



## Université de Liège

European law, (big) data and artificial intelligence applications  
seminar (DROI1357A)

# Copyright protection of artificially-generated artworks

*Should artificially-generated works of art be copyrightable (de  
lege ferenda, the law as it should be)?*

Authors:

Iván Pérez Longa, Valentin Belva and Quentin Louis

Tutor: Clément Margaux

Course instructor: GROZDANOVSKI Ljupcho

2022-2023

First session

---

# Contents

<b>1</b>	<b>Introduction</b>	<b>2</b>
<b>2</b>	<b>Legal treatment of AI</b>	<b>2</b>
2.1	Definition of the European commission: .....	2
2.2	What is a work of art and how to protect it? .....	2
2.3	Description of the current legal framework .....	3
<b>3</b>	<b>Creativity</b>	<b>3</b>
3.1	Measure creativity .....	4
3.2	Human factor .....	4
3.3	CJUE definition of originality .....	5
3.4	Can an AI express originality? .....	6
3.5	Can an agent/user express originality through an AI ? .....	6
<b>4</b>	<b>Technical view</b>	<b>8</b>
4.1	Preliminary considerations .....	8
4.1.1	Generative and Discriminative Algorithms .....	8
4.1.2	Unsupervised Learning .....	8
4.2	Generative Adversarial Network .....	9
4.2.1	Definition .....	9
4.2.2	Types.....	10
<b>5</b>	<b>Ethical approach</b>	<b>10</b>
5.1	Photography and AI .....	10
5.2	AI as a tool .....	12
5.3	Legal personality - The monkey Naruto .....	12
<b>6</b>	<b>Last points</b>	<b>14</b>
6.1	Conclusion .....	14
<b>7</b>	<b>Glossary</b>	<b>15</b>
<b>8</b>	<b>Bibliography</b>	<b>16</b>

---

# 1 Introduction

Numerous debates have erupted with the arrival of Artificial Intelligence (AI) in art. This event has generated confrontation, and it is normal every day to see disparate opinions and discussions between artists and those interested in the subject on social networks. It is obvious that the world does not stop turning, and with the new boom in technology we are approaching a drastic change in the way we understand not only art, but also subjects as disparate as language or driving. Thus, in this paper we will first describe the current legal framework surrounding AI, insisting on the part of originality, then address the technical aspects of it, and end with ethical considerations and fears. All this in order to answer the question: "Should artificially-generated works of art be copyrightable?".

## 2 Legal treatment of AI

The main course of this paper is to determine if protection should be applied to artistic work created by an AI and if one should be applied, which one? First, few question arise to clarify the situation and clearly delimitate the ground of research. What do we consider as an AI? We have various definitions in the legal/political world of the AI.

### 2.1 Definition of the European Commission:

"Artificial Intelligence (AI) refers to systems that display intelligent behaviour by analysing their environment and taking actions – with some degree of autonomy – to achieve specific goals. AI- based systems can be purely software-based, acting in the virtual world (e.g. voice assistants, image analysis software, search engines, speech and face recognition systems) or AI can be embedded in hardware devices (e.g. advanced robots, autonomous cars, drones or Internet of Things applications)." <sup>1</sup>

### 2.2 What is a work of art and how to protect it?

Work of art is a notion that reminds "The literary and artistic work" in the Bern Convention of 1886, in which they define literary and artistic work as the expression "literary and artistic works" shall include every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression, such as books, pamphlets and other writings; lectures, addresses, sermons and other works of the same nature; dramatic or dramaticomusical works; choreographic works and entertainments in dumb show; musical compositions with or without words; cinematographic works to which are assimilated works expressed by a process analogous to cinematography; works of drawing, painting, architecture, sculpture, engraving and lithography; photographic works to which are assimilated works expressed by a process

<sup>1</sup> High-level expert group on artificial intelligence, "a definition of ai: Main capabilities and scientific disciplines" december 2018. 2018

---

analogous to photography; works of applied art; illustrations, maps, plans, sketches and three-dimensional works relative to geography, topography, architecture or science <sup>2</sup>.

This definition excludes all kinds of Intellectual property such as trademark, Patent, etc. We now have a delimited matter and a narrow subject. The next step in order to have a panoramic view of our subject is to analyse the actual legal protection offered to “classic” literary and artistic work. That is why we will discuss the Bern convention in detail, indeed the Bern Convention (1886) is the international legal basis concerning the protection of literary and artistic work.

Not all the productions such as books, painting etc can be protected by copyright. For a work of art to be copyrightable, it requires a certain “originality”. The big issue with the Bern convention is that there is no definition of originality. That is quite surprising because it is the one and only condition required to obtain protection for a work of art expressed in form (meaning the idea itself is not copyrightable). The jurisprudence had to define the originality and we will discuss this definition later.

## **2.3 Description of the current legal framework**

The Bern Convention is based on 3 guidelines:

1. National treatment (Work originating in one of the contracting States, must be given the same protection in each of the other contracting States as the works of its own nationals)
2. Automatic protection (no formality required)
3. Independence of protection (Prot. Is independent of the existence of protection in the country of origin of the work) <sup>3</sup>.

One of the main benefits of the Bern Convention is the automatic protection granted to any work of art.

## **3 Creativity**

Leaving aside this computer terminology, let’s now move on to a more abstract question: creativity. Searching the Internet, we can easily find an infinite number of articles, studies and opinions on the relationship between AI and culture <sup>4</sup>.

One of the most fascinating questions is the debate as to whether AI systems are the authors of the artworks they generate, or whether they are tools made available to humans to facilitate

<sup>2</sup> Berne convention for the protection of literary and artistic works, Paris act of July 24, 1971, as amended on september 28, 19

<sup>3</sup>Summary of the berne convention for the protection of literary and artistic works (1886)”, world intellectual property organization, [https://www.wipo.int/treaties/en/ip/berne/summaryberne.html\(consultedon13.11.22\)](https://www.wipo.int/treaties/en/ip/berne/summaryberne.html(consultedon13.11.22))

<sup>4</sup> LKmonljen. Inteligencia artificial, humanismo y algoritmos: ¿puede calcularse matemáticamente la cultura? *Think Big*, 2020

---

the conception of new works. It is a very complex issue, that we can only vaguely resolve in a project as short as this one, but we will try to touch on a few key points.

One way of looking at this debate is to argue that, just like a camera, these systems are mere tools (obviously increasingly complex given the evolution of technology) subject to the author's intention. Thus, without a human behind them, projects like DALL-E would not generate any art at all.

One could argue that another machine could be created in order to dictate ideas to the other system, but the key concept is that it would have no artistic intention or purpose. We would like to point out, moreover, that it is normal to view this subject with a certain reticence, because, just as we made a comparison between an art generation system and a camera, photography also took a long time to be accepted as art (even being overtaken by cinema, chronologically much later).<sup>5</sup>

### 3.1 Measure creativity

With this distinction in mind, we need to address another issue: how do we measure creativity in order to define whether a system is creative?

To enrich this work, we thought it appropriate to see for ourselves how far these AI systems can go in the creation of art. To do so, we have had the help of one of the most popular artificial art creation projects of recent times, DALL-E. In the following image, you can see one of the results that this system has generated based on the petition "an ukiyoe painting of a golden blonde angel with curly hair and wings and a feather in one hand and a rose in the other".



Figure 1: Output of [DALL-E](#).

Looking at the image, we can see its similarity to the input provided. Despite this, clear mistakes in the creation are also visible, such as the fact that the feather is nowhere. One could also discuss possible flaws such as the fact that he is not physically holding the rose as instructed, or that the angel's face is a bit "strange", but these would not be glaring infringements. Even if we are very strict, the work of the system is undeniably impressive.

### 3.2 Human factor

<sup>5</sup> E. Ros. Cuando la fotografía se convirtió en arte. *La Vanguardia*, 2020

---

However, it is impossible to deny the amount of work required to implement such a system. Within the architecture of a NN system, there are numerous variables of the utmost importance, as a variation in these leads to enormous alterations in the result. Thus, the human factor remains key (although not as visible) in the creation of these works of art.

We would like to highlight as an example a project carried out by one of the members of this team together with other colleagues from the University of A Coruña<sup>6</sup>. This work deals with the creation of an intelligent system capable of classifying works of art according to their artistic style. In its development, the effectiveness of the classification was measured using different types of models, techniques and architectures, demonstrating that the results were tremendously different depending on these.

### 3.3 CJUE definition of originality

The *Infopaq* case is a milestone in the legal definition of originality. This case is one of the most famous in term of originality and is often referred to when definition of originality is needed. In the discussion concerning the case, the CJUE defined originality as “an expression of the intellectual creation of the author of that work”<sup>7</sup>. Originality is now assimilated as the expression of an intellectual creation. This case was one of the first to present a broad and common definition of originality regardless the type of work of art. Such a broad definition has been polished, in subsequent cases the CJUE has refined the meaning of “intellectual creation”.

The terms “intellectual creation” have been used and clarify in the *Dataco* case<sup>8</sup>, in a discussion about a programming of football matches the court ruled : “the significant labour and skill required for setting up that database cannot as such justify such a protection if they do not express any originality in the selection or arrangement of the data which that database contains.”<sup>9</sup>

At first glance, it seems to exclude labour and skills of the definition of originality. Another case of the CJUE clarifies why the CJUE seems to exclude labour and skill of the definition of originality. Indeed, in the *Painer* case (c-145/10)<sup>10</sup>, the CJUE exclude any reference to merit or purpose in the definition of originality. The terms labour and skills in the *Dataco* case seems to translate the idea of merit expressed in the *Painer* case, which is also excluded from the definition.

<sup>6</sup> Jorge García Pombo Samuel Ramos Varela Alejandro Esteban Martínez Iván Pérez Longa, David Esteban Martínez. Sistema para clasificar obras de arte segun su estilo. [https://github.com/ivanprzlng/AA\\_ArtDetection/blob/fc63ea574ad52f395850048668d9c1eaccdea0a6/SistemaClasificarArte.pdf](https://github.com/ivanprzlng/AA_ArtDetection/blob/fc63ea574ad52f395850048668d9c1eaccdea0a6/SistemaClasificarArte.pdf), 2022

<sup>7</sup> Judgement of the court 17 January 2012, *Infopaq*, c-302/10, eu:c:2012:16, para 22.

<sup>8</sup> Benabou, valerie-laure. “originalité ? vous avez dit originalités ?”, Legicom, vol. 53, no. 2, 2014, pp. 5-15

<sup>9</sup> Judgment of the court, 1 March 2012, *dataco*, c-604/10, c:2012:115

<sup>10</sup> Judgment of the court, 1 December 2011, *painer*, c-145/10, eu:c:2011:798

---

*The Painer* case, in addition to clarifying the situation about skill and labour, clarifies the definition expressed in the *Infopaq* case discussed before. “Is to be considered original if it is the author’s own intellectual creation reflecting his personality”<sup>11</sup>.

The Court later explained her meaning of “reflect of personality” in the case *Funken Medien* as “making free and creative choices”<sup>12</sup>. The words “free choices” translate the idea of the absence of obstruction or barrier at the author’s expression and creativity, “the emphasis here is on the existence (a priori) of sufficient creative space, rather than on the creativity of the production as such.”<sup>13</sup>

In conclusion, about originality, on a European level, the CJUE has built a strong and constant definition through various case law. The definition currently used and referred to being the one developed in the *Painer* case (c145/10), with an emphasis of the reflection of personality and the existence of sufficient creative space. The strength of the definition is its broad purpose, it can be applied to any type of work mentioned in the Bern Convention and therefore to any copyrightable work. It is notable that in the *Dataco* case, the Court ruled that originality can be expressed in the arrangement of data contained in a data base<sup>14</sup>. Those expressions seem to translate very well to any work of art produced by an AI.

### **3.4 Can an AI express originality?**

Can an AI express originality is the first question to solve when it comes to copyright as said before. But the question can be understood in two different ways. The first and certainly the most insecure one being “Can AI express originality by itself?”. At first glance we can apprehend the difficulty of this task and the philosophical questioning behind it. In addition to the complexity of the task, the current legal framework excludes any legal capacity to the AI, and therefore an AI could not be considered as the legal author of any artistic work. That is why we won’t discuss the possibility of creation by an autonomous AI. The other way of conceiving this question is “Can an user express his originality through an AI?”. This matter seems more approachable without becoming too philosophical and more in accordance with our current legal framework and legal reasoning.

### **3.5 Can an agent/user express originality through an AI ?**

This part of the work has been greatly inspired by the work of Hugenholtz and Quintais<sup>15</sup>. Hugenholtz and Quintais described three different steps in the creative process they proposed to label as conception, execution and redaction. We will analyse these steps

<sup>11</sup> Judgment of the court, 1 December 2011, *Painer*, c-145/10, eu:c:2011:798, para 15

<sup>12</sup> Judgment of the court, 29 July 2019, *funken medien*, c-469/17, eu:c:2019:623

<sup>13</sup> Hugenholtz, p.b., quintais, j.p. copyright and artificial creation: Does eu copyright law protect ai-assisted out- put?.iic 52, 1190–1216 (2021). <https://doi.org/10.1007/s40319-021-01115-0>

<sup>14</sup> Judgment of the court, 1 March 2012, *dataco*, c-604/10, c:2012:115

<sup>15</sup> Hugenholtz, p.b., quintais, j.p. copyright and artificial creation: Does eu copyright law protect ai-assisted output?.iic 52, 1190–1216 (2021)

---

through the scope of AI and machine assisted creation in order to determine the importance of human originality in each one.

“The conception phase involves creating and elaborating the design or plan of a work.” As they specified, it is way more than just formulating the idea for a work. “It requires a series of fairly detailed design choices on the part of the creator: choice of genre, style, technique, materials, medium, format, etc.”

In a AI assisted creation of work, this part should include the choice of the AI because it will be greatly determined by the design choices. In fact, the user will first generate a general idea of his future creation (medium, style, genre as said before), this general idea will further determine the choice of AI used to transform this idea in a proper work.

The choice of AI and other factors could be considered as a start of free and creative choice and therefor originality but seems to be clearly insufficient. However, the expansion and the multiplication of variety of AI could lead this part of the process to take a more important role in the expression of user’s originality.

” The execution phase involves, in simple terms, converting the design or plan into what could be considered (rough) draft versions of the final work.” In order to have a better understanding of the expression of originality through AI assisted work we could use a comparison with photography which is now known to be an excellent way to express author’s originality.

In AI assisted creation, the author will use the AI as a tool to put in shape his general idea we talked about in the conception phase, just as the photographer will use his camera to formalize his general idea.

The only difference between the two is the complexity of the used tool, where AI for an un- accustomed user seems to produce results he couldn’t expect or predict. We consider that the lack of practice or skills of one user should not determine the possibility or not to express human originality through the tool. The comparison with photography seems relevant once again, as an unexperienced user of a modern camera (which includes a lot of settings, often automatic) will have issues expressing his originality considering the discussion of the *Painer* case <sup>16</sup>.

With a view of expansion of non-autonomous AI, we can expect an increase of liberty of choice for the users in the execution phase and therefor an increase of the human factor in the creative process. Even nowadays, some modern AI still offer a large space for creative choices through the different inputs offered to the user, which seems to fit the originality definition of the CJUE given in the *Funken Medien* case <sup>17</sup>.

<sup>16</sup> Judgment of the court, 1 December 2011, *Painer*, c-145/10, eu:c:2011:798

<sup>17</sup> Judgment of the court, 29 July 2019, *funken medien*, c-469/17, eu:c:2019:623



---

Finally, the redaction phase involves processing and reworking the draft versions produced in the execution phase into a finalised cultural product ready to be delivered to a publisher or other intermediary, or directly to the market. Any process or rework in order to finalise the work produced by the AI could itself be sufficient to consider it original considering precedents of national courts<sup>18</sup>.

In conclusion, we can see AI as a way to express the originality of its user, such as other tools like cameras where the tools only serve as an "interface". As an AI can offer a sufficient creative space (see Funken Medien), there is no need to deny the possibility for a user to express his originality through it. The most recent decisions of national courts seem to reinforce this conclusion. "a work of the mind created by a computer system can benefit from the rules protecting copyright, provided that it reveals even in a minimal way the originality that its creator wanted to bring"<sup>19</sup> In addition, as we saw, creativity and originality can be found in the phase preceding the intervention of the AI. We can now conclude that users can indeed express their originality through an AI. Considering the past reasoning, there is no legal justification, in regard to EU and national courts reasoning and precedents, to deny copyright to the author of work created with the assistance of an AI.

## 4 Technical view

### 4.1 Preliminary considerations

Before going into technical details, it is interesting to clarify several previous concepts in order to have a general idea of the subject.

#### 4.1.1 Generative and Discriminative Algorithms

*Discriminative* Algorithms try to, starting from the characteristics of some input data, predict the category to which these data belong. Thus, *Generative* Algorithms do precisely the opposite; instead of predicting a class from features, they try to create features having a predetermined category. Let's take an example. A *Discriminative* Algorithm would be able to tell whether a message is spam or not from an email. In turn, a *Generative* one could create a spam message.

#### 4.1.2 Unsupervised Learning

*Unsupervised Learning* is a Machine Learning method where a model is fitted to observations. It differs from *Supervised Learning* in that there is no a priori knowledge, i.e., the training data are not labeled and there are no previously defined classes.

As we only know the input data, but there are no output data corresponding to the inputs, we can only describe the structure of the data and thus try to find some kind of organization that

<sup>18</sup> Court of appeal riom, 14 may 2003, d. 2003, somm. 2754, obs.sirinelli, quoted by a. lucas and p. kamina, in: International copyright law practice, france, § 2[2][b]

<sup>19</sup> Bordeaux court of appeal (france), 31 january 2005, no. 03/05512

---

simplifies the analysis, so it is exploratory in nature. In this way, *Unsupervised Learning* is usually dedicated to clustering tasks, whose goal is to find similar groups in the dataset.

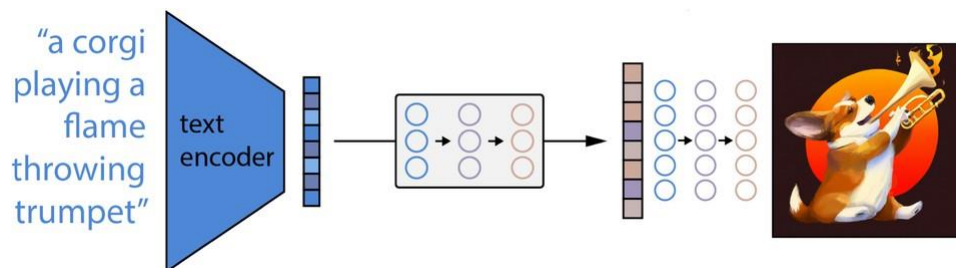
## 4.2 Generative Adversarial Network

### 4.2.1 Definition<sup>20</sup>

A Generative Adversarial Network (GAN) is an AI system based on Unsupervised Learning presented by Ian Goodfellow in 2014 based on 2 competing Neural Network (NN), the *generator* and the *discriminator*.

Given a set of target samples, the *generator* tries to produce samples that can fool the *discriminator* into believing they are real. This one tries to resolve real (target) samples from fake (generated) samples. Using this iterative training approach, we eventually end up with a *generator* that is really good at generating samples similar to the target ones.

Taking DALL·E (we will briefly discuss this tool in subsequent sections) for example, its operation can be simplified into three stages, explained with the following steps and diagram<sup>21 22</sup> below:



1. First, a text prompt is input into a text encoder that is trained to map the prompt to a representation space.
2. Next, a model called the prior maps the text encoding to a corresponding image encoding that captures the semantic information of the prompt contained in the text encoding.
3. Finally, an image decoder stochastically generates an image which is a visual manifestation of this semantic information.

<sup>20</sup> For more information on how this system works, please read: Alex Nichol Casey Chu Mark Chen Aditya Ramesh, Prafulla Dhariwal. Hierarchical text-conditional image generation with clip latents. 2022

<sup>21</sup> Victor Millan. Dall-e 2: ¿cómo funciona y qué supone? la ia que crea imágenes de la nada y es, simplemente, perfecta y aterradora. *Hypertextual*, 2022

<sup>22</sup> Ryan O'Connor. How dall-e 2 actually works. *AssemblyAI*, 2022

---

## 4.2.2 Types

Having clarified the concept of GAN, let's focus now on three different types, the Deep Convolutional GANs (DCGANs), the Wasserstein GANs (WGANs) and the Conditional GANs (CGANs).<sup>23</sup>

DCGAN are one of the less complex and easy to implement variations of GANs, in which the *discriminator* takes the generated images and real images as input and outputs a value between 0 and 1 i.e the confidence level of an image being real or fake, and the *generator* doesn't see real images, it learns via feedback from the *discriminator*.

In DCGANs, we always aim to maximize the score of classification. If the image is fake, the *discriminator* gives it a score value 0 and if the image is real the *discriminator* gives a score value 1. In WGAN, the task of the *discriminator* changes to more of a regression problem, renamed it as critics. The critic should measure the EM distance i.e how much work should be spent and find the maximum case.

CGANs is a much more placid variation of GANs. As the name implies, they are allowed to generate images that have certain conditions or characteristics. CGANs stands apart from the earlier variants discussed is both *generator* and *discriminator* receive additional conditioning input information, which could be a class of a current image or some other peculiarity. This offers more possibility compared to DCGANs who we don't have control over what class it generates. That particular issue of DCGANs is addressed in CGANs, we add an additional input layer with values of one-hot-encoded image labels.

## 5 Ethical approach

In this part, we will focus on the ethical approach of this work. To better understand the place of the AI in our society we will compare the AI with something that is already well implanted, the photography. First of all, we will compare photography and AI from a historical point of view with the fears brought by the arrival of new technologies in the field of arts. Based on this comparison we will look at whether it is possible to apply to AI, if used as a tool, the same kind of copyright protection that photography receives. And finally we will look at the importance of having a legal personality for copyright based on the Naruto monkey picture.

### 5.1 Photography and AI

First of all, a word about photography. Photography is the result of a series of technological and technical innovations in the fields of optics, chemistry, mechanics, electricity, electronics and computers. The conventional date for the invention of photography is 7 January 1839.<sup>24</sup>  
<sup>25</sup>

<sup>23</sup> Busayor. The story of dcgans, wgan and cgans. *Analytics Vidhya*, 2021

<sup>24</sup> Jean Alloy. The invention of photography - news - photography school paris. 2021

<sup>25</sup> Liz Masoner. Explore the major advances in the history of photography. 2019

---

For the purposes of this work, the intention is not to explain how photography was born or how it works. What is important to remember with photography is that when it arrived it raised many questions and fears.

Indeed, when photography arrived, for some people it was not considered as art, because it was “simply” a matter of pressing a button to get an image and there was nothing artistic about it. For others, photography was frightening because there was a fear that photography would replace the art of painting.

Nowadays, we can see that these fears were simply the fear of the new. Because today, firstly, photography is recognised as art and secondly, it has not supplanted or replaced painting.

The camera is therefore used as a tool that the photographer uses to create his work. Photography can be mastered, and some photos can be masterpieces. Nowadays, some photos are as famous as some famous paintings. And when a photo is highlighted, it is not the camera that is rewarded but the photographer who has chosen the right light, the right angle, the perfect moment to make it a work of art. Photography is now considered an art form.

Since photography has existed, painting has not been replaced. These two art forms co-exist and are two very different things. One hasn’t overtaken the other, it’s just the normal course of technological progress that has wanted photography to be created. You take something that already exists and make it into something new. Painting exists and photography exists. Just as cinema did not suppress theatre, we do not stop progress and therefore we do not suppress anything but create.

Today history is repeating itself, with a brand-new form of technology, Artificial Intelligence. As we have seen, AIs such as Dall-e are capable of creating works that could be described as artistic. We are therefore at the dawn of a possible new form of art, and the same fears resurface. Indeed, with the advent of Artificial Intelligence there is a renewed debate about whether it is art or not and the fact that AI is capable of creating thousands of works in a matter of minutes and therefore any other form of visual art will become obsolete.

Artificial Intelligence, like photography at the time, is strongly questioned as to whether it can be considered as art. Indeed, with AI it is “simply” a matter of entering instructions into the software and the AI will do the rest automatically, so it is difficult to attribute the rank of artist to the person who entered the instructions and to attribute to the work produced by the AI the status of a work of art. Here a parallel with photography is obvious, photography at its arrival had difficulty in finding a place for itself within what is recognised as art and yet the photographer uses his tool, the camera, to take photos and today the photographer is recognised as an artist and the photo as art. In the near future, it may be possible to attribute to AI the rank of art and to the person who entered the instructions the rank of artist.

When we see the power of an AI to create works of art, we have the right to ask ourselves whether AI will not destroy or replace other current visual art forms such as painting and photography. Indeed, the creative capacity of an AI is impressive, whereas before it took a

---

painter several weeks, months or even years to create a painting, an Artificial Intelligence is capable of creating several paintings in a few seconds. Already with the advent of photography everything was made faster, here AI is still a step higher. But as we have seen, photography has in no way supplanted or replaced painting and has even become an art form in its own right. The same thing could happen with AI. It will not replace anything but become something completely new and both photography and painting will exist with it.

As we have seen, throughout history the arrival of a new form of technology in the field of art can be frightening, but with time and acceptance this new form can become a new way to make art and above all will not replace the other art forms. The AI can therefore follow this path and become an art form on its own.

## **5.2 AI as a tool**

As we saw, in order to be protected by copyright, a work of art must be original. In the case of photography, for example, not all photos are protectable or copyrightable; only those that are original will be. We have seen above the questions that can arise about what is original and what is not. But what is important to remember here is that, like a photographer's camera, AI can be used as a tool.

Here a parallel is evident between photography and AI. Based on the copyright protection applied to photography; a work created by a human using an AI as a tool and if and only if that work is recognised as original, should also, like a photography, be protected by copyright.<sup>26</sup>

## **5.3 Legal personality - The monkey Naruto**

In 2011, on the island of Sulawesi, Indonesia, a black crested macaque grabbed David Slater's camera and pressed the shutter. The British wildlife photographer managed to retrieve his camera and published the pictures taken by the monkey named Naruto. These exceptional photos have made the rounds of the world, being picked up by numerous newspapers, magazines, websites and television programmes.<sup>27 28</sup>



Figure 2: Naruto monkey selfie by David J. Slater 2011.

<sup>26</sup> Copyright law: Understanding your rights as a photographer: Professional photographers of america. 2022

<sup>27</sup> Jason Slotkin. Monkey selfie' lawsuit ends with settlement between peta, photographer. 2017

<sup>28</sup> Susannah. Cullinane. Monkey does not own selfie copyright, appeals court rules. 2018

---

This first animal selfie went viral and the Wikimedia Commons Foundation, a freely licensed image library, added the photos to its database, allowing the world to use them without credit or purchase.

The media has also seized on the photograph freely. For them, the monkey is not a legal person and cannot claim copyright, just like David Slater who did not take the photograph. Thus, the photo is free of copyright and no one is supposed to get any money from it.

However, there has been some debate on the subject. David Slater, the photographer, felt that the photograph was rightfully his as he was the owner of the camera and the initiator of the settings that allowed the monkey to take a good picture.

There were therefore two possibilities: first, the monkey took the photo, but in the eyes of the law an animal has no legal personality and therefore cannot own the rights, so the photo does not belong to anyone. The second possibility is that the photo was taken by David Slater's camera, so it belongs to the photographer. This issue was also discussed at length in the legal world and even widened the debate on whether only human works can be copyrighted. So, there was a third possibility: the law is changed and the monkey owns the photograph.

As monkeys cannot take legal action, it is the organisation People for the Ethical Treatment of Animals (PETA) that launches the legal action. On 28 January 2016, the court gave its verdict: in the eyes of the current law, animals are not considered to be authors and therefore cannot be protected by American copyright law.

However, in September 2017, PETA and the photographer issue a joint statement announcing a settlement. David receives the copyright and agrees to donate 25% of the revenue from the use or sale of Naruto's photograph to charities protecting the habitat of Indonesian macaques. For the time being, the agreement between PETA and David remains in place as there are no real solutions from a legal point of view.

The main thing to remember about this debate is that important legal questions have been raised about the legal rights of animals and therefore also about non-humans such as artificial intelligences.

To make the link between the Naruto monkey and AI, as we know, an AI is not a human and therefore cannot possess the title of legal personality as an animal seen in the example above. Therefore, nowadays, if a work created by an AI wants to claim copyright protection, the AI must be used as a tool because an AI does not have legal personality, and it is therefore the human behind the work created with the AI as a tool that would receive copyright. Indeed, there must be a human behind the creation of a work, because as we have seen with the photo and the monkey Naruto, the law does not allow to grant a copyright to a non-human.

This is why, in the possibility that an AI could be independent, it would be difficult, if not impossible, to grant it copyright protection because it cannot have a legal personality since an AI, even if independent, is not a human being. Of course, nowadays, the idea of an

---

independent AI, capable of thinking for itself and being creative, even original, is an illusion, and granting it copyright protection would lead to a lot of debate, as with the monkey Naruto, as to whether only humans can have a legal personality.<sup>29</sup>

## **6 Last points**

### **6.1 Conclusion**

As we have seen in this work, the arrival of AI in the art world raises many debates. To answer our research question “Should artificially-generated works of art be copyrightable?” we based our work on technical, legal and ethical points.

Based on the Bern Convention and its interpretation by the CJEU, we concluded that the author of a work of art, produced by an artificial intelligence expressing the originality of this author, should benefit from copyright protection.

Furthermore, after drawing a parallel with photography, we saw that an AI can become an art form in its own right. We therefore concluded that an AI used as a tool could leave a creative space for the author to express his originality, in order to create a copyrighted work of art. Consequently, the user of the AI should be considered as the author benefiting authorship and copyright protection.

Finally, in this work, we focused on AI as a tool and the importance of having a legal personality. This is why the idea of an independent artificial intelligence, and the granting of copyright protection to a non-human, may raise new debates.

To answer our research question we have therefore concluded, based on all the points raised in this work, that yes, an artificially-generated works of art should be copyrightable.

<sup>29</sup> Jessica Ellis. What is a legal personality? 2022

---

## 7 Glossary

**Algorithm:** In mathematics, logic, computer science and related disciplines, an algorithm is a set of defined, non-ambiguous, ordered and finite instructions or rules that typically allows solving a problem, performing a computation, processing data and carrying out other tasks or activities. Given an initial state and an input, following successive steps leads to a final state and a solution is obtained.

**DALL·E:** DALL·E and DALL·E 2 are machine learning models developed by OpenAI to generate digital images from natural language descriptions. <https://openai.com/dall-e-2/>.

**EM distance:** EM distance also known as wasserstein distance was introduced as metric, EM-distance is the amount of effort to move one distribution to another, i.e how much work you should spend to transport the distribution to another one. The value is positive and the shape is symmetric.

**Machine Learning:** Subfield of computer science and a branch of Artificial Intelligence, whose goal is to develop techniques that enable computers to learn. Machine learning Algorithms build a model based on sample data, known as training data, in order to make predictions or decisions without being explicitly programmed to do so.

**Neural Network:** According to IBM, Neural Networks, also known as artificial neural networks (ANNs) or simulated neural networks (SNNs), are a subset of machine learning. Their name and structure are inspired by the human brain, mimicking the way that biological neurons signal to one another. They are comprised of a node layers, containing an input layer, one or more hidden layers, and an output layer. Each node, or artificial neuron, connects to another and has an associated weight and threshold.

## Acronyms

**AI:** Artificial Intelligence.

**CGAN:** Conditional GAN.

**DCGAN:** Deep Convolutional GAN.

**GAN:** Generative Adversarial Network.

**NN:** Neural Network.

**PETA:** People for the Ethical Treatment of Animals.

**WGAN:** Wasserstein GAN.



---

## 8 Bibliography

Alex Nichol Casey Chu Mark Chen Aditya Ramesh, Prafulla Dhariwal. Hierarchical text conditional image generation with clip latents. 2022.

Benabou, valerielaure. " originalité ? vous avez dit originalités ? ", legicom, vol. 53, no. 2, 2014, pp. 5-15.

Bordeaux court of appeal (france), 31 january 2005, no. 03/05512.

Busayor. The story of dcgans, wgan and cgans. Analytics Vidhya, 2021.

Copyright law: Understanding your rights as a photographer: Professional photographers of america. 2022.

Court of appeal riom, 14 may 2003, d. 2003, somm. 2754, obs.sirinelli, quoted by a. lucas and p. kamina, in: International copyright law practice, france, § 2[2][b].

E. Ros. Cuando la fotograf´ia se convirti´o en arte. La Vanguardia, 2020.

High-level expert group on artificial intelligence, "a definition of ai: Main capabilities and scientific disciplines" december 2018. 2018.

Hugenholtz, p.b., quintais, j.p. copyright and artificial creation: Does eu copyright law protect ai-assisted out- put?. iic 52, 1190–1216 (2021). <https://doi.org/10.1007/s40319-021-011150>.

Hugenholtz, p.b., quintais, j.p. copyright and artificial creation: Does eu copyright law protect ai-assisted output?. iic 52, 1190–1216 (2021).

Jason Slotkin. Monkey selfie' lawsuit ends with settlement between peta, photographer. 2017.

Jean Alloy. The invention of photography - news - photography school paris. 2021.

Jessica Ellis. What is a legal personality? 2022.

Jorge Garc´ia Pombo Samuel Ramos Varela Alejandro Esteban Mart´inez Iva´n Pe´rez Longa, David Esteban Mart´inez. Sistema para clasificar obras de arte segun su estilo. [https://github.com/ivanprzlng/AA\\_ArtDetection/blob/fc63ea574ad52f395850048668d9c1eaccdea0a6/SistemaClasificarArte.pdf](https://github.com/ivanprzlng/AA_ArtDetection/blob/fc63ea574ad52f395850048668d9c1eaccdea0a6/SistemaClasificarArte.pdf) , 2022.

Judgement of the court 17 january 2012, infopaq, c-302/10, eu:c:2012:16.

Judgment of the court, 1 december 2011, painer, c-145/10, eu:c:2011:798.

Judgment of the court, 1 december 2011, painer, c-145/10, eu:c:2011:798.

Judgment of the court, 1 march 2012, dataco, c-604/10, c:2012:115.

---

Judgment of the court, 1 march 2012, dataco, c-604/10, c:2012:115.

Judgment of the court, 29 July 2019, funken medien, c-469/17, eu:c:2019:623.

Judgment of the court, 29 July 2019, funken medien, c-469/17, eu:c:2019:623.

L. Kmonljen. Inteligencia artificial, humanismo y algoritmos: ¿puede calcularse matemáticamente la cultura? Think Big, 2020.

Liz Masoner. Explore the major advances in the history of photography. 2019.

Ryan O'Connor. How dall-e 2 actually works. AssemblyAI, 2022.

Summary of the berne convention for the protection of literary and artistic works (1886)", world intellectual property organization, <https://www.wipo.int/treaties/en/ip/berne/summaryberne.html>(consulted on 13.11.22).

Susannah. Cullinane. Monkey does not own selfie copyright, appeals court rules. 2018

Victor Millan. Dall-e 2: ¿cómo funciona y qué supone? la ia que crea imágenes de la nada y es, simplemente, perfecta y aterradora. Hypertextual, 2022.