Chapter 15
Human Authorship and Art Created by Artificial Intelligence – Where Do We Stand?

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> "We must expect great innovations to transform the entire technique of the arts, thereby affecting artistic invention itself and perhaps even bringing about an amazing change in our very notion of art".[1]

I. Introductory Note

Art as an expression of technique, art as a display of sentiment: there is no need to be an art connoisseur to evoke how often these two descriptions have been opposed. Law as culture and law as a tool for social engineering: these two narratives partake, as well, in a long intellectual history, although less known to the wider public. Those more focused on tools and techniques share an aspiration for global uniform regulations, while those keen on cultures and emotions manifest a preference for *ad hoc* local regulations. This tension between a favour for a global harmonization of rules and a deference to cultural diversities also affects copyright laws. As is well known, an age-old cultural and political difference between the French inspired and Anglo-American copyright laws has not completely been understood. Authors and their works still receive, in some regards, and despite international conventions, different treatment depending on the jurisdiction.

Today, we observe new regulatory approaches arising from technology such as the emergent Artificial Intelligence (AI)-generated art. Since the 70s, computers have been used to create imaginative works such as poetry, paintings, and musical compositions. Most of those computer-made *oeuvres* derived from the programmer's inputs, while the machine was simply an instrument, like a brush or a camera. While this perception persists

1 Paul Valéry, *Pièces Sur L'art. La Conquête de l'ubiquité* (1928), quoted by Walter Benjamin as epigraph to his *The Work of Art in the Age of Mechanical Reproduction*, 1935.

today, we are also facing a dramatic technological change which grants us the opportunity to re-evaluate the role played by processors in the creative course.

When computers were considered as nothing more than a tool, legal provisions were applied accordingly. Most of today's AI-driven mechanisms however, develop algorithms through machine learning. The incremental separation of machines from humans brings a new challenge to an established set of provisions of law and arts. When confronted with new challenges brought in by AI-generated works, the law appears wanting. Globally, most commentators refer to the letter of the law, where a "human factor" seems to be an inescapable requirement of copyright authorship. Others minimise the matter, noting the scarcity of judicial cases where AI-generated art is at stake.

In my opinion, the debate on the impact of AI on copyright laws is significant and should not be postponed, based on a pretext of immaturity, if not irrelevance, of the topic. It is significant at least for the following reasons: AI-driven systems and the artworks that they produce nurture policy issues that affect copyright ownership entitlements and legal protection of artists, researchers, engineers who are experimenting in the field. Also, AI-generated creations question the dynamics among art producers, artworks, and the public. The aim of this essay is to indicate that this matter is incumbent and relevant for both international and national legal regimes of regulating art production.

II. A New Agenda for Copyright Laws

Imagination, creativity, and therefore, the making of art are abilities peculiar to human intelligence, and vibrant marks of humankind. Among the three, imagination precedes creativity in the development of human consciousness, while creativity may, but not necessarily does, reflects itself in a product. A product can be a tool, a tale, and even, an artwork. Initially, the law paid little attention to such creativity. Indeed, both the production and trade of its results were regulated by two main areas of private law: property and contract. Eventually, creativity was perceived as an important driver of human progress. This perception led to the first copyright regimes being established in the 18th century.

Today, the so-called 4th revolution[2] is boosted by the development of machine learning[3] and deep learning software which allows autonomous systems to learn and execute outputs without being explicitly instructed by human beings. While arguing that the traditional copyright laws are inadequate to cope with new technology involved in creating artworks, Shlomit Yanisky-Ravid contends that *oeuvres* autonomously generated by machines challenge a basic tenet of copyright law, namely that only humans can create works: "Copyright laws are simply ill-equipped to accommodate this tech-revolution and are therefore unlikely to survive in their current form. In order to address the change in the way art is being created, we must either rethink these laws, give them new meaning, or be ready to replace them".[4] Clearly, AI-generated creations raise a number of copyright questions.

Firstly, the development outlined above has occurred in parallel with a continuous evolution of data mining technology. Further, widened access to all types of data also represents a set of multiple challenges to "classic copyright regulations"[5]. Training an algorithm may require the use of images, texts, or other data. Artworks used to train can be in open source, in the public domain, or protected. While it would not be easy to determine which works have been effectively used in the training process, one wonders whether a claim for copyright infringement of protected works would be successful. Secondly, the programmer could sell the algorithm's code as a work in itself. Thirdly, from a different, but altogether relevant, perspective, AI-generated art raises the issue of preserving algorithms.[6] Their fast deprecation has even encouraged some artists to qualify their output as temporary performances rather than paintings or videos.[7] Fourthly, authorship is concerned whenever an AI system, being dependent on the

2 See Floridi (2014).

3 "Machine learning" is a branch of artificial intelligence based on the idea that systems can learn from data, identify patterns and make decisions with minimal human intervention. "Deep learning" is a type of machine learning that trains a computer to perform human-like tasks, such as recognizing speech, identifying images or making predictions. See Thoma (2016).

4 Yanisky-Ravid (2017); see also Bridy (2012) 5.

5 When using the expression "classic copyright regulations", I refer to the body of enactments adopted in the course of the 19th and the 20th century, both at the level of national and supranational law. Being "classic", these enactments are, at times, challenged by new artistic actions.

6 The business practice of recurrently updating software frameworks can make trained neural network models obsolete over time.

7 Gaskin (2018), quoting artist Harshit Agrawal.

learning algorithm, is capable of making combinations that are increasingly autonomous from the original set of materials provided by the programmer. When the deterministic nature of software becomes a probabilistic process, we observe a qualitative leap that cannot be explained by the metaphor of the "brush and tool". All these issues have legal implications that are not clearly covered by current copyright regulations.

In this work I explore the fourth issue which deals with the ontological nature of AI-generated creations which challenge classical copyright law concepts, namely authorship and originality.

Today, computers produce artistic or innovative outputs. These programs, however, should not be considered as either "able" or "not able" to autonomously produce works.[8] Rather, there is a continuum linking, at one extreme, 'computer-assisted' works and, at the other extreme, autonomously generated works. The middle of the continuum is broad and includes methods with varying grades of human intervention. Depending on the degree of human intervention, the form of the output may be minimally, significantly, or substantially determined by software. And while for computer-assisted works the software is a production device, for *autonomously generated works* the outcome may be unpredictable.[9]

These outcomes become an epistemological case. Their legal status is uncertain and depends on our attitude towards the degree of autonomy from humans that machines "enjoy".[10] Already, we appreciate "e-David" and "Paul," robots capable of drawing portraits in the inventive style of Patrick Tresset, their artist programmer.[11] More than merely copying machines, Tresset's robots are fitted with an "autonomous artistic creativity" that makes them capable of producing "objects that are considered as artworks".[12] Indeed, those following contemporary art updates know that a "generative adversarial network" (GAN)[13], having ref-

8 See: Sawyer (2012) 143 et seq.

9 For an early account see Dreier (1992).

10 See Thaler (1996).

11 E-David takes pictures autonomously with its camera and draws original paintings from the snapshots. By using different techniques, it makes "autonomous and unpredictable decisions about the image, the shapes and colors, the match of lights and shadows"; see Yanisky-Ravid (2017) 669.

12 See Hodgkins (2016).

13 A generative adversarial network (GAN) is a machine learning model, invented by Ian Goodfellow in 2014, in which two neural networks compete with each other to become more accurate in their predictions. GANs typically run unsupervised. See Gatys/Ecker/Bethge (2015) 2.

erenced 15,000 portraits from various centuries, had painted on canvas a *Portrait of Edmond Belamy*.[14] The work, signed at the bottom right with $\min_G \max_D E_x\left[log\left(D\left(x\right)\right)\right] + E_z\left[log\left(1 - D\left(G\left(z\right)\right)\right)\right]$, namely part of the algorithm code that produced it, was presented at a Christie's auction.

The *Paul*-originated paintings have been exhibited in major art museums and acquired by galleries, museums, and art fairs for display, while the *Edmond Belamy* portrait was sold for 432.000 USD.

These examples, among others, evidence that questioning the nature of an artwork produced by automatic systems is not a pursuit confined within a purely theoretical debate. The existence of these works, and in particular, their appearance in the art world, forces us to understand their place within copyright regulation, as well as the art world.

III. AI-Generated Art and Creativity

Countless descriptions have been associated with the concept of "creativity". It can be "weak" or "strong", "exploratory" or "transformational", and additionally, "4th dimensional". A model of creativity devised by Mihály Csikszentmihályi[15] includes three interrelated elements:

- an accepted, and agreed upon, domain of current knowledge;
- an agent who alters a component of the domain to produce something novel; and
- a field of experts that ultimately decide whether the novelty will be accepted into the existing domain.

Kyle Jennings has identified three criteria for an agent to qualify a system featuring creative autonomy:

- autonomous evaluation (the system can evaluate its acceptance of a creation without seeking opinions from an outside source);[16]

14 Christie's (2018).

15 Csikszentmihályi (1988).

16 The following definitions are provided by Jennings (2010): "autonomous evaluation requires that the system be able to issue opinions without consulting an outside human or machine intelligence. However, the system is free to ask for or observe others' opinions at other times, and to store this information".

- autonomous change (the system initiates and guides variation to its standards without being explicitly directed when and how to do so); and
- non-randomness (the system's evaluations and standard changes are not purely random).[17]

Applying these criteria to AI means that "[...] progress[ing] from a capable apprentice to a creator in its own right, an AI system must be able to both independently apply and independently change the standards it uses. This ideal will be called 'creative autonomy,' and represents the system's freedom to pursue a course independent of its programmer's or operator's intentions".[18] Following these approaches, an author is not the lone component of the creative process. Nor does creativity exist independently in any of the listed elements. Rather, creativity depends on individual capacity, acquisition of information and judgment by experts.

This perspective can free AI-systems from the identification of "autonomy" as a state of complete segregation. Kyle Jennings' argument logically supports the recognition of a truly independent AI system as one where transformational (and not pure exploratory) creativity emerges out of interactions among many different agents. In such an environment, machine learning may enable an AI system to change its preferences not randomly, but as a reaction to continuously collected evaluations and opinions.[19] Also, an AI system may attain experience from the senses. For example, AI painters have shown that AI paintings can be influenced by sounds, lights and temperature in the environment, or even keywords that the system autonomously chooses.[20]

In its purest appearance, creativity may lead to ingenious works which challenge standards and canons and ultimately produce unconventional art. "Unconventional" is the appropriate word, as it means deviating from conventional canons. But is AI-generated art unconventional? Indeed, it is one thing to reproduce a painting from the digestion of thousands of similar artworks, and it is another to produce unusual works, marked by a new style.

Ahmed Elgammal, the director of the Art and Artificial Intelligence Laboratory at Rutgers University, built upon the development of GAN

17 Jennings (2010) 490.
18 Ibid. 491.
19 Ibid. 499.
20 Moss (2015).

systems to establish the creative adversarial network (CAN).[21] This system is specifically programmed to produce originality and creates images which differ from those collected. In this case, the images consisted of paintings from the 14th century onwards in all styles. Generally, works produced through a CAN system have received appreciation in the art world. Important auction houses in particular, have introduced these *oeuvres* into international visual art markets. CAN systems stretch across two extremes: the innovative capacity of AI-made works to depart from established canons, and the ability to produce *oeuvres* that are not foreseeable by the algorithm's designer. One algorithm creates a solution, the other judges it, and the system loops back and forth until the intended result is reached. The innovative aspect is that the generator is informed to produce an image that the discriminator recognises as "art", but which does not fall into any of the existing styles.

If humans do not trigger the action taken by an automatic system, nor partake at the end of the process by supplying sufficient "intellectual creation" to match the minimum standard of authorship requested by the Berne Convention for the Protection of Literary and Artistic Works, one might well consider these outputs to be "autonomously computer-generated".

IV. AI-Made Art and the Law

Let us assume, then, that an *oeuvre* is produced via an independent AI process, free from human intervention in the making. What would its legal status be?

According to most authors, copyright law is not currently structured to accommodate the innovative authorship frame of "people-who-write-programs-that-make-art".[22] This position can be read in two different ways. Firstly, whether innovative authorship leads to the recognition of authorship for programs-that make-art. Secondly, whether a conservative approach would be adopted to maintain that copyright should only grant "human authorial rights".

The latest generation of AI systems makes it difficult to understand where the programmer's contribution ends and the user's role begins. This becomes even more confusing when the program is coded to produce

21 Elgammal (2017).
22 See Zemer (2006) and (2016).

expressive choices independent of both the programmer and user. Indeed, perhaps the challenge AI brings to copyright law is so robust it necessitates a change of perspective regarding authorship requirements.

Such a change would undoubtedly challenge classic copyright law which focuses on the position of the author. Despite numerous position papers, white papers, governmental reports and recommendations,[23] national lawmakers have not yet addressed the subject. This is unsurprising, as most policymakers view such regulation as premature. In their opinion, existing copyright laws can respond, at both national and international level, to the challenges brought into the system by AI-generated artworks.

In my view, this position holds so long as one maintains that artworks produced by machines are *derived* from human action. Until recently, it was a common belief that a machine, though defined as "intelligent", lacked the "creative aptitude" to produce artworks. Indeed, it is well known that the law in many countries only protects "original" works created by human intelligence. "Until recently", I said. However, today many new projects attest that it is not worth condemning the matter as simply irrelevant.

The 1886 Berne Convention failed to define authorship because it was generally acknowledged thatthe term "author" implies a human element. In the United States it is more explicit as the Federal Copyright Office declared that it will "register an original work of authorship, provided that the work was created by a human being".[24] This statement originates from Feist Publications vs. Rural Telephone Service Company Inc.[25] In this case, the court ruled that copyright law only protects "the fruits of intellectual labour" that "are founded in the creative powers of the mind." Within the European Union, the Court of Justice has ruled several times that copyright only applies to *original* works, and that originality must reflect the "author's own intellectual creation".[26] Likewise, EU Member States national laws imply, more or less explicitly, that the "human factor" is the prerequisite to provide copyright protection to authors.

UK law deserves a special note, as its copyright legislation contains specific provisions dealing with computer-generated works. According to

23 See, e.g., French Ministère de l'enseignement supérieur (2017); UK Science and Technology Committee of the House of Commons (2016); U.S. National Science and Technology Council-Subcommittee on Machine Learning and Artificial Intelligence (2016).

24 U.S. Copyright Office (2017) § 306.

25 499 U.S. 340 (1991).

26 ECJ, case C-5/08 of 16 July 2009 – Infopaq.

Sec. 178 of the UK Copyright Designs and Patent Act (CDPA, 1988), a computer-generated work is defined as "a work that is generated by a computer such that there is no human author". Under s. 9.3 of the same CDPA authorship of such work is "given to the person by whom the arrangements necessary for the creation of the work are undertaken". However, this legislation is a legal fiction set to solve the authorship dilemma of AI works on the belief that the computer is merely a tool. Clearly, "the person responsible for making such arrangements is not the true author under copyright law, as evidenced by s. 9.1 CDPA".[27] The more removed AI is from human interference, the less likely authorship will be granted due to the lack of human intervention. British and similar legislation adopted in other common law jurisdictions do not seem to be a workable solution to this dilemma. Even if it is viable for AI systems which are not autonomous, the identity of the "person responsible for the arrangements" remains unclear.

The problem compounds when the automatically generated output cannot be traced back to any human action or interference. According to existent copyright regulations, an AI independently generated work will not be recognized as an "artwork" in the sense of copyright law and, therefore, will not be subject to the legal protection provided by copyright privileges. In other words, so long as the process is recognised by the law as driven by a human agent and the result of a human mind, the law will be adapted to follow suit and grant humans copyright. However, when technology advances to the extent that it is difficult to recognize the "person making the arrangements for the work", there is a legal vacuum. The challenge cannot be solved by implementing minimal amendments to copyright law. Rather, we should understand that inertia or minimal adjustment will not make up for the uncertainties originated in the copyright systems by AI. This vacuum will generate confusion and judicial irresolution.

In fact, this legal dilemma revolves around two options:

- a strict reading of copyright law: if there is no way to provide protection, then the law does not intend to protect AI generated works. This option will result in leaving AI generated artworks in the public domain;[28] or

27 Denicola (2016).
28 See Ramalho (2017).

- assigning the title and related protections by choosing one or more privileged holders, such as the *programmer*[29] or the *user*.[30]

The "human factor", then, remains the centre of the analysis.

Its permanence, however, has not prevented a flourishing of proposals to find a way out of the maze of lacking legal regulations and outdated normative theories, to adjust copyright laws to the advancement of technology. Among those proposals, the most challenging are the ones addressed to consider "AI-driven non-human agents" as potential subjects of law, as well as those developing new theories within the law of robots.[31] Colin Davies contends that "a corporate body has under UK law legal recognition as an individual." Therefore, "a computer which is more akin to a true person, more particularly with the new generation of artificial intelligent computers, should be accorded the same status. This will enable us to attribute authorship of computer-generated works/inventions to the body best entitled to them, the computer, and allow the respective claims of interested parties to be determined not by arbitrary rules of law, but by the parties themselves, through negotiated contractual terms. Revolutionary this may be, but no more so than granting intellectual property rights, as we currently do, to a body corporate".[32]

V. AI-Made Art and the Art World

So far, I have looked at the law. A restrictive reading suggests that whenever there is not a human author, there is no copyright protection. Therefore, whenever new generation AI-machines autonomously produce *oeuvres* without human interference, these works are in the public domain. Lacking a clear identification of an author, copyright law excludes these works from protection.

Let us now shift our attention from the *subject* to the *object*. Non-human intelligent agents, not qualified by the law as "authors", can independently produce works remarkable by their aesthetical impact. Whether those works can be qualified as "artworks" depends, sometimes, on the law,

29 A *programmer* (also called *coder*) is an individual that writes computer software or applications by giving the computer specific programming instructions.
30 *Users* are the people (or other systems) for whom the software is written.
31 See Pagallo (2013) 155–181.
32 Davies (2011) 618.

but particularly on the *art world*.[33] In fact, an artwork is not only what is defined by the law.[34] As art historians have repeatedly proven, the art world is able to recognize works that escape any legal classification. AI undeniably pushes to the forefront an understanding of art where the social network[35] related to the artistic practice does not involve an author in a traditional, human sense. The outputs of AI may very well be of such a quality that they can sustain enjoyable appreciation in ways that are not dissimilar from those found in more traditional art *genres*.

This happens despite the inability of copyright law to resolve the authorship dilemma. The structure of traditional copyright law, from its property law origins, is not designed to trace situations where authors, artworks, and users blur. This has already been proven by contemporary visual arts, which brought quite several challenges to copyright law.

Views differ on the relationship between human and not-human agents. This stems from a discussion emerging in the literature on the identification of an AI-operated machines as "owners" of generated works. This option – supported by some scholars – grants an artificial intelligent agent legal personhood but does not necessarily imply a recognition of authorship. This view has been developed most clearly by Gabriel Hallevy who advocates the recognition of legal personality for AI operated machines.[36] Recent literature suggests that autonomy, creativity, and advancement of AI systems should lead to their recognition as independent subjects vested with limited patrimonial rights and duties.[37] As stated by Yanisky-Ravid, "the corporation as a legal entity can serve as a basis for imposing rights and duties on AI systems. Corporations are legal entities subject to a legal regime, including corporate, labor, and even criminal law. Therefore, the question relating to AI entities has become 'does the growing intelligence of AI entities subject them, as any other legal entity, to legal social control?'".[38]

However, advocating a legal status for intelligent machines – although discussed at both the *political* and *legal* level – remains a proposal confined within a limited circle of proponents. The main counterargument is well known: the law acknowledges personality for corporations in all legal systems, but corporations are constituted by human beings. The traditional

33 On Arthur Danto and the art world see Andina (2017).
34 Duboff (1990).
35 See McIver Lopes (2017) and (2009).
36 Hallevy (2012) 211.
37 Chopra/White (2011) 1–3.
38 Yanisky-Ravid (2017) 670; see also Weaver (2014) 3 et seq.

paradigm is based on the idea that humans are "behind" legal entities and corporations. This criticism still holds true, at least for EU institutions where no reform agenda is clear. On 12 February 2019 the European Parliament adopted a Resolution on a comprehensive European industrial policy on artificial intelligence (AI) and robotics.[39] After describing AI as "one of the strategic technologies of the 21st century", the European Parliament presented several recommendations to the Member States, advocating "human-centric technology," to avoid the possible misuse of AI technologies to the detriment of fundamental human rights. The European Parliament insisted on the predominance of the human factor over computer systems based on "the 'man operates machine' principle of responsibility," and recommend[ed] that "humans must always be ultimately responsible for decision-making".[40]

As a set of Russian dolls, the human factor re-emerges from every notion, be it authorship, originality, or creativity. As the human factor is founded in classical copyright law, the latter influences any possible interpretation internal to the legal discourse. We must, therefore, accept that the legal interpretation is not ready to abandon its classical foundation. At the same time, we should also acknowledge that classical law is crippled by the advancement of new technologies, and in particular by the newly AI-autonomously generated *oeuvres*.

VI. Concluding Remarks

Advancements in technology and the last generation of autonomous AI systems are posing a new challenge to the legal regime of authorship. Neither interpretation nor simple adjustments of existing laws seem to be a proper response. For the first, time we experience a manner of making art which assumes the non-existence of a human author. Lacking an adequate understanding of the scale and perspectives of these advancements, it is likely that, while the art world is embracing AI-generated artworks, its legal counterpart remains unresponsive.

This contribution aimed to offer a view on the phenomenon of AI-made art, and to observe how it can be accommodated within copyright law. I have distinguished between different kinds of AI-generated *oeuvres*. Some cases, to be accurate, do not really challenge current laws. Whenever a

39 2018/2088 (INI).
40 Ibid.

human intervention can be detected in the creative process, an AI system remains a tool, a sophisticated tool, but a tool, nonetheless. And according to existing copyright laws, even a modest contribution is sufficient to recognize originality. An analogous solution applies whenever the artwork is independently created by the AI, but the human intervention consists in a selection of what has been made. In such cases the law is clear in recognizing human authorship as the act of selecting and choosing is traditionally viewed as subsisting of copyright. Beyond those instances, a remaining issue is whether a work *autonomously* generated and selected by an AI program, absent whatsoever human involvement, can subsist of copyright. In this case, different arguments lead to the conclusion that the current law is not helpful. Yet, the lack of regulation does not necessarily mean that such works lack qualification as an artwork. It rather means there is an absence of legal protection.

To make up for this deficiency, several authors from different research fields have elaborated a great array of proposals.

As we have seen, the first of these solutions follows the logic of the structure of copyright law. According to this approach, works without protection would simply fall into the public domain. AI-independently-made works in the public domain would be free to be used by everyone. However, identifying authorship in the case of works crafted by an indistinct merging of human and machine contributions may be problematic. This would lead to a detrimental uncertainty in the legal protection of those instances. Also, one can imagine potential conflicts between individuals claiming authorial rights on the artwork and other parties interested in upholding the public domain. Moreover, while the default solution based on public domain is possible in civil law countries, it would be difficult in common law jurisdictions where regulations are based on the legal fiction of "the person making the arrangements for the work". This would result in a divergent approach between civil and common law jurisdictions regarding the treatment of AI-made works. Additionally, there could be a conflict regarding authorship based on the principle of non-discrimination when a person with an interest in an AI-generated artwork contends that a work of art created by an AI system should receive protection despite not being made by a human. The decision of a court in such a case would depend on the approach to the concept of originality adopted. The supposed simplicity of the public domain option would not stand up to those reservations.

Other legal mechanisms devised by some commentators, such as the extension of the "work made for hire" doctrine, or the extension of the norms on protection of "previously unpublished works", share, in my opinion, a

critical point. They are all based on fragile legal fictions which were intended for completely different circumstances. Also, they cannot be easily transferred from a common law environment into a civil law legal order.

Those who are not persuaded by the public domain option, nor by thorny adjustments of current regulations, could consider solutions which reflect the allocation of rights to individual(s) playing a role in the AI process, such as the programmer and/or the user. As mentioned previously, those solutions suffer from serious uncertainties on the actual determination of personal contributions.

We are finally left with the most radical option, to recognize AI-generative systems as such entitlement to their autonomously produced artworks *de lege ferenda*. While this would correspond with some projects already developed and accepted by the art world, from a purely legal perspective it would entail not only a technical, but also a "cultural revolution" within classical copyright law. This is not to deny that the time to rethink classical copyright law is here. Rather, that we should recognize that vesting AI systems with legal personhood is not a minimal action to be taken, as it infers legal changes in other areas of the law and not only in copyright regulations.

The existence of autonomous AI processes is today, a fact. As such, it deserves focused attention and should, in my opinion, to be treated in the framework of the wider debate on a future "law of robots".

Art production is not detached from the technological process.[41] It has never been, from painters developing new ways to make pastels, to the invention of cameras and videos. The advent of AI driven agents cannot be treated as a simple quantitative upgrade in technology, as it affects the core of the relationship between art and law: authorship and originality. This is the message sent by the art world sent to legislators and policy makers. It is apparent that policy makers responded to the invitation from the EU Parliament to the Commission to design a legal frame for assigning a limited personhood to AI systems poorly. The lack of success of this response reveals that, at least within Europe, policy makers are far from convinced from legislating a functional and adaptive legal framework for the various types of artificial intelligence. Still, the case should be reconsidered at the EU level, to prevent further divergence among national legislation.

In my view, the case of authorship in AI autonomously generated art – already considered by the art world – should find its way within the wider framework of the law of (and for) robots.

41 See Ferraris (2019) 5 et seq.

In the meantime, rather than developing fragile legal fictions built on elements of company or copyright law designed with differing aims, the legal world should develop contractual models. Whenever the current law does not fit the needs of our human communities, contracts have proved to be the best adaptable, flexible, and specific remedy to gaps in legislation. Agreements could determine, case by case, how to allocate privileges and rights, and how to distinguish the contribution of every participant. Additionally, whenever human involvement is not detectable, contracts could grant legal significance to the inventiveness of the AI designers. Within Europe, scholars and experts, judicial courts, EU institutions have already begun adapting the law of contracts to resolve this lacuna. As a result, new areas of conventional relationships have been established, mostly based on agreed commitments to share rights, and allocate privileges, to increase information for the benefit of the parties and the general public. However, it is said that the art world does not warm to the idea of contracting as a remedy.[42] This is certainly true. AI-generated art, however, occurs within a different environment, where know-how and financial investments in technology favour the recourse to voluntary agreements. Contracts and agreements among "non-authors" could provide some predictability while waiting for law to regulate the creative works produced by the art world.

To reach that point, however, a cultural change is needed: a change that innovators in art-generating AI cannot attain on their own, but that will be eventually caused by more robust policy concerns prompted by advancements in robots' capacity to sense, to think, and to act.

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42 John Merryman rightly noted: "In the artworld, the word 'contract' is a red flag. People react emotionally and irrationally to it"; Merryman/Elsen/Urice (2007) 852.

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