. Documents of 20th Century Art: Futurist Manifestos. Brain, Robert, R.W. Flint, J.C. Higgitt, and Caroline Tisdall, trans. New York: Viking Press, 1973. p. 21

the establishment of ownership for the creator. According to the group: “We signed with the formula in order to have a clear visual way to show that the portrait was generated by an algorithm”. In their own words and in a very Foucauldian manner, Obvious are “murdering” Obvious to honour AI. Since the state of the art of the technology is not capable of producing a work of art independently, and the algorithm was created by someone else, we could assume that the “death” of the author (cf. Barthes, 1967) is also a convenient choice that allows them to not confront any ethical pitfall. To add to this, as the references attempt to appoint the sole agency to the medium - in this case, GANs- and the group still self-identifies as artists, that clearly raises the question as to what did they contribute to the end result.

5.2 The historical framework of the Belamy portraits

Taking into account the historical reference and the location of the collective, we can assume that the attempt is to reproduce an aesthetic result from the end of the Baroque era to the French Rococo or neoclassical works of the 18th century France¹⁰³. Although the GAN algorithm training requires a considerable amount of data (some online resources mention that the team used 15,000 artworks from online databases), due to the complicated provenance of the tool used, we do not know whether the data was categorized and labelled by Obvious themselves. Also, we can not know with certainty which specific artworks were used to train the GANs or how far back or ahead the timeline selection goes, neither the expertise of the person assigned with the task, since none of the stakeholders involved seems to have that kind of background. According to the online information provided by the collective: “The portraits in this collection depicts various epochs, and seems inspired by a variety of styles and techniques (oil painting, watercolour...). We carefully picked the artworks to illustrate the creative potential of the algorithm, once trained.” (“Obvious, explained”, 2018)

It remains unclear what were the actual artistic movements used or whether the data included scenes or just portraits. Nevertheless, the objective was to mimic a specific period and it is worth looking into the historical framework that was chosen as it should allow us not only to better understand the intentions and vision of Obvious but also, it will provide us with a valuable ideological context for the overall analysis.

The 18th century was a highly transformative period for European philosophy, politics and ethics that aimed to bring back human reason as a means to radically improve society, placing individual freedom and human rights right in the middle of the discourse of the time while the technological developments and the evolution of our understanding of the universe along with the arts was seen by some of the lead thinkers, as an extra means to manipulate the masses. Le siècle des Lumières or Enlightenment as it is widely known followed the Scientific Revolution and the Renaissance period and introduced a philosophical movement that would challenge all

¹⁰³ The two movements will be discussed in further detail in page 114.

previously established assumptions deeply transforming literary and artistic expression of the time and the years to come. The intellectual awakening of the times fueled a series of national revolutions across the world and provided substantial theories that would further establish the basis for cultural criticism of the centuries to come. Perhaps originally sparked by Sir Isaac Newton's scientific breakthroughs related to Mechanics and gravitation¹⁰⁴ and empirical theories as they were developed by thinkers like John Locke, Voltaire, Montesquieu, or Jean-Jacques Rousseau¹⁰⁵, the Enlightenment "understood in the widest sense as the advance of thought, has always aimed at liberating human beings from fear and installing them as masters [...] (its) program was the disenchantment of the world" (Adorno, Horkheimer, 1944, p.1). Whether it was the abolishment of fear of God or the sovereign, investigating the absolutism of the previously established rules of political representation and religious intolerance as instilled in the notorious "*L'État, c'est moi*" of Louis XIV¹⁰⁶, the Enlightenment would mark the beginning of a cultural and philosophical movement that aimed to bring back above all reason or as best described by René

¹⁰⁴ According to "Fundamentals of Astrodynamics and Applications" (p10-11) written by D.A. Vallado, the Principia was published on 5 July 1687 with encouragement and financial help from Edmond Halley. In this work, Newton stated the three universal laws of motion. Together, these laws describe the relationship between an object, the forces acting upon it and the resulting motion, laying the foundation for classical mechanics. They contributed to many advances during the Industrial Revolution which soon followed and were not improved upon for more than 200 years. Many of these advancements continue to be the underpinnings of non-relativistic technologies in the modern world. He used the Latin word *gravitas* (weight) for the effect that would become known as gravity and defined the law of universal gravitation.

¹⁰⁵ Rousseau's works "Discourse on the Arts and Sciences" (1750) and "The Social Contract" (1762) were greatly influential with the first criticising the Arts and Science for disguising inequalities and promoting luxury instead of spirituality and the second, discussing how governments should follow the general will of the people, and those who are against it should be "compelled" to follow the wishes of the majority. According to Rousseau, the sovereigns should not inherit the right to rule and his work inspired great political transformations that eventually led to the French revolution as well as inspired the United States declaration of independence. He has been heavily criticised by many of the philosophers of his time and later on, especially Voltaire.

¹⁰⁶ In the abstract of the collected essays of Herbert H. Rowen, Craig Harline explains: "The customary picture of French kingship in the centuries before the Revolution may be summed up in two phrases, "*L'état c'est moi*" and "*la grâce de Dieu*" (usually Englished as "divine right"): "*L'état c'est moi*" here implies an administrative monarchy equated with the person of the king, and "*la grâce de Dieu*" is concerned with the justification rather than the description of the monarchy. Yet close scrutiny of the historical literature reveals a current of uneasiness — something has been increasingly pushed into the background, something which ought to be in the very foreground of any study of the monarchy of the Ancien Régime, namely, that the king was the proprietor of the state, that he felt, even if he never literally said, "*L'état c'est à moi*" The practice and the words of French kings and statesmen for many centuries, and most of all during the seventeenth, the zenith century of French monarchy, can be clearly understood only if we accept the principle that the dynastic king was, among other things, the owner of the kingdom." (Originally printed by French Historical Studies, 2/1 (Spring 1961))

René Descartes, “Cogito ergo sum”¹⁰⁷(Burns, 2011. p.84). The French philosopher introduced the concept of “I am thinking therefore I exist” in his *Discourse on the Method of Rightly Conducting One's Reason and of Seeking Truth in the Sciences* (1637) as a first step in demonstrating the attainability of certain knowledge (Descartes, 1911/1985, p.417). Descartes attempted to provide an answer to the philosophical question of existence, based on the idea that our capacity to doubt and think is what confirms that we actually exist marking perhaps one of the most influential concepts of the period.

Additionally, during that time, machines increasingly transformed and automated rural production techniques that eventually led to the industrial revolution that changed production and reproduction techniques and allowed for the use of new tools to make art. In a comparative lense, it could be argued that the mechanical revolution the sitter's experience in their own historical framework are parallel to the AI revolution experienced as we examine these artworks. Although the Enlightenment aimed at bringing the human reason at the center, in the age of rapid digital dissemination we witness the exact opposite. Instead of reason, the recent Artificial Intelligence initiatives seem to favour the reason of the machine instead by pushing the human contribution in the secondary role and promoting instead the superiority of the algorithms. The subject of creativity is perhaps the first sign that technological evolution aims continuously to advance machines in a near-human level. Leigh Hafrey, Senior Lecturer in behavioral and policy sciences at the MIT Sloan School of Management discusses how semantics have evolved to address companies as people and people as objects who consequently have no longer the same freedom of will that corporates do.

What are we? Rules for relative pronouns in English dictate “who” to refer to people and “that” to things. Yet daily discourse too often offers “that” (the people that I saw at . . .) for people and “who” (companies or governments who choose . . .) for institutions. However inadvertent, the slippage reveals the place of both in today’s America: Who has the agency or free will normally

¹⁰⁷ Burns, William E. (2001). *The scientific revolution: an encyclopedia*. Santa Barbara, California: ABC-CLIO. p. 84. ISBN 0-87436-875-8.

associated with individual persons when I myself am a “that,” but a Fortune 500 corporation is a “who”?¹⁰⁸ (Hafrey, 2019)

Looking into the art scene of the contextual period of the Belamy portraits, Rococo and Neoclassicism were the two significant movements that could be used to draw parallels with the GAN progress. Unlike the rigid and formal Baroque style of the Renaissance period, the Rococo style was lighter and more hedonistic (promoted in the French royal court by the Louis XV and his mistress Marquise de Pompadour), and while both styles were heavily ornamented and focused on luxury, Rococo clearly shifted towards a less dark, pastel palette. The portraits painted during this period and that were used to train the AI drawing hand, are full of light and depict a more ethereal, romantic and sensual air of the sitters.

The tangled undergrowth of the rococo ornament, emotional disarray in the novel, the stylistic license of the Italian theatre, the spirited idleness of the galant, the genre pittoresque; all deliberately flouted conventions of taste. Exposure to foreign trade and to artefacts and buildings that were remote geographically (Chinese or Indian) or historically (Greek, Roman or Gothic) achieved comparable results and undermined long-established, mostly classical traditions.¹⁰⁹ (Scalbert 1999. p.19)

In opposition to Rococo and perhaps more aligned to the general ideas of Enlightenment, Neoclassicism brought back into focus the classical arts of ancient Rome and Greece.

Johann Joachim Winckelmann, founder of modern archeology and art history, praised the Greeks and believed them to be as close to perfection as possible. Following Winckelmann's words, many artists began to study Greek architecture and create classically inspired works of art. In 1738, excavations of Pompeii and Herculaneum led to the finding of well-preserved, colorful paintings, mosaics, and pottery. These discoveries only fueled artistic fascination and curiosity for

¹⁰⁸ Hafrey, Leigh “Who’s Calling the Shots on Data and AI?” by MIT SHASS Communications. Published 18 February 2019, Accessed Mar 20, 2019.

<https://shass.mit.edu/news/news-2019-ethics-and-ai-whos-calling-shots-data-and-ai-leigh-hafrey>

¹⁰⁹ Scalbert, Irénée. "The Rococo Revolution." *AA Files*, no. 39 (1999): 10-20.

<https://www.jstor.org/stable/29544153>

antiquity, and artists began to use this new knowledge of the past in their art, creating their own “new” classical style that was extremely different from the Rococo—a style popular during the early to mid-18th century.¹¹⁰ (Trapasso, 2013)

By looking into the century’s philosophical and artistic tendencies, while it is clear that inspiration for the concept including the portrait names of the fictional Belamy family is drawn from the French pre-revolution grandeur and nobility superiority illusions of the time, there is no doubt that the overall aesthetic result, including the palette of colours, details or titles, does not match the artworks produced during that time. One of the characteristics that might first seem out of place is that although the portraits belong to French aristocracy of the same family, the clothing and garments indicate different eras or locations with the Comte and Comtesse closer resembling the Rococo of the Louis XV or Louis XVI (Fig. 20) lavishing court fashion while the rest of the family and vaguely shown in a more pastoral life inspired clothing of Neoclassicism that was present in England during that time and in France only after the Napoleonic Empire¹¹¹, well after the French Revolution (which has started in 1789 and ended ten years later).



Fig. 20 Élisabeth Vigée-Lebrun
Marie-Antoinette, Queen of France (1783)

¹¹⁰ Trapasso, Erica. "A Brief History of Neoclassical Art." Artnet News. March 16, 2015. Accessed April 08, 2019.

¹¹¹ The Napoleonic era beginning is marked with Napoleon’s coup d’état, which established the French Consulate. According to Meyer, this era is finished with the Battle of Waterloo (9 November 1799 – 18 June 1815) (cf. Meyer, 1987)

oil on canvas 116 x 88,5 cm cadre: 160,5 x 122 x 15 cm
Courtesy of Château des Versailles

Far from minimalism or simplicity, France was a colonial empire that had access to new materials and international influences from tropical colonies, while the court of Versailles demonstrated an excessive amount of luxury in the use of fabrics (mainly silk or muslin), hairstyles and accessories for both men and women. Feathers, bows, wigs, powdered hair and thick curls were accustomed among the court nobles and it is hard to believe that at the time a woman of the court would be seen in her natural hair, let alone pose for a portrait. Indeed, all three portraits “Madame de Bellamy” (Fig. 21) , “Edmond de Belamy” (Fig.10) and “Marquis de Bellamy” are examples of the algorithm arguably failing to match the historical dress code framework while the title Marquis was abolished by Napoleon during the First French Empire of 1804.

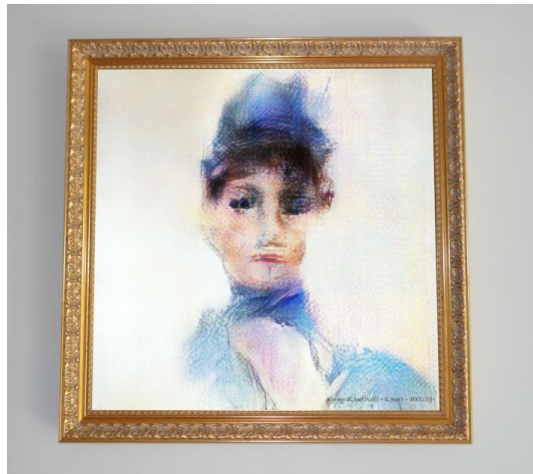


Fig. 21: Obvious
Madame De Belamy (2018)
70 cm × 70 cm (27.5 in × 27.5 in)
Courtesy of Obvious Art Gallery

Although the accuracy of the historical facts or the representation of the fashion is not a prerequisite for the evaluation of the artistic work of the collective, it certainly implies that the algorithm, did not really match or exceed in mastery the human of the days, which would be impossible with the current state of the art of GAN technology. Another safe assumption would be that the data used have surely exceeded the 18th century and more likely expanded towards the 19th and perhaps the 20th century, which naturally greatly impacts the end result and make it

hard to fool the human eye as an almost similar one. In that case, the objective - what Obvious was aiming to achieve as a result - is critical to the overall aesthetic evaluation of the outcome and would greatly differ depending on the individual understanding of the historical elements of the time, as Barthes has discussed on his end. What is, however, the most interesting fact when looking into the portraits, is that one cannot blame the machine. Should we be discussing the aesthetic result of a film or a photograph or video art, chances are that the criticism would not be targeted to the medium used for production but the intention and execution of the project, which requires a clearly identified author. Perhaps what Obvious attempt to achieve by not signing their work, is to safeguard themselves from the criticism and scrutiny any other artist would need to go through to justify the imperfections of their work. Alternatively, and as it can be suspected by the further commercialisation of the work, the signature simply compliments the misrepresentation of the work as AI made.

5.3 Symbolism and meaning in the portraits narrative

During the 18th century Johann Joachim Winckelmann first discussed the concept of beauty as something that should be investigated (cf. Winckelmann, 1768) while later more aesthetics theories emerged to “liberate” art and allow creators to escape the narrow predefined beauty standards of the time. In fact, it would be David Hume who would further discuss subjectivity in art and corroborate that “Beauty is no quality in things themselves: It exists merely in the mind which contemplates them, and each mind perceives a different beauty” (Hume, 1862. p.155). Much like the vision of Barthes in terms of our unique vision in the interpretation of a work of art regardless of its author previously discussed, both theories could frame the Belamy portraits as artworks that can, thanks to their nature, be criticized only as to what they inspire us to feel based on our subjective taste and criteria. That is if AI as “author” was not presented as the most important aspect of these pieces and the creative process.

To better demonstrate the change of our critical perception towards a work signed by an artist and a work signed by a machine we could be looking into a different but very similar GAN painting experiment called “Portraits of Imaginary People” (2017) by Mike Tyka, an artist working with Artificial Intelligence. The portraits included in this collection, that was showcased in international exhibitions, were produced by GAN algorithms that were trained in photos instead of paintings, and show pictures of imaginary people. In this case, the objective of the experiment was to create photographs that would be realistic enough to confuse the human eye as to whether they are real or computer generated. Tyka discusses the creative and learning process as follows:

The series, titled "Portraits of Imaginary People" explores the latent space of human faces by training a neural network to imagine and then depict portraits of people who don't exist. To do so, many thousands of photographs of faces taken from Flickr are fed to a type of machine-learning program called a Generative Adversarial Network (GAN). GANs work by using two neural networks that play an adversarial game: one (the "Generator") tries to generate increasingly convincing output, while a second (the "Discriminator") tries to learn to distinguish real photos from the artificially generated ones. At first, both networks are poor at their respective tasks. But

as the Discriminator network starts to learn to predict fake from real, it keeps the Generator on its toes, pushing it to generate harder and more convincing examples. In order to keep up, the Generator gets better and better, and the Discriminator correspondingly has to improve its response. With time, the images generated become increasingly realistic, as both adversaries try to outwit each other. The images you see here are thus a result of the rules and internal correlations the neural networks learned from the training images.¹¹² (Tyka, 2018)

In the explanation and technical context provided, we can identify that the intention of the artist was to create a work that would look like a photo of a real person and thus Tyka discusses the importance of the “learning” process of the networks as well as the aspect of time. His portraits do not look like real photographs (Fig.20) but there is a real human likelihood which allows us to detect microexpressions, clear lines and a relatively good resolution which could perhaps confuse a viewer into thinking that perhaps there was a real person posing for the work or whose picture was used for it. The fact that Tyka’s work uses the same technology as Obvious makes us wonder as to the effort put in order for the final result to be aesthetically convincing.

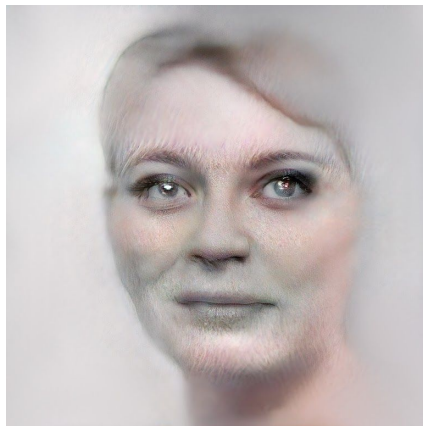


Fig. 20 Mike Tyka
A fleeting memory (2017)
Archival print, 20"x 20"
Courtesy of Mike Tyka

Even if a closer look could prove that the photographs are “touched” by something more than a camera, and the original aesthetic result is awkward, the portraits do partially accomplish the

¹¹² Tyka, Mike. Portraits of Imaginary People, INTERALIA MAGAZINE, Feb.2018 Accessed Mar 12, 2019
<https://www.interaliamag.org/audiovisual/mike-tyka/>

original purpose which is to “fool” the human eye into believing it portrays a real person instead of an AI generated one.

Therefore, comparing to the case of the Belamy family portraits, should the objective were equally to imitate a real visual artist, we can assume that the models were not sufficiently trained to improve the aesthetic finish or capture details such as the facial characteristics or expressions, giving them instead a fuzzy look with nebulous faces and overall lines that contradict the original description of the works as “high-resolution”. Indeed, the blur vision effect only emerged in the art with the works of the Impressionists towards the end of the 19th century and was certainly not an accustomed way to portray nobles in portraits.

It is perhaps because of the specific timeframe it attempts to imitate that the Belamy family portrait series fails to convince of its “authenticity” especially when set across other similar portraits generated by the same open-source algorithm, making it hard to establish whether the effect comes from “artistic” intentionality, algorithmic inadequacy or lack of end result curation and continuous work; all of which are irrelevant when the responsibility lies with AI. Discussing the subject of authenticity and artistic intent, Gordon and Hermens explain that “artistic expression now centres on the creative process rather than the product of that investigation.” (Gordon & Hermens, 2013).

The function of the hand of the artist has become that of ‘placing, ordering and selecting’, according to John Roberts, inviting the labour of others into frame (Roberts 2007: 88). This shift in artistic practice has implications for the identification of the artist’s intent. If the artwork is made from ephemeral materials, is situated in the dematerialised tradition, or is temporally or contextually contingent, the artist’s creative decision-making may not be evident in the artwork’s material attributes. Similarly, the work may evolve with every reinstallation, taking on different forms and significances in each new context.¹¹³ (Gordon & Hermens, 2013)

¹¹³ Gordon, Rebecca and Erma Hermens, *The Artist’s Intent in Flux*, CeROArt [Online], HS, 2013, Published Oct 27, 2013, Accessed on 08 April 2019.

Should we therefore wish to examine Obvious in the place of the artist, as they have appropriated someone Barrat's algorithm, comprising of his own data curation process and choice of subject, the authenticity is significantly jeopardised.

However, the texts that accompany the portraits, have not been generated by AI and it is worth looking into those cryptic quotes that are supposedly attributed to the fictional sitters of the portraits to further investigate the authorship question of this research and perhaps define the author 'as a function of discourse'.

First of all, discourses are objects of appropriation. The form of ownership from which they spring is of a rather particular type, one that has been codified for many years. We should note that, historically, this type of ownership has always been subsequent to what one might call penal appropriation. Texts, books, and discourses really began to have authors (other than mythical, sacralized and sacralizing figures) to the extent that authors became subject to punishment, that is, to the extent that discourses could be transgressive. In our culture (and doubtless in many others), discourse was not originally a product, a thing, a kind of goods; it was essentially an act—an act placed in the bipolar field of the sacred and the profane, the licit and the illicit, the religious and the blasphemous. Historically, it was a gesture fraught with risks before becoming goods caught up in a circuit of ownership.¹¹⁴ (Foucault, 1998, p.211-212)

As per Foucault's historical comparison, the separate quotes that were assigned to each painting are technically written under a pseudonym and as that false identity is also a fictional being, there is no risk of the statements be attributed to their actual authors. Past the naming convention and the temptation to go for a normative approach to identify whether an archbishop of the 18th century Catholic France would openly question the existence of God, lies the opportunity for an empirical analysis that pushes us to seek for hidden meanings, especially since there is a significant confusion of functions. Should we consider as speaker the sitter of the portrait in the original 18th-century setting and presumably as a potentially actual human or is the quote coming from the virtual version of that portrait that is not a real being but a creation of the

¹¹⁴ Foucault, Michel, and James D. Faubion. *Aesthetics, Method, and Epistemology*. New York: New Press, 1998, p.211-212

creation of the author? Also, is the voice and content of that quote perhaps representing Obvious as a collective or one or more individual members of the group?

Who is speaking thus? Is it the hero of the story . . .? Is it the individual Balzac . . .? Is it Balzac the author . . .? Is it universal wisdom? Romantic psychology? We shall never know, for the good reason that writing [écriture <] is the destruction of every voice, of every origin. Writing is that neutral, that composite, that oblique space where our subject slips away, the [photographic] negative where every identity is lost, starting with the identity of the very body which writes. ¹¹⁵(Barthes, 1977, p.142)

Although in Barthes' view any attempt to clarify who is the voice behind the paintings is doomed to be a fruitful quest, we should try to identify some basic functions under which Obvious decided to frame their portraits as that will allow us to better identify artistic intentions - if any - and what might be the message that Obvious as artists were attempting to convey by allowing their portraits to speak. Identifying an intent should perhaps allow us to place the works in a contemporary context which allows the paintings to stand individually as an original creation despite the different misappropriation suspicions.

With a primary analysis we can identify 4 potential voices: 1) the fictional sitter of the portrait in his original historical context as imagined by the audience based on our original understanding of the time, 2) the fictional figure in his/her machine generated context and a 21st century understanding as perceived by Obvious, 3) the Artificial Intelligence voice as generated by a machine without any critical capacity or in-depth understanding of the human condition, again as perceived by the collective or 4) the voice of the collective that uses the portraits to express their own personal thoughts and aspirations in regards to the role of AI in our times. It is worth looking into those voices to further clarify this question. "My maker ? He was probably some

¹¹⁵ Barthes, Roland, and Stephen Heath. Image, Music, Text. The Death of the Author, 1977 London: Fontana Press, Harper Collins Publishers, 2010. p.142

human, there are plenty of them around. Fancy with a taste for mystery. He must have looked like that.” (“Le Comte De Belamy”, n.d.)¹¹⁶

The statements of each character say perhaps more about the creators than about the works themselves, and could be seen as another attempt to confuse the audience about the identity of the artist with subtle but contradictory agency attributions seen in the first two portrait of the Comptesse assuming its creator is human and the Comtesse identifying the AI as the creator of her husbands portrait.

Although it would be easy to assume that these quotes were random and in some cases almost identical (the case of The Duc and the Baron), we should examine the quotes as intentional expressions by the creative. As they present some of the potential benefits of the creation of a self-taught machine, they follow into the pattern of subtly implying a supremacy of Artificial intelligence scientists. They are presented to be “the best talents” with a mission of the highest priority. “I’ll gather the best talents from around the kingdom. They will work on a new machine. One that can learn by itself. Can you imagine the benefits it could bring ?” (“Le Duc De Belamy”, n.d.)

Ambition and a machinery empowered future are very much aligned to the extensive colonisation trends of the time when nobles would own great parts of the land while it alludes to the “Enlightened despotism” that was present throughout Europe by monarchs that wished to implement reforms and improvements. However, that was not the case of France which heavily censored thinkers like Voltaire or Rousseau for their revolutionary thinking as it posed a threat to the sovereign centred structure of the state. That urges us to reject the hypothesis that the quotes aim to represent the historical framework.

¹¹⁶ In the gallery of the official website of the collective (<https://obvious-art.com/>), each portrait comes with an assigned quote. The references refer to each unique portrait page allocated in the website to present the print’s technical and ownership details.

“Men are blinded by fame, power, and money. They don't see the most simplistic beauty, the one that is already all around us.” (“La Baronne De Belamy”, n.d.) The criticism towards human beings (as opposed to machines) for their weaknesses and human traits including greed, vanity or their inability to see beauty is another pattern straight from the Enlightenment. Rousseau made very similar observations and criticized the self-love that people had developed that was powered by the constant comparison with others, what he called “amour propre”. In his essay *A Discourse on the Sciences and Arts* (1750) he argues that people have lost contact with their inborn moral values because of technological advancements and the expression of such an idea seems to be either a paradox or extremely appropriate should we assume that the “author” here is a technological advancement attempting to replace the human artist.

“Men are weak. An opportunity to bring order and harmony - cannot be thrown away under the pretext of few fools - advocating for scattered agitation.” (“La Duchesse De Belamy”, n.d.) At this point, we could be only making assumptions as to what the Duchess quote exactly refers to although it seems to be an attack on those who resist opportunities for improvement and attempt to create confusion instead. Undoubtedly Artificial Intelligence carries great opportunities to establish improvements in many domains of our lives, including to allow for unprecedented automation or realisation of tasks that our human limitations do not allow us to perform ourselves. If we assume that this is what the “Duchess” is referring to then it would fit again in the pattern of human weakness versus machine superpower that has been present in the overall presentation of the work.

The quotes of the imaginary speakers become more strange as we are looking into the statements by Madame de Belamy. “Who said that not having a soul is a default? It makes me unboundable, adaptative, and reckless.” (“Madame De Belamy”, n.d.) Translating the expression in Obvious native language allows us to better understand what the creators were perhaps aiming for since the French translation for “default” would be “défaut” that means a defect or a flaw while the word for reckless would be “téméraire”, that has a positive connotation to it and links more to courage than risk. In that case, maybe the point was to associate the “author” and artist once

again with a soulless machine that is powerful, as it has no boundaries. The human restrictions of a soul that would not apply to machines, could perhaps be identified in its three parts as identified by Plato; our ability to seek the truth (the logical), our anger and the emotional reactions (the spirited) and our need to satisfy our desires (the appetitive)¹¹⁷ all of which are associated to the way of being but should always be governed by logic. Indeed, the Platonic view of the soul was to limit our interaction with art since it nurtures our passion and the human senses and therefore makes us weak. Obvious makes reference to the human soul as something that if it were missing, it would not be a hardship, possibly to further empower the concept that machines are superior to weak men.

On a completely different tone, and with a questionable doubt, the archbishop brings up “god” (with a lowercase g) and advises that “if” there is one it would wish for the human being to work towards the continuous improvement of their characters by using all available means “for as long as he can”. Indeed, the meaning devised by such quotes, should it be linked to the machine as an author - which seems to be the original intention of Obvious- perhaps attempts to inspire a feeling of fear or warning that is inevitably linked to the evolution that lies ahead. “If god is in each and everyone of us we should pray him by bettering ourselves in every way we can imagine, so he may live through us for as long as he can.” (“L'Archeveque De Belamy”, n.d)

With the rest of the quotes following an equally confusing and ideologically contradictory content that touches base on socio-political castes and the bourgeois supremacy it would be safe to assume that the meaning of these expressions cannot be found in a concrete doctrine but they present more a randomised diffusion of a wannabe context that aspires to fill the gap that the machine could not. Nevertheless, the patterns seem to align towards a machinery superiority but also, a condemnation of those who resist such a change as fools that miss the idea of progress.

Although we can safely assume that there is not a very consistent line to tie together the different meanings that could be drawn from the imaginary manifestos of each portrait; there is a strong

¹¹⁷ Plato's psyche theory is discussed in his Socratic dialogue “Republic” in 380 B.C.

repetitive patent of a continuous AI idolisation, making the lead concept that machines are superior to the weak human psyche that is ruled by vanity and greed. Moreover, it could be argued that the continuous attempt to give meaning to a supposed machine-generated work of art that can be evaluated, enjoyed and compared by the human eye and consciousness alone, contradicts once again the original discourse of AI being the artist and inevitably places Obvious at the spot of the human as criticised by the AI fictional works words. Overall, framing the project of Belamy portraits with the ideologies of the Enlightenment that directly contradicts the concept of the weakness of the man against the endless capacity of the machine gives an air of dramatic irony to the portraits that seem to be unintentional by its creators.

5.4 The AI art of business

However, there is one more sociopolitical evolution of the end of the 18th century that should be discussed as an indirect justification for the unprecedented monetary value of “Edmond de Belamy” portrait, and maybe an appropriate example to present the state of the modern day art market circumstances: the birth of a strong middle class with an increased financial power and interest in collecting art. The redistribution of power gave rise to artworks becoming not only a symbol of economic power but also an investment for financial gain by stakeholders who may or may not have a deeper appreciation for it. "For the first time in history, the living standards of the masses of ordinary people have begun to undergo sustained growth" (Lucas, 2002. 109–10) and fine art was no longer accessible to royalty alone with three of the most influential and established auction houses founded during this time. Namely, Sotheby's (1744), Christie's (1766) and Philipp's (1796) that were all established during that time and are leading the international art trade. The rise of the auction houses could perhaps be linked to the radical industrialisation however since then we have witnessed a spectacular growth of the market which remains unregulated and arguably quite unpredictable.

What will, later on, be discussed by Marx through his materialist analysis of production begins to emerge now, and it concerns the alienation from a romantic vision of the artist as an independent creator to Art turning into a commodity and a symbol of power that can be bought, exchanged and auctioned. In fact, very few artists manage to break into the secondary market of auctions that is primarily populated by well-established artists, high-bidders, and questionable provenance criteria:

The secondary market is considerably more concentrated on both buying and selling sides. Only a relatively small proportion of artists make the transition from the primary market, so that in any one center there is only a restricted number of artists represented in the market at any one time. Given the resources required to enter the market on the buying side and the somewhat arcane nature of the product, the numbers of buyers, both individual and institutional, is similarly constrained.¹¹⁸ (Throsby, 1994, p.26)

¹¹⁸ Throsby, David. "The Production and Consumption of the Arts: A View of Cultural Economics." *Journal of Economic Literature* Vol. XXXII (March 1994), p.26. 1994

Moreover, in many big markets like the US, Switzerland or China, auctions remain unregulated and as tax-deductions provide valuable motivation and financial benefits to the wealthy, the financial capital of art has exponentially increased. Most of the artwork transactions take place in private, while it is a well-known fact that among these transactions some contribute to money-laundering schemes, with purchased items stored in freeports, also known as high-security, tax-free zones, that store millions of artworks previously purchased away from the public eye. Therefore, it becomes a valid question of how can a newly founded collective with no prior artwork sales reach the primary art market so fast and sell their work for 45 times its originally estimated value (Cohn, 2018)¹¹⁹.

Ahmed Elgammal, Director of the Art and Artificial Intelligence Laboratory at Rutgers University, believes that the reason behind the price spike is related to Christie's extensive and misleading marketing campaign prior to the sale. He wrote about it explaining that the work was extensively misrepresented as the first AI artwork and one that was autonomously created. The auction house broke all records, last year when it sold a Leonardo da Vinci painting for \$450 million. Indeed, online media reported that Christie's went to great lengths to secure the record price for the historical artwork. Additionally, in a similar tone with Elgmman, GAN Artist Mario Klingemann, was quoted by the New York Times saying that in comparison to the current state of the art, the portrait was closer to a connect-the-dots children's painting, while the paper further adds:

Many artists and researchers who specialize in artistic applications of AI technology, while generally glad of the potential exposure the sale could bring, say that the portrait chosen by Christie's is derivative.[...]The opportunity to capitalize on the buzz surrounding artificial intelligence fits in with Christie's efforts to market itself in new ways.¹²⁰ (Cohn, 2018)

¹¹⁹ According to the New York Times article "AI Art at Christie's Sells for \$432,500" the final auction price for the portrait was 45 higher than the original estimated value by Christies at 10.000

¹²⁰ Cohn, Gabe "Up for Bid, AI Art Signed 'Algorithm'" The New York Times, Oct. 22, 2018 Accessed Dec. 18, 2018 <https://www.nytimes.com/2018/10/22/arts/design/christies-art-artificial-intelligence-obvious.html>

It would be difficult to say with certainty whether the work would have sold as high if it were signed by Obvious themselves, mainly because it is the first AI co-created work of art to be brought at an open auction. Undoubtedly, the mystery surrounding the authorship along with the potential lack of technical AI understanding of the majority of the Arts market stakeholders and the collective initial discourse contributed greatly to the final price and the overall popularity. Discussing the overall integration of AI in the Art market Schneider explains that “authorship determines the piece’s social capital, prestige level, and likely resale price, if not also its craftsmanship level and aesthetic depth. And those factors are what art collecting is all about.” (Schneider, 2018)

In the case of the portraits, the AI at its authoritarian debut was certainly what sparked the interest of the auction house and the buyers and the choice to advertise the works as such, by both the collective and Christie’s is probably best defined as per Andy Warhol’s words, the new “Business Art”. In his book “The shock of the new” (1980) Hughes explains that Warhol was the Dali of the seventies (Hughes, 1980, p.74) and goes on to explain:

Andy Warhol’s work made its final descent into feeble kitsch, but the messages of his career – that the fashion industry was the prime model of culture and that the business of art was business – came down like an avalanche, in the midst of the biggest art-market boom in history.¹²¹ (Hughes, 1980, p.520)

Although being business-savvy is not the stereotypical idea we have for artists, the “Edmond de Belamy” painting was hanging right across an Andy Warhol print and a bronze multiple by Roy Lichtenstein marking its sale with another ironic coincidence, as both artists are known as pop art icons and appropriation masters. Both painting sold for far less than the Obvious print which raises the question on whether novelty wins over quality. Sol Lewitt somehow discussed the relationship among material and idea in his *Paragraphs of Conceptual Art* (1967):

¹²¹ Hughes, Robert, *The shock of the New*, (1980) Alfred A. Knopf, Inc, 1991, p. 520

“New materials are one of the great afflictions of contemporary art. Some artists confuse new materials with new ideas. [...] The danger is, I think, in making the physicality of the materials so important that it becomes the idea of the work (another kind of expressionism)”¹²² (Lewitt, 1996. p.825)

Although the novelty of the medium surely influenced the financial value of the Belamy portrait, it does not necessarily ensure the further establishment of AI as an artist. It could be argued that the prices established through auctions are fundamentally, the values set by a random set of participants who will bid against each other in a process where human psychology defines the outcome more than the subjective or objective value of the work itself. Nevertheless, the value of the work in terms of cultural or social capital will be further defined by time. The concept of time is again key to better discern who is the author of this work since although Obvious used an algorithm that could produce thousands of paintings in minutes, in a specific instance in time, they chose these eleven portraits to be made into a work they deemed artful. And although we have established the fact that the AI did not produce the paintings autonomously, but was a mere means to an end, the consequent decisions made by Obvious, the discourse they framed the work with, as well as the final portraits selected as a satisfactory match to the aesthetic result they expected -or would be convincing enough for a wider audience - as well as the decision to sign the work with a formula instead of their name, all indicate intentionality that can still not be found in machine intelligence.

What perhaps clearly distinguishes Obvious as authors of the final work despite the misappropriation and the misrepresentation of the medium used, is precisely this misappropriation and representation that further established their intention as their own instead of other artists that work with the same medium and perhaps the same open-source algorithm.

Hugo Caselles-Dupré, Pierre Fautrel and Gauthier Vernier as Obvious, made a choice that could or could not be considered artistic depending on our individual vision of what Art should do and

¹²² Lewitt, Sol. *Paragraphs on Conceptual Art*, in Stiles and Selz, *Theories and Documents of Contemporary Art* University of California Press, 1996 p. 825.

which ethics it can disturb in the process. Either as a means to pay tribute to important technological advancements of our times, or as in their words put to “democratize AI art”, the collective co-created the portraits with a borrowed algorithm. In the view of this research, they have unintentionally made an institutional critique by actively becoming part of it, which makes the Belamy portraits a symbol for the decadence of the state of the market. Possibly, if it were intentional it could stand alongside Banksy’s “self-destructed” painting stunt in October 2018, which after being sold for more than 1 million pounds in a Sotheby’s auction, it shredded. The anonymous street-artist stunt was an incident that was presented as a performance by some according to press coverage:

Banksy upstaged London’s busiest art week on Friday evening, when a version of his famous artwork *Girl With a Balloon* self-destructed just as it hammered for \$1.4 million at Sotheby’s. While onlookers appeared shocked by the incident, staff were quickly on hand to move the framed and partially shredded work backstage.¹²³ (Rea & Pes, 2018)

Either way, we can safely assume that the shredder built inside the frame was not the artist of the painting’s “performance” any more than the AI was for the Belamy family portrait series.

¹²³ Rea, Naomi and Javier Pes, “After Banksy’s Viral Auction Stunt, Other Collectors Wonder If Shredding Their Own Works Will Increase Their Value”, *Artnet News*, Published: October 8, 2018, Accessed: Apr 3, 2019

6. Conclusion

Having reviewed the various Artificial Intelligence related projects and discussed the different dimensions of the simulacrum of AI as an artist, this research comes to conclude on certain ideas and aspects that could perhaps best summarise the different viewpoints on the subject as previously explained. Indeed, the purpose of this research was to identify an author in artworks made with the assistance of a semi-autonomous technology like Artificial Intelligence but also pinpoint the critical risks in the coordinated effort to mask human design, intention and intervention for their completion.

Through the analysis of the case studies as well as the review of the theory linked to the subject, we could safely conclude that Artificial Intelligence is not an autonomous force created by an abstract idea. Algorithms and data are designed, collected and utilised by skilled individuals who specialise in computer science. Through elaborate processes and continuous experimentation, the technology evolves further and is tested on different applications including that of art, as technology has always done. In a very similar way to a brush, the algorithms will move towards the direction that they are taken by the command of the one who holds them, making it very clear that although tools become more functional, the line of authorship is still human.

Artificial Intelligence technologies signify exactly what the word technology means, a collection of techniques that can be used for the accomplishment of a certain objective. AI is a tool and not a person and can therefore not produce art independently as to do so, it would need to have feelings, thoughts and the clear intention to express them. However, Artificial Intelligence algorithms are designed to function in a certain manner by human minds with their own will and inspiration and although the technology is applicable to a variety of domains, without the creator's intention, it does not make art on its own.

Artists have used machines and technology for the completion of their crafts since antiquity, but the idea that technology could breed a human-like being has not been expressed prior to the emergence of Artificial Intelligence. In fact, if we wish to answer the question of who is the

author of an AI artwork, we first need to identify what makes the product art and consequently what makes its creator an artist. Throughout this dissertation we discussed a wide range of projects, some of which had clearly identified artists involved and others which promoted the idea of an artificial-generated creation acting independently. When we look closer to those initiatives, we can identify significant differences among the two with the former presenting truly creative applications of the technology in an artistic context and the latter mainly pursuing either to mislead the audience with the objective of financial gain or to increase a company's public approval.

Even though the question of what makes art good is highly complex and subjective, we could attempt to distinguish some of the artworks presented as more intrinsic than others taking into consideration primarily the clear identification of the artist and secondarily context. As far as the artistic projects mentioned, we cannot but admire works such as Anna's Riddler's blooming tulips for combining originality with context that allows us to focus on the art and not solely on the medium. With a clearly identified artist and intentions that expand further than research, her art seems to challenge the current market order of things, by bridging historical references with contemporary conditions. In particular Riddler's interpretation of the tulip mania phenomenon of the 17th century by the use of present-day cryptocurrency statistics makes for a spot-on reference on the occasional market booms of certain products that eventually wither and die. The continuous nature of the project, allows the viewer to perceive the work as "alive" and therefore highly relevant to its proper space and time.

Drawing their inspiration from historical references too, Klingemann's and Barqué-Duran's artificial muse performance allows us to reflect on the classical concept of the muse while witnessing the artist's attempt to question what has been established as a typical painting subject. The artists deconstruct the idea that the muse needs to be a human by exchanging the typical figure with an AI generated form which could perhaps become a reference for different subjects should one wish to go deeper. The AI product as described by Klingemann is a hybrid between what was humanly painted and what computer generated. Again, the performance has a clear

definition on who is the artist and the use of Artificial Intelligence is done in a way that blends into the narrative instead of being the only generative power.

Similarly to more artists who have utilised code as a tool and not as a purpose, such creative initiatives allow us to appreciate the medium's originality without losing track of the real people involved and their creative intentions. This is not the case however for the Belamy portrait series presented by the collective Obvious. In that case, although legitimised by the market with a spectacular price and arguably more press coverage than any other AI art initiative mentioned, Obvious attempted to idolise Artificial Intelligence and present the works as autonomously made. Along with the misappropriation of another artists code and original idea the Belamy project acts a symbol of the decadence of the arts market. Their financial success along with a lack of context merely highlight the insufficient criteria that maybe define prices among auction houses targeting collectors with the capacity to buy art but not necessarily a love for it.

Moving towards the projects in which companies were directly involved, through the close review of the initiatives and artworks analysed, we notice a pattern of development objectives that aim to make machines creative, original and arguably human. But further than the technology, what is perhaps most troubling is the fact that although AI has authors, they are masked under the label of automation. Same as with the Video Games case which was mentioned earlier, the software developers and designers are fully appropriated under the company identity. Companies as the controllers of the human capital, can present any outcome of their labour force without necessarily crediting the creators, marking the disappearance of the author under the brand's name.

Which brings us to the subject of the author's identity as a further legitimisation of the outcome. As Foucault suitably explained in his discourse, an author's name is more than a mere name but carries with it a particular identity which is linked to more than her or his works.

It is more than a gesture, a finger pointed at someone; it is, to a certain extent, the equivalent of a description. When we say 'Aristotle,' we are using a word that means one or a series of definite

descriptions of the type: 'the author of the Analytics,' or 'the founder of ontology,' and so forth. Furthermore, a proper name has other functions than that of signification: when we discover that Rimbaud has not written *La Chasse spirituelle*, we cannot maintain that the meaning of the proper name or this author's name has been altered. The proper name and the name of an author oscillate between the poles of description and designation, and, granting that they are linked to what they name, they are not totally determined either by their descriptive or designative functions.¹²⁴ (Foucault, 1998, p.209-210)

Although in Artificial Intelligence there is no human name, the technology has come to be identified with something flawless, reliable and smart which transforms it into a contemporary myth (cf. Barthes, 1957). In a way the artificial author demonstrates stronger and more profound references that are directly related to the popular culture representations and our distorted understanding of software structure. Which means that the promotion of AI in a more automated role than it is capable of, allows technology corporates to best market their mastery of Deep Learning and machine automation, and consequently increase their market value and public's trust in their products.

The institutionalisation of the individual identity in the case of artificial intelligence, as demonstrated by the corporations that sponsor its further development, entail in fact some significant risks that apply directly to AI as a massively accessible creative tool but also its overall usage in different formats and occasions. In particular the influence of the individual judgement on the functionality of a powerful algorithm means that the final output might carry particular prejudices that are embedded in the data selection and categorisation. As demonstrated with the examples of AI algorithms reproducing racial or gender stereotypes, the responsibility of creating an artificial intelligence that is objective and unbiased is significant.

Artist Stephanie Dinkins has been challenging the artificial intelligence data risks in her ongoing practice of recording conversations she has with a “social robot” named Bina 48. The project

¹²⁴ Foucault, Michel, and James D. Faubion. *Aesthetics, Method, and Epistemology*. New York: New Press, 1998, p.209-210

titled “Conversations with Bina48” aims to question artificial intelligence multicultural understanding while raising awareness on the subject of Machine Learning and invites audiences to reflect on where does the robot draw the “ideas” it expresses in its conversations with the artist.

A quest for friendship has turned into a rabbit-hole of questioning and examination of the codification of social, cultural and future histories at the intersection of technology, race, gender and social equity. [...] Thus far the two have discussed family, racism, faith, robot civil rights, loneliness, knowledge and Bina48’s concern for her robot friend that are treated more like lab rats than people. Their conversations have been alternately entertaining, frustrating for both robot and artist, laced with humor, surprising, philosophical and at times absurd.¹²⁵ (“Conversations with Bina48, n.d.)

Dinkins’ work although not using AI as a tool but as a subject expands to raising awareness, especially among communities of color on the algorithmic systems structure as well as concepts such as empathy and inclusion. As an undeniably more activist project, the artist’s clear identification as human addressing a machine that is physically modeled to resemble a person make us question who is the person behind each algorithm.

However, more than the objectives and the risks which are behind the use of Machine Learning and machine automation, it is worth looking at the art produced through such initiatives and whether it represents any of the capacities that machines cannot possibly replicate such as feeling, intent, curiosity and the need for expression.

The case for The Next Rembrandt, for instance, which was used as promotional material on behalf of the bank that financed it, eventually became a research project which could possibly, have an artistic aura, especially as it preserved the technique of an established artist and allows for the further comprehension and admiration of his work. In that case, the corporate patronage allowed for the development of a research that can prove valuable to heritage conservation and

¹²⁵ “Conversations with Bina48, Stephanie Dinkins, n.d. Accessed: Mar 20, 2019
<https://www.stephaniedinkins.com/conversations-with-bina48.html>

could be used for educational purposes. The painting itself, generated through the collective efforts of the stakeholders, also demonstrates some of the signs of an ordinary artwork. Whether that is its ability to steer thinking about the evolution of technology and the diachronicity of the painters impact, or provoke emotions of admiration towards the mastery of the medium while simultaneously offering a specific context to it being a tribute to an established painter.

Nevertheless, artworks produced under the abstract concept of AI as an automated tool of independent production, whether aesthetically pleasant or not, come with a certain problematic which does not allow us to effortlessly perceive it as art. That problematic is linked primarily to the “author” being more closely appointed to either a machine or a company, which is not the typical frame for an artist while intention since the machine has none. Yes, machines can make art but only as a product that is the outcome of a clearly identified human intention.

Indeed, in order for us to conclusively define who is the author of an artwork made with the use of AI, the primary difficulty that might prevent us from doing so is purely philosophical. Should we believe that from the moment it is created it becomes detached from its creator and can be viewed as an aesthetic product with no further “depth” or reasoning behind or must we look for human traces of intention and context? Our need for explanation, context and intention can significantly impact our view on how the works presented previously will be looked at.

Artist Agnes Martin attempted to paint abstract ideas in a way that was powered by feelings and not materials or medium. Her paintings could be easily reproduced by a machine as there does not seem to be much complexity in the structure that an advanced algorithm will not be able to overcome. Especially if AI has been able to reproduce Rembrandt’s masterful technique. But the AI itself cannot replicate neither the unique presence of the artwork in space and time nor Martin’s interpretation of what feelings look like. Taking for granted that Artificial Intelligence is not independent enough to produce anything as an expression of an emotion, its use as a medium by non artists attempts to solely act as a copy of human creativity as it has been demonstrated in a variety of means throughout the years.

Whether it requires photocopying a single blank piece of paper multiple times and seeing the image change as Ian Burn did for the creation of his “xerox book” (1968) or programming a computer to execute the painting for you like Harold Cohen, what is eventually transforming the book or the painting into art is not the machine, but the idea and the execution creating something new through the unique view of the artist. AI certainly allows for new potential in the field of art-making but its overall capacities are only beginning to be tested. As with previous forms of arts, the initial steps include the attempt for imitation of the world around it. There is no doubt that in the years to come scientific research and cognitive studies will produce algorithms with increased capacities and endless possibilities for innovative applications in many fields including that of the arts. Whether artists will leverage those new means for production depends largely on our critical perception of their overall role and the clear identification of which gap is art coming to fill in a world where reproduction is more skillful than ever before.

In the process of discovery of new tools for artistic expression, perhaps one of the biggest challenges will be to acknowledge creativity in fields that are typically not linked with humanities such as software creation and algorithmic design. Accepting the hybrid forms of art products to surprise us and perhaps foster reflection on contemporary technology standards could further widen the arts field which has historically allowed for misfits and unconventional thinkers to thrive and inspire change.

At the age of 86, Cohen received an achievement award for his lifetime contribution to the arts and in his acceptance speech he tackled perhaps the definitive answer for this dissertation:

[...] Another ten years on and I would have said the fact of the program doing this on its own is the central issue here, denoting my belief in the programs potential and growing autonomy over the whole business of art-making. But the truth is that while AARON was gaining independent control of an increasingly complex set of strategies, it wasn't actually becoming any more autonomous at all. How is that possible? It was producing complex images of a high quality and could have had it go on forever without rewriting a single line of code. How much more

autonomous than that can one get? Well of course, that's exactly the point. It's virtually impossible to imagine a human being in a similar position. The human artist is modified in the act of making art. For the program to have been similarly self-modifying, would have required not merely that it be capable of assessing its own output but that it had its own modifiable worldview, to provide a basis for any meaningful assessment.[...] Eventually, it became clear to me that the most complex computer program in existence, is so many orders of magnitude less complex than the mind of a human being. Perhaps especially the human mind engaged in making art or literature.¹²⁶ ("ACM SIGGRAPH Awards - Harold Cohen, Distinguished Artist Award for Lifetime Achievement", 2014)

Cohen's remarks are drawn from his long term experience of producing art with the assistance of a semi-automated machine that could produce art indefinitely should his creator wish to. His final argument regarding the debate on whether a machine can make art and if the author can ever become an insignificant factor for the final outcome, leads us to a conclusion aligned with the classical view that brings the artist in the center along with her or his creation.

To conclude, the human mind remains largely unmapped both in terms of the broadness of its intellectual products as well as in their originality and quality. In a way quite similar to the human soul, which is the source of feelings that become the matrix for all artistic creations. The know-how that makes mental and emotional products tangible can use any method or technique, but those can never substitute the human being as unique creative force. Their role remains complimentary.

¹²⁶ ACM SIGGRAPH Awards - Harold Cohen, Distinguished Artist Award for Lifetime Achievement, YouTube video, 22:23, from the acceptance talk for the 2014 of the Distinguished Artist Award for Lifetime Achievement in Digital Arts, posted by "ACM SIGGRAPH" August 22, 2014,

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