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# Artificial Intelligence and Copyright Law in a European context

A study on the protection of works produced by AI-systems

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# Summary

"Rapid technological developments continue to transform the way works and other subject matter are created, produced, distributed and exploited. New business models and new actors continue to emerge. Relevant legislation needs to be future proof so as not to restrict technological development. The objectives and the principles laid down by the Union copyright framework remain sound. However, legal uncertainty remains, for both rightsholders and users, as regards certain uses, […] and other subject matter in the digital environment"[1].


As seen above, the technologies in various fields such as AI-productions are evolving at a fast pace. These computer programs are, more than ever, able to create and learn with very little human interaction. This entails that new challenges regarding copyright law are lying ahead, as these new types of works might not all fulfil the traditional EU copyright requirements, calling for originality and human authorship. If no protection is given to these works companies, programmers and artists may not find the incentive to develop new computers and/or systems and may be hesitant to invest money in the creation of new types of technologies.

This master thesis starts by discussing current copyright rules and if there is presently a copyright protection for these types of works. There is a possibility to protect works that have been generated by AI's. However, this is only possible if a human is using the AI as a "tool", in order to reach a certain end-goal. There has to be a clear link between the human author and the machine, otherwise neither authorship nor originality can be established. Ultimately, in a scenario where such a link is missing, the work would fall into public domain.

The beforementioned part will be followed by possible solutions for protecting these works in the future. In fact, it is interesting to look into the legislation of countries such as the UK, the US and EU Member States in order to study their ways of protecting similar types of works. These solutions will treat topics such as AI as an "employee", the UK concept of computer generated works and the attribution of legal personhood to AI-systems. Additionally, there might be a need for changing the structure of the current EU copyright rules, namely by lowering the thresholds for protection, in order to widen the possibilities to give copyright protection to AI-generated works.

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[1] Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC (Text with EEA relevance) para 3 (English text).

Ultimately, and in my opinion, the best way of protecting AI-generated works would be, as presented in the seventh chapter of this master thesis, to develop a new sui generis rule for AI-generated works. This solution is the most likely to see the day, as it is a flexible and easy way of attributing copyright protection without changing and lowering the traditional copyright thresholds for protection.

# Sammanfattning

"Den snabba tekniska utvecklingen fortsätter att förändra det sätt på vilket verk och andra skyddade alster skapas, produceras, distribueras och används. Nya affärsmodeller och nya aktörer fortsätter att växa fram. Relevant lagstiftning måste vara framtidssäkrad för att inte begränsa denna tekniska utveckling. De mål och principer som fastställs i unionens ram för upphovsrätten är fortsatt välgrundade. Det råder dock fortfarande ovisshet om rättsläget både hos rättsinnehavare och användare när det gäller vissa användningsområden, […] av verk eller andra alster i den digitala miljön"[2].

Citatet ovan visar på att AI utvecklas snabbt och att det är alltmer kapabelt att framställa alster samt att lära sig trots begränsad mänsklig interaktion. Detta betyder att det framöver kommer att finnas nya utmaningar inom det upphovsrättsliga området. Samtliga nya slag av AI-producerade verk (eller andra skyddade alster) kommer med säkerhet inte att nå verkshöjd eftersom de klassiska upphovsrättsliga kraven kan vara svåra att uppfylla, det vill säga kraven på originalitet och mänsklig upphovsman för verket i fråga. Om inget upphovsrättsligt skydd är fastställt, kommer företag, programmerare och artister med hög sannolikhet inte att finna incitament för att utveckla nya AI-baserade datorer och/eller system. Av denna anledning kommer de att vara tveksamma till att investera inom nya tekniska områden.

Denna masteruppsats kommer att studera den nuvarande upphovsrätten inom EU och kommer därefter att fastställa om det för närvarande finns skydd för AI-producerade verk. Det finns möjlighet att skydda verk som har blivit skapade av AI-system om det finns en länk mellan den mänskliga upphovsmannen och det slutliga verket. I detta fall betraktas AI-systemet som ett redskap för att skapa ett specifikt alster. Om länken mellan den mänskliga upphovsmannen och verket är för abstrakt, finns en stor risk för att kriterier som originalitet och upphovsman inte uppnås. Resultatet av en sådan avsaknad är att verket blir allmän egendom.

Tidigare nämnda teman kommer att kompletteras med möjliga framtida lösningar som skulle möjliggöra ett upphovsrättsligt skydd för AI-producerade verk. Lösningarna kommer att behandla teman som AI som "anställd", det engelska konceptet av datorproducerade verk och tillskrivning av juridisk personlighet till AI-system. Det kan i framtiden också bli nödvändigt att förändra den nuvarande

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[2] Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC (Text with EEA relevance) para 3 (Swedish text).

europeiska upphovsrättens struktur genom att sänka de tröskelvärden för verkskydd som tillämpas idag. Detta skulle möjliggöra ett bredare upphovsrättsligt skydd som följaktligen skulle skydda AI-producerade verk. Arbetet lyfter även hur långt länder som England, USA och EU-medlemsstater har kommit gällande skyddet av dessa typer av verk.

Slutligen är det min åsikt att utvecklingen av en sui generis regel, specifikt utarbetad för AI-producerade verk, hade varit det mest anpassade skyddet för denna typ av alster. Detta framkommer även i det sjunde kapitlet av denna masteruppsats. Denna framtida lösning är den som mest troligen går att förverkliga då den fungerar i enlighet med den nuvarande europeiska upphovsrätten och kräver inte att några traditionella tröskelvärden för verkskydd sänks.

# Preface

"We keep moving forward, opening new doors, and doing new things, because we're curious and curiosity keeps leading us down new paths.", Walt Disney.

This is the master's thesis "Artificial Intelligence and Copyright Law in a European context", which is based on a great personal interest of mine to find and understand the underpinnings of copyright law. During my current master's studies, I found it particularly interesting to study the applicability of various areas of EU law to new technologies. I therefore decided to write on the applicability of copyright law to works autonomously generated by AIs in the EU.

My master's program in European Business law is coming to an end. It has been a pleasure to share these rewarding and meaningful years with my classmates. Studying at the Faculty of Law has been an exceptional experience and has enabled me to build friendships with amazing people from all around the globe.

I would like to thank my thesis supervisor Aurelija Lukoseviciene for her guidance, patience and support during the writing of my thesis. Your help was more than appreciated.

I would also like to thank my parents Helena and Jean-François and my sister Victoria for being my greatest cheerleaders and for always helping me and motivating me in my work.

Thank you for these two wonderful years Lund University!

Erika Hubert,

Helsingborg, 28th May 2020.

# Abbreviations

| | |
|---|---|
| **AI** | Artificial Intelligence/ artificiell intelligens (in Swedish) |
| **CDPA** | UK Copyright, designs and Patents Act 1988 |
| **CGW** | Computer generated works (as seen in the UK Copyright, Designs and Patents Act 1988, Section 178) |
| **CJEU** | The Court of Justice of the European Union |
| **CPI** | Code de la Propriété Intellectuelle (*the French Intellectual Property law*) |
| **EU** | The European Union |
| **IP** | Intellectual Property |
| **MS** | Member State of the European Union |
| **TEU** | Treaty on European Union |
| **UK** | The United Kingdom |
| **URL** | Lag (1960:729) om upphovsrätt till litterära och konstnärliga verk (*the Swedish copyright law*) |
| **US** | The United States of America |
| **WIPO** | World Intellectual Property Organization |
| **WMFH** | Works made for hire (as seen in US Copyright Act, Section 101) |

# 1 Introduction

## 1.1 Background

The area of Intellectual property law and more specifically copyright law aims to give protection and/or exclusive, economic and moral rights to works of authorship in order to promote areas such as, but not limited to, cultural, technological and scientific progress.

IP law, as many other legal areas, has during centuries evolved to fit the society within which it is applicable. Nowadays, in order to fit our ever more globalized society, areas of IP law have been harmonized and changed. Copyright law has faced a new realm of creativity and ingenuity through new technologies.

Artificial intelligence is one of the most discussed topics when it comes to the evolution of intellectual property law towards today's digitalized and technologically based society. In fact, AI "is expected to gain a central role in our daily lives in the not-too-distant future"[3]. Headlines have recently referred to machine-produced paintings, music composed by algorithms or even drugs discovered by computer programs[4]. Several of the said works have been autonomously created without human contribution during the creative process. Some AI-systems even have the capacity of running a company without any human input at all[5].

This creates a wide range of questions related to the nature of the AI-created works, the protection of them by copyright law and the authorship in the European Union ("EU"). In fact, according to Daniel Gervais, "[t]he point that Artificial Intelligence (AI) will change the law is trite and obvious by now. How it will change the law, and how the law will change AI, are much harder questions to answer, however"[6].

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[3] Maria Iglesias, Sharon Shamuilia and Amanda Anderberg, 'Intellectual Property and Artificial Intelligence – A literature review' EUR 30017 EN (ISBN 978-92-76-14178-5, doi:10.2760/2517, Publication Office of the European Union, 2019) 4.
[4] Ibid 3.
[5] Matthew Griffin, 'No Humans Required, The Fully Autonomous AI Running A Wall Street Hedge Fund - 311 Institute' (*311 Institute*, 2017) <https://www.311institute.com/no-humans-required-artificial-intelligence-is-running-wall-street-hedge-funds/> accessed 15 May 2020.
[6] Daniel Gervais, 'Is Intellectual Property Law Ready for Artificial Intelligence?', GRUR International, Volume 69, Issue 2, February 2020, Pages 117–118 < https://doi.org/10.1093/grurint/ikz025> accessed 14 May 2020.

In fact, legal issues may arise when AI-machines become sufficiently autonomous to make their own choices, as the legal situation deriving from that will undeniably change the way we perceive the work that has been generated[7].

This master's thesis will look into the copyright law and its general principles in order to see what problems lay ahead if one would want to give copyright protection to an AI-created work. This thesis will focus on the legislation, its applicability "as is" to AI-created works and possible solutions when it comes to the authorship and accordingly the protection of this very specific type of works.

## 1.2 Purpose and problem questions

The purpose of this master's thesis is to look into copyright law in order to find if it is applicable "as is" to works created by AI. Additionally, this thesis will give the opportunity to research possible solutions to the issue of AI-created works that do not reach the conditions for copyright protection.

The following questions will be brought up in this thesis:

- Are works produced by an autonomous AI-system, protected under EU copyright law?

- If not, what solutions would there be to grant protection to these works in the future? And also, in parallel, in whom should/could these rights vest?

## 1.3 Delimitations/Scope

Copyright law and its principles can widely vary depending on the country. This is why I have chosen to focus on EU copyright law in order to give a more unified approach to the subject. Nonetheless, examples from Member States ("MS") and countries outside of the EU will also be used. Furthermore, I will work with relevant information provided by the World Intellectual Property Organization

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[7] Ibid.

in order to provide a more complete thought-process and understanding of this very complicated and wide topic.

AI-generated works do impact the whole thought-process one may have of intellectual property law, but this master's thesis will, for the sake of time and space management, only discuss its relation to copyright law. AI-system are bringing various legal questions forth. This thesis will particularly focus on works produced by autonomous AI-systems and evaluate their protectability under current EU IP-law. This, rather than studying the AI-system itself, calls for research on EU copyright law in particular.

This work will solely focus on AI-generated works, where the AI has reached such a level of automatization that human contribution is either inexistent or trivial to the creative process. These autonomous AI-systems are hereby defined as being intelligent machines that are, at least to some degree, independently, autonomously and/or through self-learning processes, carrying out different sets of operations on behalf of the creator, owner or user of the program[8]. This definition refers to fully autonomous AIs that may be created in the future[9] and partially autonomous AIs that already exist today.

This work will neither discuss related rights nor the questions related to liabilities concerning AI generated works, as it would be widening the topic even further.


# 1.4 Methodology and Information


This thesis is going to look into a legal issue that has not been solved within EU law. This entails that there is no fully applicable legislation on that particular topic yet.

The study will primarily be based on a legal dogmatic method. The method will predominantly have a formal approach[10], as I will begin by looking into current EU copyright law. The legal dogmatic approach will also be used at a second stage during which I will attempt to find solutions to the lack of protection of certain

[8] 'Autonomous Agent' (*En.wikipedia.org*) <https://en.wikipedia.org/wiki/Autonomous_agent#cite_note-1> accessed 8 May 2020.

[9] Cadie Thompson, 'Here's The Real Reason Artificial Intelligence Could Be A Threat' (*Business Insider*, 2015) <https://www.businessinsider.com/autonomous-artificial-intelligence-is-the-real-threat-2015-9> accessed 15 May 2020.

[10] Alexander V. Petrov and Alexey V. Zyryanov, 'Formal-Dogmatic Approach In Legal Science In Present Conditions' (*Journal of Siberian Federal University*, 2018) <http://elib.sfu-kras.ru/bitstream/handle/2311/71664/Petrov.pdf;jsessionid=086B7F52534C42A91F7EB9CFF372442F?sequence=1> accessed 17 May 2020.

types of autonomous AIs. I will do so by describing laws that are used in various countries (such as the US, the UK and Ireland).

The study will, in addition to the beforementioned, use a legal-political method[11], since I will not only describe but also analyse the current copyright-context. I will, in addition, test the applicability of EU copyright law to various types of works that have been autonomously generated by an AI. Furthermore, I will analyse the applicability of the solutions found in the previously mentioned countries, to the European context and find out what legislative changes would have to be done in the future if one would want to attribute copyright protection to works autonomously generated by AI-systems.

The work will primarily be based on legal findings. It will firstly be based -but not solely- on European harmonized copyright law, relevant case law and communications and/or reports issued by European Institutions. It will also use case law and country-specific laws and regulations. Legal articles, reports, books and publications from various sources will be utilized as well.

The thesis will also have a more philosophical approach, as I will try to find possible solutions to the lack of copyright protection when it comes to AI-generated works. This will bring out a more societal and ethical reflections.

# 1.5 Former Legal Research on the Subject

This is subject is still relatively new. Only a few countries, if any, have started to adapt their laws and regulations in order to fit todays digitalized world. Lawyers and other specialists have during the last few years started to write and discuss the topic. This means that, for the time being, many doctrinal articles and discussions[12] are being produced, but that there is still a lack of legal initiative in order to change or create new rules regarding copyright law and AI-generated works. Consequently, there is no definite solution nor indication which changes on if and/or how copyright law and/or any other relevant law, will have to change in order to suitably protect AI-created works and their authors.

Legal scholars have during the last few years been researching on topics such as - but not limited to- artificial intelligence and copyright[13], the dilemmas around the

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[11] Rebecca Söderström, 'PM-skrivande på terminskurs 5' (2014, Uppsala Universitet).
[12] As for example the Conference 'Artificial Intelligence (AI), Data Protection, and Intellectual Property Law in a European context', (LU IP Lund University, 13th of December 2019).
[13] Andres Guadamuz, 'Artificial Intelligence And Copyright' (*Wipo.int*, 2017) <https://www.wipo.int/wipo_magazine/en/2017/05/article_0003.html> accessed 23 March 2020.

topic[14], the challenges these new types of technologies entail[15] legal personhood for AIs[16] and the applicability of current EU copyright law to AI-generated works[17].

## 1.6 Disposition

The master's thesis will start by defining AI and its role as a creator (chapter 2), after that there will be a general introduction to copyright law and principles in the EU (chapter 3), which will be followed by an analysis of its applicability to AI-generated works (chapter 4). Thereafter, there will be a short presentation of persons (legal and natural), that could be awarded rights and protection over these works in the future (chapter 5). Presently, AI-generated works are not protected by copyright law, I will therefore, in my sixth chapter (chapter 6), present possible future solutions to the previously presented issue. My seventh chapter will present an even more plausible solution to the presented issues, namely a sui generis rule (chapter 7). Finally, all the previously mentioned information will be aggregated to a final and concluding analysis (chapter 8).

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[14] Kalin Hristov, 'Artificial Intelligence and the Copyright Dilemma' (2017) 57 IDEA 453.
[15] Begoña González Otero and Joao Pedro Quintais, 'Before The Singularity: Copyright And The Challenges Of Artificial Intelligence' (*Pure.uva.nl*, 2018) <https://pure.uva.nl/ws/files/34082305/Before_the_Singularity_Copyright_and_the_Challenges_of _Artificial_Intellige.pdf> accessed 3 April 2020.
[16] Tomasz Pietrzykowski and Visa A. J Kurki, *Legal Personhood: Animals, Artificial Intelligence And The Unborn* (Springer 2017).
[17] 'Is Intellectual Property Law Ready for Artificial Intelligence?' (n6).

# 2 Artificial Intelligence?

Artificial intelligence can be quite a difficult, uneasy notion to grasp. The second chapter of this thesis will therefore look into the definition of AI (2.1), followed by the concept of AI as a creator (2.2) and will finally be concluded with a part on the reasons why AI-generated works should be protected (2.3).

## 2.1 Definition

In order to understand the topic of this master's thesis, it is very important to grasp the notion of artificial intelligence in a copyright law-context.

AI can be defined in many ways. There is in fact, as of today, no common definition of AI. This concept is an umbrella term that covers multiple technical computer-based systems which are developed to "mimic human behaviour"[18].

Commonly, and as defined by the 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). [19]"

AI systems can present themselves in very different ways, as some systems are narrower and others more general (and/or strong)[20]. As of today, true general AI systems remain out of our reach as they are too complicated to create[21]. Some AI-

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[18] Josef Drexl and others, 'Technical Aspects Of Artificial Intelligence: An Understanding From An Intellectual Property Law Perspective' 1st edn Max Planck Institute for Innovation and Competition Research Paper No 19-13 2019 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3465577> accessed 16 March 2020.

[19] Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions on Artificial Intelligence for Europe, Brussels, 25.4.2018 COM (2018) 237 final.

[20] High-Level Expert Group on Artificial Intelligence (the AI HLEG), 'A Definition Of AI: Main Capabilities and Disciplines' (2019) 5.

[21] Michael Copeland, 'The Difference Between AI, Machine Learning, And Deep Learning? | NVIDIA Blog' (*The Official NVIDIA Blog*, 2016) <https://blogs.nvidia.com/blog/2016/07/29/whats-difference-artificial-intelligence-machine-learning-deep-learning-ai/> accessed 23 March 2020.

systems are made to perform specific delimitated tasks, other systems are instead intended to perform, as closely as possible, as a human would. In fact, the concept of machine learning could be defined as the use of algorithms to "parse data, learn from it, and then make a determination or prediction about something in the world"[22].

This means that the AI is trained to learn and to perform certain tasks. One of the newest and currently most utilized "types" of AI is without a doubt deep learning algorithms. This process is inspired by the functioning of the human brain and is based on "artificial neural networks"[23] which consists of different connections and layers of data. AI can, through deep learning, recognize scenarios which would be difficult for the human brain to detect. This process enables a more efficient use of machine learning.

It is important to make this differentiation of levels of autonomy of AI as there may otherwise be some confusion when one wants to define what AI is. It also explains why it is so complicated to find suitable legal rules on how AI generated works should be protected.

# 2.2 AI as a creator

In 1999, chief executive officer Richard Thoman declared that "value added is going to be created […] through the management of intellectual property […] and […] companies that are good at managing IP will win"[24]. It is therefore no surprise that companies are increasingly investing in AI to stay competitive on today's market. AI is in fact capable of creating works.

The forthgoing is primarily set into action when the AI is having access to a database filled with, for example, works created by humans in the past. The AI will then, through a "deep learning" process, analyse, adapt and modify the different works in order to create a new one.

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[22] Ibid, Machine Learning – An Approach to Achieve Artificial Intelligence.
[23] Ibid, Deep Learning – A Technique for Implementing Machine Learning.
[24] Kevin Rivette, Henry Nothhaft and David Kline, 'Discovering New Value In Intellectual Property' (*Harvard Business Review*, 2000) <https://hbr.org/2000/01/discovering-new-value-in-intellectual-property> accessed 18 May 2020. You may also find additional information on that topic in Erika Hubert, 'The European Commission's review of Mergers and Acquisitions involving Intellectual Property rights' (2020) 12-13.

Nowadays, AI is capable of producing a multitude of works such as music[25], poems[26], works of art[27]. According to Andres Guadamuz "the rise of machines is here, but they do not come as conquerors, they come as creators"[28]. In some aspect they are already capable of outpacing the human mind[29].

There are many examples of assets that have been generated by AI machines in the past five years. To name only one type of work of art generated by AIs, researchers have been increasingly interested in using these intelligent machines to generate paintings.

One of the most discussed AI-generated work is the "Next Rembrandt" painting. This "computer-generated 3-D-printed painting [was] developed by a facial-recognition-based AI algorithm that uses scanned data from"[30] works painted by Rembrandt.

Other, more recent, AI-generated paintings were created by the eDavid system[31], a "painting machine that mimics human painters and is able to distribute real paint on a real canvas"[32]. This machine is actually not only composed of an AI-system but is also combining sensors, cameras and a robotic arm to "physically" paint art works[33].

These works of art would undeniably have been copyright protected if a natural person would have created it, but an interesting question remains: are these types of AI-generated works equally protected by copyright law?

[25] 'Aiva Is The First AI To Officially Be Recognised As A Composer' (*The World's Number One Portal for Artificial Intelligence in Business*, 2017) <https://aibusiness.com/aiva-is-the-first-ai-to-officially-be-recognised-as-a-composer/> accessed 23 March 2020 ; Samuel Karlsson 'Artificiell intelligens och rättssubjektsbegreppet inom upphovsrätten'(2019) < http://lup.lub.lu.se/student-papers/record/8977382> accessed 23 March 2020.

[26] Matt Burgess, 'Google's AI Has Written Some Amazingly Mournful Poetry' (*Wired.co.uk*, 2016) <https://www.wired.co.uk/article/google-artificial-intelligence-poetry> accessed 23 March 2020.

[27] Mark Brown, 'New Rembrandt' To Be Unveiled In Amsterdam' (*the Guardian*, 2016) <https://www.theguardian.com/artanddesign/2016/apr/05/new-rembrandt-to-be-unveiled-in-amsterdam> accessed 23 March 2020.

[28] 'Artificial Intelligence And Copyright' (n13).

[29] Woodrow Barfield and Ugo Pagallo, *Research Handbook On The Law Of Artificial Intelligence* (Edward Elgar 2018) and more particularly the 19th chapter of Artificial Intelligence and the creative industry, written by Madeleine de Cock Buning, 517.

[30] 'Intellectual Property and Artificial Intelligence – A literature review' (n3) 12; see also 'The Next Rembrandt' (*The Next Rembrandt*) <https://www.nextrembrandt.com> accessed 9 May 2020.

[31] E-David Team, 'Project | E-David.' (*Graphics.uni-konstanz.de*) <http://graphics.uni-konstanz.de/eDavid/?page_id=2> accessed 9 May 2020.

[32] Ibid.

[33] You may find e-Davids most recent artworks at e-David Team, 'Artworks | E-David.' (*Graphics.uni-konstanz.de*) <http://graphics.uni-konstanz.de/eDavid/?page_id=18> accessed 9 May 2020.

It might be important to attribute some kind of protection to these works, as they are growing in number. Additionally, there are still some unclarities on whether works generated by AI-systems are protected by traditional copyright or not.

## 2.3 Why should AI-generated works be protected?

"Robotic artists"[34] have been creating various types of works for at least ten years now and these types of works have an undeniable effect on today's copyright law[35]. Unclarities are brought forward by MSs and IP organisations regarding whether (and when) these types of works are copyright protected. This entails that there are questions regarding the applicability of current EU copyright law to certain types of AI-generated works. Traditionally, the ownership of the work, even computer-generated, was not questioned as the AI was a tool rather than an actor creating works autonomously[36]. But today, as the AI-technologies are getting more efficient and autonomous, the issues regarding authorship and copyright protection over AI-generated works are more important than ever.

Important economic and commercial decisions may come to rest on whether these works can be protected or not. If not protected, they may fall into public domain which might slow down the development of AI-machines[37]. This is why it is absolutely necessary to protect these types of works. In fact, works produced by AIs may have a great commercial or scientific value (e.g. the creation of a new drug) and the absence of any copyright protection may be a deterrent to make AI systems altogether.

If all (or some) works generated by AI were not protected and covered by EU copyright law, there would be a negative impact. It could, for instance, affect the progress of arts and technologies, healthcare, science and the industry. Intelligent computer programs are already being used all over the world in different fields, as they are very efficient and accurate. These computers are consequently gradually transforming "the way we produce and distribute goods and services, as well as the way we work and live"[38].

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[34] 'Artificial Intelligence And Copyright' (n13).
[35] Ibid.
[36] Ibid.
[37] 'Artificial Intelligence And Intellectual Property: An Interview With Francis Gurry' (*Wipo.int*, 2018) <https://www.wipo.int/wipo_magazine/en/2018/05/article_0001.html> accessed 2 April 2020.
[38] Ibid.

There may not be any incentive to develop autonomous AI-systems if one knows that the works emanating from them are not protected by copyright law. These uncertainties are part of the major issues which teams working with AI-technologies are facing today.

The solution regarding the protection of these works would have to create a balance between the AI-developers incentive to create and the legal certainty. It would also have to guarantee a good functioning of the internal market. According to Kalin Hristov, "[s]atisfying these requirements would ensure the smooth development of AI and secure its long- term role as a driver of creativity and innovation"[39].

Due to the importance of the beforementioned, this master's thesis will look into whether AI-generated works are copyright protected or not. If not, it will also study different ways of protecting these works in the future.

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[39] 'Artificial Intelligence and the Copyright Dilemma' (n14).

# 3 Copyright law principles in the EU

The third chapter of the master's thesis will shortly describe the general copyright law principles in the EU through an introduction (3.1), followed by the conditions of protection (3.2), the rights conferred (3.3) and, finally, a conclusion (3.4).

## 3.1 Introduction to the harmonization of copyright law in the EU

Copyright law protects "original works in the field of literature and the arts"[40]. This includes creations of the mind such as musical composition, writing and visual art.

This area of intellectual property law has been defined by WIPO as "a legal term used to describe the rights that creators have over their literary and artistic works. Works covered by copyright range from books, music, paintings, sculpture, and films, to computer programs, databases, advertisements, maps, and technical drawings"[41][42].

This specific type of IP law is partially harmonized in the EU. National laws may still differ from each other in aspects such as moral rights, copyright contract law, limitations and exceptions[43]. In fact, the said harmonization of copyright law has been slow and cautious[44] as it is a very important topic for the member states. This legal subject is sensitive due to the eventual impacts it may have on the countries' economy, commercial relations and the member states' citizens right to dispose of their works.

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[40] Annette Kur, Thomas Dreier and Stefan Luginbühl, *European Intellectual Property Law* (2nd edn, Edward Elgar Publishing Limited 2019) 287.

[41] WIPO, 'Copyright' (*Wipo.int*, 2020) <https://www.wipo.int/copyright/en/> accessed 25 March 2020.

[42] The list is not exhaustive, as it presents only some examples of works that are covered by copyright.

[43] *European Intellectual Property Law* (n40) 293-294.

[44] Ibid 55.

Copyright is, from the beginning, firmly based on the principle of territoriality[45]. Copyright Directives have and are dealing with the important uniformization of the copyright protection of – to name a few -computer programs[46], duration of copyright[47] and protection of databases[48]. These directives were followed by more comprehensive ones such as the InfoSoc directive[49] that sets out a common European basis of the rights granted to authors and owners of related rights and a catalogue of non-binding limitations[50]. Multiple regulations are also, for example, ensuring cross-border portability of online content services in the internal market[51] and cross-border exchange between the Union and third countries[52].

The European Commission launched its "Digital Single Market Strategy" and titled its work programme in 2015 "Towards a modern, more European copyright framework"[53] and it thereafter initiated the very actual "Digital Single Market Directive"[54] in 2019. This particular directive includes different topics aiming to facilitate and harmonize various "digital and cross-border uses of protected content"[55]. These practices were in fact not, or not sufficiently, discussed in previous directives. The directive is the first to discuss the issues of fairness in contracts concluded between authors/performers and publishers/media enterprises. It also promotes transparency of information, improvement of licencing practices and the well-functioning of the marketplace for copyright[56].

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[45] Ibid 12.

[46] Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs (codified version), [2009] OJ L 111/16. See also *European Intellectual Property Law* (n40) 298.

[47] Directive 2006/116/EC of the European Parliament and of the Council of 12 December 2006 on the term of protection of copyright and certain related rights (codified version), [2006] OJ L 372/12 amended by Directive 2011/77/EU of the European Parliament and of the Council of 27 September 2011 amending Directive 2006/116/EC on the term of protection of copyright and certain related rights, [2011] OJ L 265/1. See also *European Intellectual Property Law* (n40) 307.

[48] Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases, [1996] OJ L 77/20. See also *European Intellectual Property Law* (n40) 312.

[49] Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonization of certain aspects of copyright and related rights in the information society, [2001] OLJ L 167/10. See also *European Intellectual Property Law* (n32) 315.

[50] *European Intellectual Property Law* (n40) 56.

[51] Regulation (EU) 2017/1128 of the European Parliament and of the Council of 14 June 2017 on cross-border portability of online content services in the internal market, [2017] OJ L 168/1.

[52] Regulation (EU) 2017/1563 of the European Parliament and of the Council of 13 September 2017 on the cross-border exchange between the Union and third countries of accessible format copies of certain works and other subject matter protected by copyright and related rights for the benefit of persons who are blind, visually impaired or otherwise print-disabled, [2017] OJ L 242/1. See also *European Intellectual Property Law* (n40) 327.

[53] *European Intellectual Property Law* (n40) 57; Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions
'Towards a modern, more European copyright framework', (9.12.2015) COM(2015) 626 final.

[54] Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC, [2019] OJ L 130/92.

[55] Ibid art 1 para 1.

[56] *European Intellectual Property Law* (n40) 330-335.

Today, even if the harmonization process is not completed within the EU, the CJEU is gradually providing, when answering to copyright questions to national courts, a more complete vision of what European copyright law is.

## 3.2 The conditions for protection

In order to receive copyright protection, an author has to produce a work that meets all conditions for protection.

The InfoSoc Directive harmonized the member states' legislations regarding the protection of authors and their corresponding works[57]. With application of the rulings in the Levola Hengolo case[58] the works of authorship are worth protecting if the authorities responsible are "able to identify clearly and precisely the subject matter so protected"[59] and if there is "no element of subjectivity – given that it is detrimental to legal certainty-"[60].

From an international standpoint, originality is an essential requirement for copyright law. In fact, only works showing a minimum amount of originality may obtain protection[61]. Originality is, however, according to Thomas Margoni[62], lacking a precise statutory definition in international law. Nonetheless, in EU law this concept has been harmonized throughout the member states. The condition for copyright protection of works in the EU is commonly defined as "the author's own intellectual creation"[63]. This substantial condition for protection has been stated in CJEU cases such as Infopaq[64] and BSA[65]. This concept was further clarified in the Painer case[66] as needing to reflect the author's personality by producing the work through free and creative choices. This also means that the work has to be the result of an intellectual work that is conscious and, according to Henri Desbois, it has to have "the imprint of the author's personality".

[57] Directive 2001/29/EC (n49) art 2 (a).
[58] CJEU Case C-310/17, *Levolia Hengelo BV v. Smilde Foods BV*, [2018] ECLI:EU:C:2018:899.
[59] Ibid para 41.
[60] Ibid.
[61] Thomas Margoni, 'Artificial Intelligence, Machine Learning And EU Copyright Law: Who Owns AI?' (2018) 2018/12 CREATe Working Paper, 5 <https://eprints.gla.ac.uk/175022/1/175022.pdf> accessed 18 March 2020 .
[62] Ibid 6.
[63] *European Intellectual Property Law* (n40) 342.
[64] CJEU C-5/08, *Infopaq International A/S v. Danske Dagblades Forening*, [2009] ECR-I-6569.
[65] CJEU C-393/09, *Bezpečnostní softwarová asociace - Svaz softwarové ochrany v. Ministerstvo kultury,* [2010] ECR-I-13971.
[66] CJEU Case 145/10, *Painer v. Standard Verlags GmBH and others*, [2011] ECR-I-0000, para 88-89.

The author is granted exclusive rights over his/ her copyrighted works. The concept of what an author entails has hardly been defined in EU law apart from the Database Directive 96/9/EC that defines it as "the natural person or group of natural persons who created the base"[67]. Although this definition gives an indication of what the concept of authorship might entail, is limited to the subject matter of the databases only. Additionally, the harmonization in that particular area is not finalized since, for example, the directive gives Member States the possibility to vest the rights in "the legal person designated as the rightsholder by that legislation" [68].

# 3.3 Rights conferred

The main objective of the Copyright law is to promote creative expressions otherwise societies and economies would not develop at the same pace as they are doing today without conferring ownership of rights to the authors of copyright-protected works[69]. These rights, and more particularly exclusive rights, conferred to the authors are a "core component of copyright law"[70]. They are mainly consisting of a reproduction right[71], a distribution right[72], a rental and lending right[73] and a right to communication to the public[74].

These rights are understandably very important as they give the creators the possibility to decide what they intend to do with their works. Without these rights and the copyright protection of their works, most creators would not feel the incentive to create as they would not gain anything from it; their works would in fact fall into public domain.

[67] Directive 96/9/EC (n48) art 4.
[68] Ibid; *European Intellectual Property Law* (n40) 345.
[69] Yanisky-Ravid Shlomit, 'Generating Rembrandt: Artificial Intelligence, Copyright, And Accountability In The 3A Era — The Human-Like Authors Are Already Here — A New Model' (*ssrn*, 2017) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2957722> accessed 14 April 2020, 662-670.
[70] *European Intellectual Property Law* (n40) 347.
[71] Ibid 347-348 for additional information.
[72] Ibid 348-352 for additional information.
[73] Ibid 352-353 for additional information.
[74] Ibid 353-363 for additional information.

## 3.4 Sub-Conclusion

According to Spider Robinson, "Artists have been deluding themselves, for centuries, with the notion that they create. In fact, they do nothing of the sort"[75]. Logically, if the artist does not create, it cannot protect. In fact, if the artist did not really participate to create the AI-generated work, then the work cannot be copyright protected and the artist cannot either be attributed exclusive rights for it.

This is where the notion of public domain becomes interesting. In fact, works that are "ineligible for copyright protection"[76] will end up in public domain. This means that they are available to everyone since the author does not have any ownership of rights over its work. The concept of originality is tightly embedded in the prementioned idea. Consequently, a work which is not considered to be original will fall into public domain and the author will not get any copyrights[77].

It would be rather interesting to study the applicability of the beforementioned copyright law principles to works generated by autonomous AI-systems.

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[75] Jessica Litman, 'The Public Domain' (1990) 39 Emory L J 965, 1.
[76] Ibid 11.
[77] Ibid and see Part 3.2 of this Master Thesis.

# 4 The applicability of European Copyright law to AI-generated works

The fourth chapter of this thesis will look into the issues regarding the ownership and authorship of works (4.1 and 4.2), followed by the ascertainment that AI-works which have been autonomously generated are not original (4.3). A later part will apply the previously mentioned information to AI-systems that are used as tools, in order to consider what could enable a work to be copyrighted or not (4.4). The fourth chapter will be concluded by remarks on the applicability of EU copyright law to AI-generated works (4.5).

## 4.1 Introduction

There are some important implications that can be foreseen when works are created by AIs. According to Francis Gurry "The deployment and use of AI technologies will have implications bother for intellectual property law and policy and the administration of IP systems around the world"[78].

This fourth chapter of the master's thesis will look into the question of whether European copyright law is applicable to works generated by autonomous AI-systems or not.

AI creations are increasingly often becoming autonomous. These intelligent systems are "making their own decisions and, in some cases, even creating independently from direct human interference. The output of some AI systems can even be perceived as creative."[79]

Copyright law is traditionally constructed in such a way that ownership and protection of works are given to human beings. Additionally, works are predominantly considered only to reach originality if they are created by a human[80]. There are therefore issues that cannot be overlooked regarding ownership, authorship and originality.

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[78] 'Artificial Intelligence And Intellectual Property: An Interview With Francis Gurry' (n37).
[79] *Research Handbook On The Law Of Artificial Intelligence* (n29) 515.
[80] 'Artificial Intelligence And Copyright' (n13).

## 4.2 Issues related to ownership and authorship

To my knowledge, the conferral of copyright protection to AI-generated works has never been prohibited. Yet, many countries' legislations are not adapted to this scenario, as only a work created by a human can be protected by copyright[81]. In the United States, the Copyright Office only registers "an original work of authorship, provided that the work was created by a human being"[82]. This is also the case in Australia[83] and multiple European and non-European countries[84].

According to Tatiana Synodinou, AI is autonomously able "to generate ideas and to produce new forms of expression through the use of software which mimics the configuration of human neural networks."[85] The issue is that according to article 2.6 of the Berne Convention[86], the protection "shall operate for the benefit of the author". This generally means that the author has to be a natural person[87].

The fact that AI is capable of producing works is undeniable. WIPO raised various questions on this topic in its Draft Issues Paper regarding intellectual property policy and artificial intelligence[88]. This shows that international organizations and governments are starting to understand the economic, legal and social aspects due to the absence of and/or ambiguities in the legislation of protection for AI-generated works.

Copyright law is always trying to balance two distinct objectives. The first one is to encourage individuals to create original works. The second one is to maintain a certain legal "standard", determining if works will obtain copyright protection or not.

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[81] Ibid.
[82] The Copyright Office of the United States, 'Copyrightable Authorship' (The Copyright Office of the United States, 2017) 4 <https://www.copyright.gov/comp3/chap300/ch300-copyrightable-authorship.pdf> accessed 23 March 2020 ; *Feist Publications v Rural Telephone Service Company* [1991] The Supreme Court of the United States, Inc 499 US 340 (The Supreme Court of the United States).
[83] Acohs Pty Ltd v Ucorp Pty Ltd [2012] FCAFC 16.
[84] 'Artificial Intelligence And Copyright' (n13).
[85] 'Before The Singularity: Copyright And The Challenges Of Artificial Intelligence' (n15) 2.
[86] Berne Convention for the Protection of Literary and Artistic Works (as amended on September 28, 1979).
[87] As explained by Tatiana Synodinou in 'Before The Singularity: Copyright And The Challenges Of Artificial Intelligence' (n15) 3.
[88] World Intellectual Property Office, 'WIPO Conversation On Intellectual Property (IP) And Artificial Intelligence (AI)' (WIPO 2019) WIPO/IP/AI/2/GE/20/1 5 < https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_ai_ge_20/wipo_ip_ai_2_ge_20_1.pdf> accessed 23 March 2020.

The ambiguities regarding AI-generated works are making it very hard for creators to asses "the value of their work in the digital environment"[89]. This is of course problematic as it may induce scepticism in working with- and developing new AI-technologies. The increasing digitalization through for example AI is definitely going to accentuate this issue. A growing number of creators find it hard to know whether their work can be protected by copyright law or not and what the conditions are for its protection. Why would they then invest themselves in creating them? Companies would not either have the incentive to create self-learning algorithms for AI since they might be very pricy to develop[90] and that the companies do not know if the AI's future creations will be protected under copyright law.

For instance, AI is growing in the fashion industry. Retailers are increasingly using this "algorithmic approach" [91] on their websites and they are also using it when creating new fashion collections. In particular in the Yoox[92] case, the companies' designers were actually sufficiently participating in the creative process and this made it possible to consider that the clothes were original. However, the boundaries between the AI's input and the human choices involved are getting ever thinner which makes it more and more challenging for companies to have the certainty that their works will be protected by copyright.

The Directive 2009/24/EC establishes that "A computer program shall be protected if it is original in the sense that it is the author's own intellectual creation. No other criteria shall be applied to determine its eligibility for protection" [93]. A work created by a program originating from the creative input of its creator may therefore gain copyright protection.
Yet, there is an issue with that proposition: AI has evolved in a way that it can, for example through a self-learning-process, produce works autonomously without any input from a human being[94]. The creator of the original computer program is not needed by the AI in the creative process. Also, the AI is going to develop itself and create work in a way that, the said work and original computer program, cannot be seen as original because of their "very inconsequential link to the original creator"[95].

[89] 'Artificial Intelligence And Intellectual Property: An Interview With Francis Gurry' (n37).
[90] Eric David Halsey, 'What Does AI Actually Cost?' (*Medium*, 2017) <https://medium.com/source-institute/what-does-ai-actually-cost-af6a3e5a1795> accessed 23 May 2020.
[91] Giulio Coraggio, 'AI In The Fashion Industry Unvails New Unexpected Legal Issues' (*GamingTechLaw*, 2018) <https://www.gamingtechlaw.com/2018/11/ai-fashion-legal-issues.html> accessed 3 April 2020.
[92] Ibid.
[93] Directive 2009/24/EC (n46) art1 para3.
[94] 'Artificial Intelligence And Copyright' (n13).
[95] Erika Hubert, 'Artificial Intelligence and Copyright Law' (2019) 6.

Consequently, the condition of originality may be the most problematic condition when one wants to assign copyright protection to AI-created works.

## 4.3 Issues related to the originality condition

Most copyright laws in the EU member states are not explicitly requiring anything with regards to the quality, the creator and the form of the work created[96]. Nevertheless, a few concepts about copyright law are generally accepted, such as the one of animals not being able to produce copyright protected works[97]. This means that, predominantly because of the lack of originality, animal-produced creations are falling into public domain. This common rule, even if not directly applicable to AI-systems, is of course interesting to look at as it sets a common ground to what is considered to be an original work in the EU.

Additionally, as seen in the previous part of this thesis, the AI-software is not duplicating and/or mirroring the training algorithm that its creator made. It can therefore not be considered to be a computer program and cannot be copyright protected as such. Only the original AI-software program may get such a protection. This means that the main questions are: "where is the author's "own intellectual creation" in works produced by computers or robots?"[98] and consequently are works generated by AI original?

According to the Infopaq case[99], it is very doubtable that AI would be considered to be the author of a work, as the creative process would have to come from a human being. Additionally, as seen in the Painer case[100], the work needs to reflect the author's personality, through "free and creative choices"[101], in order to be considered original. This is of course hard to prove considering the fact that the link between the human programmer and the AI is not strong enough to admit that the programmer dictates the ultimate expression of the work[102]. The output generated by the AI and the link to the human creators "free and creative choices" [103] is

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[96] *Research Handbook On The Law Of Artificial Intelligence* (n29) 518.
[97] Ibid; Andres Guadamuz, 'Can The Monkey Selfie Case Teach Us Anything About Copyright Law?' (*Wipo.int*, 2018) <https://www.wipo.int/wipo_magazine/en/2018/01/article_0007.html> accessed 11 May 2020.
[98] 'Before The Singularity: Copyright And The Challenges Of Artificial Intelligence' (n15) 2.
[99] CJEU C-5/08 (n64).
[100] CJEU Case 145/10 (n66).
[101] Ibid para 99.
[102] 'Before The Singularity: Copyright And The Challenges Of Artificial Intelligence' (n15) 2-3.
[103] Ibid 3.

therefore under EU legislation, too aloof and the work can therefore not be attributed to the human programmer either.

Additionally, the CJEU has in the past stated that "where the expression of […] components [of a work] is dictated by their technical function, the criterion of originality is not met, since the different methods of implementing an idea are so limited that the idea and the expression become indissociable"[104]. This further upholds the idea that, in order to get copyright protection for a work, there is a need for some sort of human authorship. Thus, the work has to be imprinted with the author's "personal touch"[105].

This means that fully autonomous - and sometimes even partially autonomous - AI-generated works, are firstly not original in the way European copyright law presents it. Secondly, the copyrights can legally neither be attributed to the human programmer nor to the AI. Ultimately, this entails that these types of works are currently not protected under copyright law in the EU[106].

There are however nuances to what have been previously stated. In fact, copyright protection greatly depends on the level of autonomy of the AI-system.

## 4.4 The use of AI as a tool in current EU copyright law

As of today, AI can only be created by the human mind, it may evolve by itself through self-learning processes, but there has to be a human deciding to program the first version of the AI. This is why AI could be considered to be more of a tool, rather than an autonomous creator. In fact, there is always an economic or artistic objective behind the creation of the machine. Additionally, many legal scholars are currently discussing this topic[107] as it is the easiest ways to attribute authorship to the human inventor and/or user of the AI.

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[104] CJEU Case C-393/09 *Bezpečnostní softwarová asociace - Svaz softwarové ochrany v. Ministerstvo kultury*, [2010], ECR-I-13971, para 49; *Research Handbook On The Law Of Artificial Intelligence* (n29) 519.
[105] *Research Handbook On The Law Of Artificial Intelligence* (n29) 519.
[106] Considering the explanations in chapter 3 and the two first parts of chapter 4 of this Master Thesis.
[107] WIPO, 'Conversation on Intellectual Property and Artificial Intelligence' (September 27, 2019) with the participation of AI expert Dr. Daniela Simone from the University College in London.

This first part dealing with human authorship will look into the concept of AI as a tool of human beings (4.3.1), followed by the drawbacks of beforementioned concept (4.3.2) and finally it will end with some concluding remarks (4.3.3).

## 4.4.1 Presentation of the concept

The usage of AI is, according to many scholars, just a means to an end. It is utilized by a programmer and/or company, in order to reach a certain predicted end-product and/or goal. The idea of seeing AI as a tool means that the authorship is attributed to the human programmer/user/owner. Ultimately, this solves the beforementioned issues relating to the lack of originality and the establishment of the relation between the human and the final AI-generated creation. In fact, if the AI is used as a tool, there should not be any issues with getting copyright protection for the work. There are quite a lot of experts who validate this option and some even state that AI is "just another tool in the toolbox of IT experts"[108]. In that particular case, the copyrights could be attributed to either the owner, original programmer or end user of the AI as the end product can greatly vary depending on the user of the program. In fact, according to Marc Botha, AI is often more of a supplementary tool rather than one that replaces the user of the said AI. It has been admitted that a creative algorithm can, under certain circumstances, be identified as an authors' tool rather than as a self-sufficient creator[109].

In order to illustrate this opinion, one could for example think of an artist wanting to create a painting. He or she would start by selecting the colours and the types of tools used and would thereafter put his/her requirements into an AI algorithm used to create the work[110]. The artist would not be able to predict an exact end-result, but he/she would definitely have "contributed to its creation and has some expectations as to what it may look like"[111]. It is the same for photographs where the camera is used in order to create an original work of art[112]. The artist is also able to review the final creation and decide if he/she wants to keep it or make changes to it.

AI can therefore be used as a tool in a creative process. As long as the link between the programmer and the end product is clear and certain, the first would be

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[108] Marc Botha, 'Artificial Intelligence Is Just A Tool' (*Medium*, 2019) <https://towardsdatascience.com/artificial-intelligence-is-just-a-tool-aab880f1bbdd> accessed 9 April 2020.

[109] Margot E Kaminski, 'Authorship, Disrupted: AI Authors in Copyright and First Amendment Law' (2017) 51 UCD L Rev 595.

[110] 'Artificial Intelligence and the Copyright Dilemma' (n14) 435.

[111] Ibid.

[112] Lien Verbauwhede, 'Photographie Ou Utilisation De Photographies D'œuvres Protégées Par Le Droit D'auteur, De Marques Et De Personnes : Les Pièges Juridiques À Éviter' (*Wipo.int*, 2006) <https://www.wipo.int/sme/fr/documents/ip_photography.htm#1.2> accessed 21 April 2020.

considered to be the author of the second and he/she would get copyright protection for it.

## 4.4.2 Drawbacks

The only problem here is that this master's thesis only discusses AI programs capable of taking autonomous decisions. These types of computer programs are generating works independently, even though their primary existence is the result of "human ingenuity"[113].

In fact, according to Daniel Gervais, when the AI is making relevant autonomous choices, the "autonomy threshold has been crossed"[114] and the creations produced by the AI-machine will undeniably fall into public domain.

This means that some types of – fully or sufficiently – automized AIs cannot be considered to be tools anymore, since the human is not sufficiently involved in the creative process of the machine[115].

In fact, as expressed by Kalin Hristov, "[r]andomness, just like autonomously learned behaviour is something that cannot be attributed to the human programmer of an AI machine. As such, the resulting autonomous works are not eligible for copyright protection and fall directly into the public domain"[116].

## 4.4.3 Concluding remarks

IT experts and legal scholars are agreeing on the fact that certain AI-programs are to be seen as tools and that authorship and exclusive rights are therefore to be attributed to the human programmer, owner or in some cases the end user.

The issue arises when the outputs produced by the AI are generated without human intervention. In those cases where the AI is autonomously producing works, the copyright protection cannot be attributed to the human owner/programmer/user and the work does not acquire any copyright protection.

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[113] 'Artificial Intelligence and the Copyright Dilemma' (n14) 436.
[114] Daniel Gervais, 'Can Machines Be Authors? - Kluwer Copyright Blog' (*Kluwer Copyright Blog*, 2019) <http://copyrightblog.kluweriplaw.com/2019/05/21/can-machines-be-authors/> accessed 9 April 2020.
[115] 'Artificial Intelligence And Copyright' (n13).
[116] 'Artificial Intelligence and the Copyright Dilemma' (n14) 436-437.

This is of course an issue since the idea of seeing AI as a tool has very clear limits and can only be applied to more simpler or less advanced types of AI programs. This may not be of a great issue, as most of today's AI-systems are not in any way fully autonomous. Nevertheless, the numbers of partially autonomous AI's are growing, and we are moving towards a promising future where "combination of scientific and technical breakthroughs are bound to lead to an explosion of self-improving artificial intelligence"[117].

Additionally, AI cannot be considered to be a tool within the scope of this thesis, as this concept cannot be extended to autonomous AI programs that are creating works without (or almost without) human contribution.

# 4.5 Sub-Conclusion

Under current EU law, works produced by fully autonomous AI-systems[118], are not original enough and the link between the AI and its human programmer is too weak for them to be considered copyright protected[119]. Furthermore, as seen above, AI is not considered to be a legal entity, it cannot demand ownership over the work it has created[120]. According to the Professor Ole-Andreas Rognstad, this would ultimately result in a "no ownership scenario" for AI generated works[121]. The said scenario means that the work will fall into public domain[122].

This may be an issue considering that creators may not feel an incentive to create AI-based-programs knowing that the works that are generated by the AI will not gain copyright protection. This might slow down the technological evolutions down and impact areas such as start-ups and pharmaceutical companies and, ultimately, the consumers[123].

According to WIPO's General Director Francis Gurry "AI is a new digital frontier that will have a profound impact on the world"[124]. This could be an issue when considering the automatization of the creation of music or the fact that researchers

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[117] *Research Handbook On The Law Of Artificial Intelligence* (n29) 518.
[118] As described and defined in the first chapter of this Master Thesis, that is to "AI's that have reached such a level of automatization that human contribution is either inexistent or trivial to the creative process and/or partially autonomous AI's that already exist today".
[119] 'Before The Singularity: Copyright And The Challenges Of Artificial Intelligence' (n15) 2.
[120] Ibid 3.
[121] Ibid.
[122] As seen in part 3.4 of this Master Thesis.
[123] 'Artificial Intelligence and Copyright Law' (n95) 8.
[124] 'Artificial Intelligence And Intellectual Property: An Interview With Francis Gurry' (n37).

are using AI in the form of for example 3D printers to create or recreate objects and paintings.

Maybe there is a need to look further into European law. Originality may not be the most suitable condition for protecting AI-generated works. As new challenges regarding IP law are starting to emerge, the logical result of this may actually be "an additional layer of IP"[125]. If authorship under the current EU copyright law does not grant a criterion of protection which is sufficient for these types of works, maybe other legal solutions/theories would.

What if, with or without replacing the existing copyright system, authorship and copyright protection would be provided to AI-generated works, regardless of the beforementioned limitations? And what if authorship would be given to the AI itself? Or, maybe, this "additional layer of IP"[126] would entail new suitable rules -a sui generis regime - established specially for AI-generated works[127].

[125] Ibid.
[126] Ibid.
[127] 'Before The Singularity: Copyright And The Challenges Of Artifcial Intelligence' (n15) 2.

# 5 The attribution of exclusive rights: a future solution for the protection of AI-generated works

Future solutions to the lack of protection of certain types of AI-generated works will be further discussed in the next chapter, as this fifth chapter of the master's thesis will rather briefly look into different persons (natural and legal) to whom exclusive rights could be attributed in the future. The fifth chapter will present possible future solutions requiring small to moderate changes in EU copyright law. As seen in the third chapter of this thesis[128], the author of a work usually gets rights conferred to him/her. This fifth chapter will discuss the awarding of exclusive rights to a person (natural or legal), rather than the attribution of the authorship itself and will therefore not look into the attribution of moral rights as such.

This chapter will start with a small introduction on awarding exclusive rights (5.1), it will thereafter be followed by two parts on the attribution of exclusive rights. These rights can either be attributed to a natural person (5.2) or to a legal person (5.3)

## 5.1 Introduction

Under general copyright law, copyrights can be owned by various persons such as legal and natural ones. Concerning AI-generated works, Daniela Simone finds that "[t]he question we need to really think about is whether it's better to think of AI as an author or a creator in its own right, or as a tool of human creators"[129]. In fact, in the first scenario, the authorship would be attributed to the AI-system and, in the second scenario, it would be attributed either to a natural person or a legal person (e.g. a company).

However, it is today impossible to attribute copyrights, and therefore also authorship, to most works generated autonomously by AI-computers[130]. This is

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[128] As seen in Part 3.3 Rights conferred.
[129] 'Conversation on Intellectual Property and Artificial Intelligence' (n107) with the participation of AI expert Dr. Daniela Simone from the University College in London.
[130] As seen in "Part 4.1 Issues relating to ownership and authorship" (fourth chapter of this Master Thesis).

regardless of whether the attribution is given to the AI (as a legal person or non-human actor), another legal person, or to the human programmer, owner or user as of today (natural or legal persons included). This means that if one would want to award exclusive rights to either of these persons, there would be a need for a legislative and/or regulatory change regarding works that are autonomously generated by AI-systems There are many future solutions that could solve the issues regarding the lack of protection of AI-generated works (including the current impossibility to award copyrights to these types of works). Also, regardless of the future solution that may be chosen for the protection of these types of works, the thresholds for copyright protection would most likely have to be lowered and/or changed.

Also, there may not be a great need to attribute authorship, if exclusive rights are awarded to a legal or natural person instead. In fact, authorship and ownership of exclusive rights are legal concepts that can be separated from each other[131]. This is why the attribution of these rights is discussed in this chapter. It could be interesting to see if a person could be awarded with these types of rights which would solve issues related to the protectability of the works.

## 5.2 The attribution of exclusive rights to a natural person

Traditionally, authorship has always been given to the natural person having created the original work[132]. Awarding exclusive rights to the programmer, the user, or the owner of the AI is therefore probably the most obvious choice, when one wants to give copyrights to an AI-generated work. This option would facilitate the protection process, considering that it would be very challenging to give some kind of recognition and rights to a non-human being[133]. In fact, humans have always traditionally been the ones to get the ownership and the copyrights when it comes to the creation of works.

Generally, three possible human parties could claim the copyrights of AI generated works[134]. First there is the owner(s) of the AI, as for instance big companies and investors in the AI sector. Secondly, there is the programmer and finally there is the user(s) of the AI i.e. the multitude of possible end users of the

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[131] 'Exclusive Rights' (*TheFreeDictionary.com*) <https://legal-dictionary.thefreedictionary.com/Exclusive+rights> accessed 24 May 2020.
[132] *Research Handbook On The Law Of Artificial Intelligence* (n29) 519.
[133] Apart from the situations presented in the second part of this chapter.
[134] 'Artificial Intelligence and the Copyright Dilemma' (n14) 443.

AI[135]. The copyrights and the authorship should be attributed to the best possible human actor, depending on which authorship would "benefit the most to society"[136].

In my opinion, and as it will be presented in the following parts, the exclusive rights should predominantly be awarded to either the programmer or the owner of the AI program. In fact, the end users are not contributing to a sufficient extent to the "initial development of the AI [which makes] their claims for authorship [the] least compelling"[137] of the three. The user may, however, be the best suitable author for works when the AI-system is used as tool in the process of creating a work[138]. The authorship, and following the same logic, the exclusive rights are to be attributed to the major contributors to the development of the AI sector[139] as well as to the most fit to actually control and take responsibility for the actions realized by the AI program.

# 5.3 The attribution of exclusive rights to a legal person

The exclusive rights over a work could likewise be attributed to a legal person such as a company or a firm (5.2.1). Another, more pioneering solution would be to attribute the rights to the AI-system itself (5.2.2).

## 5.3.1 Exclusive rights awarded to a legal person

A legal person is "a body of persons or an entity (as a corporation) considered as having many of the rights and responsibilities of a natural person and especially the capacity to sue and be sued"[140].

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[135] Ibid.
[136] Ibid.
[137] Ibid 444.
[138] *Research Handbook On The Law Of Artificial Intelligence* (n29) 533; see also for an example of an AI-system used as a tool 'The Painting Fool - About Me' (*Thepaintingfool.com*) <http://www.thepaintingfool.com/about/index.html> accessed 16 May 2020.
[139] Ibid.
[140] 'Legal Definition Of LEGAL PERSON' (*Merriam-webster.com*) <https://www.merriam-webster.com/legal/legal%20person> accessed 17 May 2020.

Legal persons can already today be considered to be the rightsholder of a work[141]. The rights are traditionally deemed first to have belonged to the individual author of the work[142]. However, they can (automatically) be transferred to a legal person, for example when the original author has decided decided to do so contractually. It is quite common for firms and companies to detain exclusive rights over various types of copyright-protected works[143].

Ultimately, this entails that a legal person may in some cases acquire, like traditionally a natural person would, the exclusive rights over copyrighted works[144]. The employer (e.g. the company), may for example, in certain cases, get the exclusive rights transferred to itself, when an employee is creating a copyrightable work within his/her employment[145].

Additionally, as seen for example in the Database directive[146], the EU is giving vast possibilities to its member states in the matter of according authorship and copyrights to legal persons. This ultimately entails that, concerning databases, the MSs have the possibility to choose if they want to award exclusive rights to legal persons or not[147]. This gives a future indication that the EU might, as for the database directive, consider that the MS can sovereignly decide if they want to award exclusive rights over AI-generated works to legal persons.

In current EU copyright law, there is no indication that, to reach protectability, the work autonomously produced by an AI would have to follow different rules from the creative work produced by a human. This means that if a legal person wants to get awarded exclusive rights, the work would have to follow the traditional thresholds for copyright law. Consequently, these conditions for protection would have to be lowered and/or changed if one would want to award exclusive rights over these types of works.

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[141] Rainer Oesch, 'The Concept Of Copyright Differs From The Research Integrity Concept Of Authorship' (*Vastuullinen Tiede*, 2018) <https://vastuullinentiede.fi/en/publishing/concept-copyright-differs-research-integrity-concept-authorship> accessed 23 May 2020.
[142] Ibid.
[143] 'Exclusive Rights' (*TheFreeDictionary.com*) <https://legal-dictionary.thefreedictionary.com/Exclusive+rights> accessed 24 May 2020.
[144] In application to what has been discussed in "Part 5.1.2 AI as an employee" of this Thesis work.
[145] This topic will be further treated in the sixth chapter of this Master Thesis 6.1 AI as an employee.
[146] Directive 96/9/EC (n48) art 4.
[147] Ibid para 5, 26 ,30 and art 5.

## 5.3.2 Exclusive rights awarded to the AI

The allocation of exclusive rights to the AI which has autonomously generated an otherwise copyrightable work is a controversial, yet widely discussed, topic within the EU and in various legal documents.

One of the easiest ways of attributing these rights to the AI would, without a doubt, be to attribute legal personality to the AI-machine itself[148]. Law has a very particular way of conceptualizing personhood[149].

As technology is progressing, the question that is increasingly being discussed is "could and should autonomous artificial agents be endowed with legal personhood?"[150]. Extending the rights related to legal personhood to AI machines would demand the adoption of new regulative measures and a wide revision of the "philosophical underpinnings of the legal conceptions of personhood"[151].

The attribution of authorship to AI-systems is not yet possible, but it could be a viable solution in the future. This is why this topic will be further discussed in the sixth chapter of this master's thesis. That chapter will discuss solutions to how AI-generated works could be protected in the future.

# 5.4 Sub-Conclusion

One of the most significant issues when discussing AI-generated works and copyright law, is the one of awarding rights over the work itself. The awarding of the exclusive rights over these types of works to either a human or a non-human is therefore a very central point as to the copyright protection of them. In fact, it would solve the issues regarding the protectability of the works, as all (or some of) the rights deriving from them would be exclusively owned by a defined person or group of persons (legal or natural). The detainer of those rights would for example be able to sell and use the work for a commercial purpose.

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[148] This topic will be further treated in the sixth chapter of this master's thesis 6.4 The attribution of Legal personhood to AI-systems.
[149] *Legal Personhood: Animals, Artificial Intelligence And The Unborn* (n16).
[150] Paul Lambert 'Computer Generated Works and Copyright: Selfies, Traps, Robots, AI and Machine Learning' (European Intellectual Property Review, 2017) 7 and J. Grimmelmann "Copyright for Literate Robots" (101(2) Iowa Law Review, 2016) vii.
[151] Ibid.

There is no indication in EU legislation, nor in the MS's legislation, of the requirements regarding the awarding of exclusive rights over AI generated works. This means that all possibilities are up for debate, even if they may not all be directly transposable into todays' legal and social contexts, especially considering the very particular nature of AI-generated works.

It would, however, be easier to attribute the exclusive rights to either a natural person or a legal person (excluding the AI-system), as these two possibilities are already present in current copyright legislations in the EU. All solutions deriving from rights attributed to these two types of entities would certainly be easier to transpose to copyright law regulations that are in force today. In fact, most of the solutions discussed would only require moderate changes to current EU copyright law.

All these different possibilities of awarding exclusive rights over works that have been autonomously generated by AI-systems are nevertheless only theoretical as most of these works are not protected under current EU copyright law. This is why there is a need for looking at future solutions that would solve the lack of copyright protection for these types of AI-generated works. The sixth and seventh chapters of this Master Thesis will look into how AI-generated works could[152] and should[153] be protected in the future.

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[152] Chapter 6 How could AI-generated works be protected in the future?
[153] Chapter 7 How should AI-generated works be protected in the future?

# 6 How could AI-generated works be protected in the future?

This sixth chapter of the Master Thesis will try to find future solutions to how AI creations could possibly be copyright protected in the future. The solutions of protection are tightly connected to the ideal regime for ownership and awarding of rights. This is why this chapter will partially continue to develop the general ideas that have been presented in the previous chapter.

One may look at AI as a tool that is simply operated by the human utilizing it, as it was presented in the fourth chapter[154] of this master thesis. This is the case for many AI-systems that are utilised today. The solution does, however, not fit the scenario of AIs that are autonomously (fully or mainly) generating works.

This chapter will start with an introduction on the topic (6.1), followed by an overarching presumption that exceptions and/or changes have to be made to the originality condition in order to enable future copyright protection for works generated by autonomous AI-systems (6.2). This chapter of my thesis will present various options for a future solution to the issue regarding the lack of protection of some AI-generated works in the future. First the AI may be considered to be an employee of the programmer and/or the company using it (6.3), second it could also be interesting to look into the United Kingdom's concept of "computer generated works" (6.4). Third, one could also consider AI-systems to be legal persons (6.5). To conclude, these three solutions will be subject to final remarks (6.6).

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[154] See chapter 4, part 4.3 Copyright protection for AI generated works: AI as a tool.

# 6.1 Introduction

AI-created works will necessarily need some kind of copyright protection in the future. If not, programmers, companies and inventors may not find the motivation and incentive to create new programs and invest money in the development of these types of technologies[155].

There is, without any doubt, a wide interest in AI as a whole. The European Parliament has been discussing this subject for the past few years. In 2018, the European Parliament came out with a study called "European Artificial Intelligence (AI) leadership, the path for an integrated vision" requested by the ITRE committee[156]. It is stated in that specific study that Europe is currently investing in AI, by allocating a total of EUR 4 billion to the development of AI to the following Work Programs "2018-2020 Information and Communication Technologies" and "Horizon Public-Private Partnership on Big Data and Robotics"[157].

The Commission has also been writing on that subject on multiple occasions. One publication by the Joint Research Centre (JRC) in 2018[158], marked the increasing importance of AI technologies and the gaps identified in both the copyright and the patent systems. Another one, also published by the JRC, in 2019[159], published a literature review about various subjects linked to AI and copyright law. This second publication gave some inputs on how AI-generated works may be protected by IP law in the future. According to the Commission there is a need to ensure a certain level of protection, but proposals in accordance with possible ways for protection of these works are still too vague[160].

The fact that EU is funding research on the development of AI-technologies must signify that there are commercial, social and economic interests to do so. Following that argument, additional laws and regulations to protect the development of AI will most likely be created in the times to come[161].

According to Andres Guadamuz, copyright law can, for works where there is "minimal or non-existent human interaction, either deny copyright protection or credit authorship of works to the creator of the program"[162]. In my opinion there is

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[155] 'Artificial Intelligence and the Copyright Dilemma' (n14) 438.

[156] Laura Delponte, 'European Artificial Intelligence (AI) Leadership, The Path For An Integrated Vision' (*Europarl.europa.eu*, 2018) <https://www.europarl.europa.eu/RegData/etudes/STUD/2018/626074/IPOL_STU(2018)626074_EN.pdf> accessed 9 April 2020.

[157] Ibid 23.

[158] M Craglia and others, 'Artificial Intelligence - A European Perspective' EUR 29425 EN (Publication Office, Luxembourg, 2018) ISBN 978-92-79-97219-5, doi:10.2760/936974, JRC113826.

[159] 'Intellectual Property and Artificial Intelligence – A literature review' (n3).

[160] 'Artificial Intelligence A European Perspective' (n86) 66.

[161] 'Artificial Intelligence and Copyright Law' (n95) 9.

[162] 'Artificial Intelligence And Copyright' (n13).

a third and final option: the attribution of authorship to the AI through legal personhood.

To my knowledge, and as seen in the previous chapters of this Thesis work, no country in the EU is legally able to consider autonomously AI-generated works as original under copyright law. The attribution of authorship and the awarding of rights over these types of works are therefore impossible as well. This means that copyrights are denied regardless of the beneficiary of these rights. This is why it can generally be considered that these types of works are currently not protected under copyright law and are therefore part of public domain.

Nevertheless, being able to award rights to either a natural or legal person may solve the issues regarding the non-protectability of these works.

## 6.2 What about the originality condition?

As seen in previous parts of my thesis, works which have been autonomously generated by an AI are not copyright protected in the EU. One of the main reasons for this is the lack of originality[163].

The easiest way to solve this issue would, in my opinion, be to create an exception around AI-generated works that would lead to a softening of the originality condition or, maybe even, a removal of this condition for this particular type of works.

This is why all of the solutions that will be presented in the following parts of this chapter are feasible only if the thresholds for originality are lowered or changed in future legislation. This entails that none of them are applicable "as is".

These future solutions all build on the overarching presumption that major changes regarding the originality condition are made in EU copyright law.

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[163] As seen for example in part 4.3 Issues relating to the originality condition and part 4.3 Protection of AI-generated works in current EU copyright law: AI as a tool.

# 6.3 AI as an "employee"

In order to look further into this solution, this part of the Thesis will start with an introduction (6.3.1) and, will then be focusing on the American concept of works made for hire (6.3.2) as well as the concept of copyright law and employment in European member states (6.3.3). There will also be a part on the drawbacks regarding the idea of seeing AI as an employee (6.3.4) and, finally, there will be concluding remarks (6.3.5).

## 6.3.1 Introduction

Traditionally, the copyrights are always attributed to the author of the work[164]. One of the main exceptions to that principle is when the author of the work is creating the work in the scope of his/her employment.

Following that particular exception, what if a company could, fictionally, be considered to be "the employer" of an AI-system[165]? The forthgoing would signify that the protection of the AI generated works could be copyright protected by giving the copyrights to the company or the programmer that is using and/or has created the AI in the first place. In fact, the exclusive rights could be given to the company, as it is coordinating all the efforts and investments around works generated by the AI.

However, this future solution presents a lot of drawbacks as most AI-generated works are not protected neither by the MS nor by the EU copyright law. Consequently, transferring the authorship to the employer may not solve all, if any, of the issues relating to the lack of protection of AI-generated works. Nevertheless, this remains a possible viable solution, if today's thresholds for protection - such as originality - would to be lowered within EU copyright law[166].

This part of the Thesis work will look into American, Swedish and French legislation. As the copyright-systems are a bit different a comparison between these systems could give a better overview of the topic. This could in turn, help finding future solutions regarding the protection of works that have been autonomously produced by AI-systems.

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[164] As for example in the French Code de la Propriété Intellectuelle ("CPI") art L113-1 and the Swedish Lag (1960:729) om upphovsrätt till litterära och konstnärliga verk ("URL") para 1.
[165] 'Before The Singularity: Copyright And The Challenges Of Artificial Intelligence' (n15) the concept of copyright ownership addressed by Professor Ole-Andreas Rognstad.
[166] As seen in part 6.2 What about the originality condition?

## 6.3.2 Works made for hire in the US

AI generated outputs could be seen as "works made for hire" ("WMFH"), as it can be found in US law[167]. In fact, these types of works are considered to be authored by the firm, organization or individual employing the employee[168]. This concept is defined in two parts. WMFH can either be "a work prepared by an employee within the scope of his or her employment"[169] or "a work specially ordered of commissioned for use as a contribution to collective work, […], as a supplementary work, […], as a test, as answer material for a test"[170]. Works made for hire would, for example, include software programs created by an employee within the scope of his/her work[171] and musical arrangements created by employed staff engineers[172]. This particular type of works is protected by US copyright law for a period of "95 years from the date of publication or 120 years from the date of creation"[173].

This solution would made it possible to work around the issue relating to the authorship of AI generated works. Namely, one could look into the concept of AI as an employee, producing works made for hire. Schlomit Yanisky-Ravid presents the idea of WMFH on the model of AI, in an award winning[174] paper from 2017[175]. According to the prementioned, AI systems should be seen as "working for the users"[176] and not as working independently as an "individual". The WMFH doctrine applied to AI systems can be deemed as farfetched, but it is not impossible according to the author of this specific paper[177]. In fact, by giving the control over the works created by the companies' employees, the US Copyright Act is actually giving an incentive to employers to create and innovate in their business area. The responsibility and accountability for the said work and its creator is also transferred to the employer[178].

This doctrine would fit rather well with the concept of AI generated works as the user of the AI and/or its creator would be entitled to "ownership as well as accountability in regard to the works"[179]. With application of the WMFH principle

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[167] US Copyright Act, Section 101 or Title 17 of the U.S. Code.
[168] 'Works Made For Hire' (*Copyright.gov*, 2012) <https://www.copyright.gov/circs/circ09.pdf> accessed 14 April 2020.
[169] US Copyright Act, Section 101 a.
[170] Ibid Section 101 b, point 1, 4, 7, and 8.
[171] 'Works Made For Hire' (n168) 2.
[172] Ibid.
[173] Ibid 3.
[174] Award Winning: The 2017 Visionary Article in Intellectual Property Law, Forthcoming.
[175] 'Generating Rembrandt: Artificial Intelligence, Copyright, And Accountability In The 3A Era — The Human-Like Authors Are Already Here — A New Model' (n69).
[176] Ibid 707.
[177] Ibid 712.
[178] Ibid 711-712.
[179] Ibid 712.

to autonomous AI systems, which would be considered to be creative employees, working for various forms of entities (firms and humans). According to Schlomit Yanisky-Ravid they could be considered as "independent contractors and thus shielded under WMFH doctrine"[180]. This solution would also maintain a certain stability in the legal sphere as it would only necessitate small amendments to the already-existing doctrine and fill out the liability gap that is existing today with regards to AI-programs[181].

## 6.3.3 Works made for hire in the EU

As mentioned in various parts of this work, copyright law is not fully harmonized in the EU. Hence Member States have different laws regarding copyright-protected works created in an employment situation. Nevertheless, there are common provisions to all MS which have actually been harmonized through various directives. Examples of such common provisions are the database directive[182] and the directive for the protection of computer programs[183]. The concept of "deemed authorship" is one of the most central points of these directives when considering works made for hire in the EU. In fact, the person who has created the work according to the MSs legislation, is deemed to be the author of the work[184].

In Sweden, there is no general rule regarding the relation between the employer and the employee in the country's copyright law[185] ("URL"). Employment situations during which an employee is generating works for the employer are instead regulated through jurisprudence[186]. Sweden has partly been inspired by the American principle of works made for hire but is closer to the more European continental principle of "droit d'auteur". In fact, in URL the authorship is always given to the original creator. However, this right may be transferred to the employer through a contract and/or by looking into the particular context related to the creation of the work[187]. The general principle governing this kind of situation is as follows: "the copyright in an employment situation is only transferred to the employer if it is necessary for the production of the companies' normal activities"[188]. Sweden has, as all other MSs, introduced the Directive 2009/24/EG into its legislation. This directive could be interesting to look at when considering

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[180] Ibid 713.
[181] Ibid 716-717.
[182] Directive 2019/790 (n1).
[183] Directive 2009/24/EC (n46).
[184] Ibid art 2 para 1.
[185] Lag (1960:729) om upphovsrätt till litterära och konstnärliga verk.
[186] Marianne Levin, *Lärobok I immaterialrätt* (11th edn, Wolters Kluwer 2017) 125.
[187] Ibid 126-127.
[188] Ibid 127.

the theory of seeing AI as possible employees. With application to the forthgoing, the copyright to computer programs generated by an employee, within the scope of his/her employment or by following orders from the employer, is automatically transferred to the employer (if not other has been contracted)[189]. This would mean that if one would agree to, fictionally, consider AI as an employee, the authorship of all works generated by it would automatically be transferred to the employer. Furthermore, all autonomous evolutions of the AI as a computer program would also fall within the employers' copyrights.

In France, the country of origin for the concept "droit d'auteur", the human creator of a work is always considered to be the original author and beneficiary of copyrights. This means that, even when the employee is creating works within the scope of his/her employment, the company will only get a secondary right over the work[190]. Additionally, the authorship over the work is considered to be of public necessity and there are therefore limitations to how it can be contractually changed and/or transferred to another person and/or entity[191]. One could say that the French "droit d'auteur" is working independently of any employment contract[192].

Following that argument, generally and according to Caron and Lantz: when the employer is using the employees work without acquiring the right to do so by the original author, he/she is actually a counterfeiter[193]. There is therefore a legal void when it comes to employment contracts and French copyright law. There are nevertheless some exceptions to that principle, especially regarding journalists and programmers. Even, the transmission of those rights is very limited and has to be precisely defined[194]. The fact that the "droit d'auteur" is very important in French copyright law makes the secondary transmission of rights complicated. It therefore seems difficult to transfer the copyrights of works generated by AI-systems to the "employer". Therefore, and as seen in previous part of this thesis, if no changes are made to current EU copyright law, the AI-created works seem to remain unprotectable as such.

One may argue that the best solution to that issue would be to lower the originality condition in an "employment context". The exclusive rights over the work could then be awarded to the employer. Additionally, the exclusive rights could also be reduced in time (i.e. lowering the time of protection).

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[189] Ibid 130 and URL para 40a.
[190] Cour de Cassation, Chambre civile 1, du 17 mars 1982, 80-14.838, Publié au bulletin.
[191] Caron Christophe, and Lantz Patrick, 'L'adaptation du droit d'auteur de la création salariée à l'entreprise' (*LEGICOM*, 2003/1 (N° 29), p. 13-24. DOI : 10.3917/legi.029.0013). <https://www.cairn.info/revue-legicom-2003-1-page-13.htm> accessed 16 April 2020
[192] Ibid para 3.
[193] CPI L 111-1 para 3.
[194] CPI L 131-1.

# 6.3.4 AI as an "employee": drawbacks

There are multiple drawbacks when considering the applicability of AI as the "employee" of a company, individual and/or legal entity of any sort.

First and foremost, works autonomously generated by AIs are not protected by copyright law as of today. This entails that transferring the authorship to the employer may not solve all -if any- of the issues relating to the lack of protection thereof. The solution of giving the AI an employee status only solves to issues relating to the awarding of rights over the work and not the originality of it. As presented in the second part of this chapter[195], in order for this solution to be applicable, it would be necessary to make exceptions regarding the originality condition in current EU copyright law. However, the originality criterion has already been extensively harmonized within the EU and it may be difficult to make changes regarding this concept.

Secondly, it is not possible, as of today, to consider AI as a fictional employee and this regardless of the country in question. A new legislation would have to be generated in order for this idea even to be considered. There is also a need to look into the balance between the economic interest of the companies, the incentive to create and the feasibility of such a distinctive legal project. Recognizing AI as an employee could in fact be detrimental to the human employment as computer programs are much cheaper in comparison with a human member of staff. There is no need to compensate the AI and the machine can create works without interruption[196].

Thirdly, most of the principles governing the transfer of authorship to the employer are actually requiring a written contract between the employer and the employee. In the US for example, the parties have to sign a written document in which they have to expressively mention that the work "shall be considered a work made for hire"[197]. This is also the case in European member states such as France and Sweden. This presents a central issue: How can an AI-program consent to the transfer of its authorship to the employer? This does not seem feasible and hence it would be hard to consider the AI as an actual employee.

Fourthly, the legal outcome of implementing such a concept would be very complicated in a country such as France where the employees are generally retaining the copyrights and the authorship themselves.

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[195] As seen in Part 6.2 What about the originality condition?
[196] 'Generating Rembrandt: Artificial Intelligence, Copyright, And Accountability In The 3A Era — The Human-Like Authors Are Already Here — A New Model' (n69) 716.
[197] 'Works Made For Hire' (n168) 1.

Fifthly, and in addition to the fourth point, there is a drawback when considering the legal and author-related effects of the AI creating a work beyond the scope of its employment[198].

Finally, there is an issue regarding who the the owner of the AI-generated work is as the ownership could either be given to the employer or the person using the AI in a said moment. According to Schlomit Yanisky-Ravid the rights should be attributed to "the more efficient entity for controlling these works"[199]. This idea sounds adapted but could still generate inaccuracies and conflicts as it could be quite a debatable concept.

## 6.3.5 Concluding remarks

There are some aspects related to employment that could be interesting further to develop in order to include AI as a creative and "digital employee". Transferring the authorship of AI-generated works to the employer could solve many issues relating to the absence of protection of these works today.

Many scholars are actually looking into that pioneering solution. Nevertheless, most of them are seeing more issues than solutions arising from the fictive employment of AIs. There are indeed many complications regarding originality, legal certainty and adoptability of this concept in the EU, but also in the rest of the world.

# 6.4 The UK concept of computer generated works

This fourth part is following the logic behind the previous part. It will try, through different stratagems, to solve the issue regarding the absence of copyright protection of AI generated works by awarding the protection and the copyrights to the human programmer. This part will attempt to define and apply the legal concept of "computer generated works" to AI generated works in order hopefully to give copyright protection to these very precursive works.

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[198] 'Generating Rembrandt: Artificial Intelligence, Copyright, And Accountability In The 3A Era — The Human-Like Authors Are Already Here — A New Model' (n69) 715.
[199] Ibid 712.

This part will contain a presentation of the concept of "computer generated works" (6.2.1), followed by the drawbacks of this concept (6.2.2) in the United Kingdom (6.2.2.1) and in the EU (6.2.2.2). This part of the Thesis will finally end with concluding remarks (6.2.3).

## 6.4.1 Presentation of the concept

Some European countries, -more particularly the United Kingdom- have taken pre-emptive steps towards attributing the authorship of computer-generated works to the human inventor. The UK has actually created the concept of "computer generated works" ("CGW") which under the UK Copyright, Designs and Patents Act ("CDPA") s178 is defined as follows: ""computer-generated", in relation to a work, means that the work is generated by computer in circumstances such that there is no human author of the work"[200]. This concept is undeniably linked to the idea of AI generated works[201], as these concepts seem to overlap. The forthgoing makes it even more interesting to look into the UK legislation concerning computer generated works. Many copyright laws in the UK have been expanded in order to fit our ever more digitalized society through concepts such as the one of CGW. Furthermore, the original reason for creating this concept was to solve a problem that is still arising in the EU and major parts of the world. Indeed if "something is produced by a natural force by non-human intervention then that product cannot be a 'work' for a work requires the presence of an author"[202].

According to Professor Lionel Bently (and as also stated in the CDPA[203]) under this particular copyright regime, the ownership of CGW belongs to the "person who undertook the arrangements necessary for its creation, the term of protection is limited to 50 years, and no moral rights are recognized"[204]. The prementioned is present in UK copyright legislation, which states that "In the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken"[205].

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[200] UK Copyright, Designs and Patents Act 1988, Section 178.
[201] AI, as defined in this thesis, is a computer program which generates works autonomously. These works are therefore not original. Additionally, there is no possibility to attribute any authorship to the works created.
[202] Clark and Smyth, *Intellectual Property Law in Ireland* (Dublin: Butterworths, 1997), p. 252.
[203] UK Copyright, Designs and Patents Act 1988, Section 12 (7).
[204] 'Before The Singularity: Copyright And The Challenges Of Artificial Intelligence' (n15) the concept of computer generated works presented by Professor Lionel Bently.
[205] UK Copyright, Designs and Patents Act 1988, Section 9 (3).

This means that authorship as well as copyright protection can be given to the person that, by following the prementioned definition, created a computer capable of generating artistic works. In the Nova Productions Ltd v Mazooma Games Ltd Case[206], it was held that a computer which is producing individual frames shown on the screen when playing a computer game is considered to have created a CGW[207]. In that particular case, the author of the frames was consequently deemed to be the person who had defined the rules and logic behind their creation.

This concept is very interesting as it could provide a viable solution for handling the copyright protection of AI generated works in the EU. Additionally, UK legislation has similarities to the legislation of the EU and its member states as the first has been part of the second for multiple decades. In fact, this would be a good future solution for protection as the rights and protection would be awarded to the programmer of the AI. Most MSs would probably be see this solution as logical and understandable.

This solution presents similarities to the third part of this chapter, the main idea being to award copyrights and protection to a person (legal or natural), that arranged for the AI to create the work in the first place. However, this second solution may be easier to transpose as it would reattribute the rights to the programmer that actually created the AI which may be seen as a quite logical option.

Nonetheless, there would be a need to make exceptions from the originality condition for protection. The thresholds for originality could therefore be lowered so the programmer only has to prove that he/she is the original creator of the AI-system. Also, the time of protection and the exclusive rights could all be reduced in order not to distort competition. The human programmer would also be liable for the AI-systems and the works they produce.

## 6.4.2 Drawbacks

There are however drawbacks to the implementation of that solution in the UK (6.2.2.1) as well as in the EU member states (6.2.2.2).

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[206] UK Court of Appeal, Nova Productions Ltd v Mazooma Games Ltd [2007] EWCA Civ 219 (14 March 2007).
[207] Nicola Laver, 'Computer Generated Works: What Are They And Who Owns Them? - Inbrief.Co.Uk' (*InBrief.co.uk*) <https://www.inbrief.co.uk/intellectual-property/computer-generated-works-copyright/> accessed 20 April 2020.

## 6.4.2.1 In the UK

There are issues, even in the UK, when one wants to give copyright protection to AI generated works. According to J. Grimelmann copyright law seems frequently to ignore robots[208]. It is therefore more important than ever to find out if the definition of CGW also fits the autonomous activities of AI. In fact, the UK Copyright legislation neither excludes nor includes AI generated works in the given definition of CGW[209].

Furthermore, the "arrangements necessary" for the creation of the work may not include the creation and development of the AI and/or automated robot. Even if the prementioned would to be included in the definition, "there is still scope to separate or rather distinguish the arrangement qua device from the operation of the device"[210]. There might, according to Paul Lambert, be a difference between the building of the AI-device and the undertaking of "autonomous creative actions"[211] by the AI-machine. This would, doubtlessly, complicate the use of the CGW-concept to the protection of AI-generated works. The Irish Copyright and Related Rights Act 2000 defines CGW as meaning "that the work is generated by computer in circumstances where the author of the work is not an individual"[212]. This provision gives a wider definition of CGW than the one in the UK and seems, according to Paul Lambert, to suggest that "there can be a work created but without an actual individual being present"[213]. However, despite the supposed widening of the definition, some aspects relating to the concept of "arrangements" unfortunately remain unclear[214].

## 6.4.2.2 In the EU

The usefulness of the UK's provisions on computer-generated works as a model to protect AI creations has been rather discussed by European scholars in papers and during summits and conferences. Professor Lionel Bently came to the conclusion that the UK regime is not a fitting model for the protection of AI

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[208] 'Computer Generated Works and Copyright: Selfies, Traps, Robots, AI and Machine Learning' (n150) 657.
[209] UK Copyright, Designs and Patents Act 1988, Section 178.
[210] 'Computer Generated Works and Copyright: Selfies, Traps, Robots, AI and Machine Learning' (n150) 8.
[211] Ibid.
[212] Irish Copyright and Related Rights Act 2000, Section 2 and see also the definition of author Section 21(f).
[213] 'Computer Generated Works and Copyright: Selfies, Traps, Robots, AI and Machine Learning' (n150) 8.
[214] Ibid.

generated works[215]. He predominantly described how the concept of CGW is not compatible with the "EU copyright acquis" as such and how it fails to address the issues of originality and legal certainty[216].

In fact, as seen above, the CGW does not give any clarity on the concept of originality of the work created by the AI. This is of course very problematic as it is one of the main conditions for copyright protection. Consequently, the use of that concept within the EU would not solve the core problem of the protection of AI-generated works.

Additionally, the effects and the adaptability of the CGW legislation on AI generated works with the legislation of the UK is unclear, which makes it even harder to see how this concept would work within the EU (where this concept is absent and/or not harmonized). Applying this concept "as is" to European legislation would therefore entail risks for legal certainty within the EU.

## 6.4.3 Concluding remarks

In conclusion, the concept of CGW brings out a very interesting and already conceptualized solution to the awarding of copyrights and protection to the human inventor and/or programmer of a computer generating a work. However, notwithstanding the beforementioned, it cannot be guaranteed that CGW actually are fit and/or extendable to AI generated works. There is in fact no way to say for sure that all types of computer-generated works are included in the protection of CGW[217].

Furthermore, this solution is not really compatible with the EU acquis (unless looking into related rights) and is actually failing to solve the all during originality issue of the work produced.

The main obstacle to the application of the CGW-concept to AI generated works seems to be the amount of unclarities revolving around the overlapping of these two concepts. Only time will tell if there will be a way to adopt a middle ground between no protection and CGW-protection.

Anyhow, in order to apply the CGW-concept in the EU, there would be a need to make changes to copyright rules regarding the protection of works as a whole.

[215] 'Before The Singularity: Copyright And The Challenges Of Artificial Intelligence' (n15) the concept of computer generated works presented by Professor Lionel Bently.
[216] Ibid.
[217] 'Computer Generated Works and Copyright: Selfies, Traps, Robots, AI and Machine Learning' (n150) 11.

# 6.5 The attribution of legal personhood to AI-systems

This part will start with a small introduction (6.5.1) and will thereafter focus on the concepts of attribution of legal personhood (6.5.2) and its applicability to AI-machines (6.5.3), followed by some concluding remarks (6.5.4).

## 6.5.1 Introduction

When new technological developments emerge, there are usually specialists (and even regular citizens) who are impacted by negative outcomes which these new technologies may have on their society[218]. When it comes to development of AI-systems, one could claim that it could generate negative effects on the future of humankind. This could appear through the loss of jobs or the loss of control over AI-computers altogether. In fact, what may happen if the AI-systems become fully autonomous? Or, if "autonomous artificial agents be endowed with legal personhood?"[219].

Questions are therefore starting to rise concerning certain AI-systems. The one which is leading to most discussions is without a doubt the AI present in self driving cars. The control over the driving is increasingly continuously being transferred to the machine instead of the human driver (automated brakes and warning systems). Legally, the human is still considered to be driving the car. However, if the driver is not in manual control over the car, maybe the AI itself or alternatively the company that has created the AI[220], should be seen as the "driver" instead of the human.

Attributing authorship and, subsequently, also exclusive rights to AI-systems could be a future solution to the lack of protection of works that have been autonomously generated by AI-computers. This fifth part of this chapter follows the same logic as the previous, the main condition being that the thresholds for originality are lowered or that an exception is specifically made for AI-generated works[221]. The only difference here is that the copyright would be awarded to a new type of legal person: the AI itself.

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[218] *Research Handbook On The Law Of Artificial Intelligence* (n29) 213.
[219] 'Computer Generated Works and Copyright: Selfies, Traps, Robots, AI and Machine Learning' (n150) vii.
[220] In application to what has been discussed in **"Part 5.1.2 AI as an employee"** and "Part 5.1.1 AI as a tool" of this thesis.
[221] As seen in Part 6.2 What about the originality condition?

## 6.5.2 The concept of legal personality

The modern conceptualizing of the person as described by Locke is that a person stands for "a thinking intelligent being, that has reason and reflection, and can consider itself as itself, the same thinking thing, in different times and places"[222]. This definition is tightly linked to the traditional way of solely seeing a person as a human being.

There is, in addition to the previously mentioned idea, also a more legal way of seeing a person, namely, through the legal concept of "the legal person". This legal entity is predominantly meant to be a "legal fiction"[223], detaining rights and duties rather than a real person. The legal personhood is commonly given to corporations, companies and institutions. Legal personality is in their case absolutely necessary, as they rely on the fact that they will be treated similarly to how a human being would[224]. In order to be considered to have a "legal personhood status, an entity has to be defined as a legal actor with legal capacity"[225]. These legal actors will also have legal obligations and rights as if they were real persons (human beings). This concept is widely spread in the world and entirely accepted and used within the EU.

This "legal fiction"[226] gives inter alia, the capacity for legal entities to be a part in a contract, owning goods and employing persons. The most important legal person in the EU is without a doubt the EU itself. Article 47 of the Treaty on European Union ("TEU")[227] recognizes the legal personality of the Union "making it an independent entity in its own right. The conferral of legal personality on the EU means that it has the ability to: conclude and negotiate international agreements in accordance with its external commitments; become a member of international organisations; join international conventions, such as the European Convention on Human Rights, stipulated in Article 6(2) of the TEU"[228].

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[222] Ibid 5; see also Locke, *Essays Concerning Human Understanding* (Locke 1961) 280.
[223] *Legal Personhood: Animals, Artificial Intelligence And The Unborn* (n16) 15.
[224] Ibid 16.
[225] *Research Handbook On The Law Of Artificial Intelligence* (n29) 215.
[226] As described by Ngaire Naffine in *Legal Personhood: Animals, Artificial Intelligence And The Unborn* (n16).
[227] European Union, Treaty on European Union (Consolidated Version), 7 February 1992, OJ C 325/5.
[228] 'Glossary Of Summaries - EUR-Lex' (*Eur-lex.europa.eu*) <https://eur-lex.europa.eu/summary/glossary/union_legal_personality.html> accessed 23 April 2020.

## 6.5.3 The application of the concept of legal personhood to AI: The electronic personality

Legal personhood is established for humans but can also be considered for animals, or inanimate objects (such as AI) as law is essentially "an artificial pragmatic construct, meant to serve society"[229]. The concept of personhood continuously evolves in order to fit a particular time, place and culture[230]. It is important to note that todays' society has already accepted the establishment of legal personhood rights for "artificial business entities"[231] as for example corporations, foundations and firms. A legal person is also known to have rights and obligations. Amongst these there is the one of actually owning copyright protected works and being legally the author of them.

Then, as seen for example in the Database directive[232] and also in the previous chapter, there are possibilities of giving authorship to legal persons. A MS, deciding to attribute legal personhood to AI-systems will therefore also, under current EU legislation, be able to give the authorship of a database to the AI-system that created it. The attribution of legal personhood does not seem to be harmonized in the EU yet, which means that the MS retains the power to decide if they want to grant a legal personality to AI systems 'electronic personality'.

The above-mentioned is absolutely crucial, as it actually means that a legal person can be the author of a work in the EU. Scholars are increasingly adopting the belief that autonomous AI systems have evolved in such a way that they can produce creative and spontaneous contributions that should lead to the recognition of AI machines as "independent legal entities entitled to legal and commercial rights and duties"[233]. This would entail that, if AI-machines would acquire some kind of legal and/or electronic personality, they would be capable of being the author of the works that they have autonomously been generating. AI would be able to carry out actions under "the legal person umbrella"[234] and have various legal rights, obligations and responsibilities. In other words, they would have a responsibility over the effects resulting from their "own actions or omissions"[235].

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[229] *Research Handbook On The Law Of Artificial Intelligence* (n29) 219.
[230] Ibid 218.
[231] Ibid 219.
[232] Directive 96/9/EC (n48) art 4.
[233] 'Generating Rembrandt: Artificial Intelligence, Copyright, And Accountability In The 3A Era — The Human-Like Authors Are Already Here — A New Model' (n69) 26.
[234] *Research Handbook On The Law Of Artificial Intelligence* (n29) 216.
[235] 'Generating Rembrandt: Artificial Intelligence, Copyright, And Accountability In The 3A Era — The Human-Like Authors Are Already Here — A New Model' (n69) 27.

AI-systems are contributing to various areas and industries such as DNA research, arts, teaching, and medical diagnosis[236]. These systems are performing tasks that are requiring significant social, intelligent and autonomous faculties. These competences can sometimes be compared to the ones of human beings. Some scholars consider that these features entail that they should be treated as "independent entities with legal rights and duties"[237]. Other scholars are of the opinion that AI computers are similar to firms, as they are non-human systems able to acquire legal rights, responsibilities and benefits[238]. The second option is more viable, as the first one still remains too ambiguous in my opinion. The "corporate approach"[239], as explained by Schlomit Yanisky-Ravid, is based on the already existing legal personhood approach that is currently being applied to corporations and companies. This solution is probably the easiest one to apply as there are already jurisprudence and laws on that topic.

The European Parliament has been discussing[240] the topic of granting electronic personhood to "the most sophisticated autonomous robots, that interact with people or other robots independently or can make decisions on their own"[241]. This type of personhood is inspired by the previously mentioned corporate legal personhood.

This would entail that AI computers, that are possessing a legal personality, would acquire ownership over the works they are generating[242]. "[T]he AI system is the protagonist: when it acts autonomously, it is the true creator or producer of the products. In this case, the owner might be the AI system itself"[243]. Additionally, giving legal personality to AI systems would solve issues such as liability- and tax-issues that are, even though they are not discussed in this thesis, currently under discussion all over the globe[244].

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[236] *Research Handbook On The Law Of Artificial Intelligence* (n29) 229.
[237] 'Generating Rembrandt: Artificial Intelligence, Copyright, And Accountability In The 3A Era — The Human-Like Authors Are Already Here — A New Model' (n69) 27.
[238] Ibid.
[239] Ibid 29.
[240] Resolution 2015/2103 (INL), issued on February 16, 2017.
[241] Migle Laukyte, 'AI as a Legal Person' (University Carlos III, Madrid) 2.
[242] 'Generating Rembrandt: Artificial Intelligence, Copyright, And Accountability In The 3A Era — The Human-Like Authors Are Already Here — A New Model' (n69) 30.
[243] Ibid.
[244] Ibid.

## 6.5.4 Drawbacks

Some scholars have been criticizing the idea of giving legal personhood to AI in a copyright law perspective. It might in fact be an "untenable proposition"[245].

First, the copyright regimes with the EU member states are, at least for now, not leaving any possibility for the attribution of ownership to AI-machines and, according to Madeleine de Cock Buning[246], "it seems unlikely that attribution of rights to machines will be considered within copyright domain shortly"[247].

Secondly, there are issues regarding the length of copyright protection. In fact, copyright protection in the EU is traditionally limited in time and is usually "designed after the life of the creator"[248]. AI systems are not mortal which makes it harder to apply traditional copyright law to AI generated works. One solution could simply be to add a specific timeframe to the current legislation, defining when and how AI-creations are benefitting from copyright protection.

Thirdly, The European Economic and Social Committee seems to reject the idea of attributing legal personhood to AI[249] as it would have major effects on liability law and would possibly generate a "moral hazard and new opportunities for abuse"[250]. It could have great effects on how today's society is perceiving law and ethics.

Fourthly, scholars and lawyers who are opposed to granting legal personality to AI argue that even if the machine is autonomous, it lacks "critical human qualities [such as] consciousness, feelings, intentionality, desires, interests, creativity"[251]. Some argue that "simulation of a thing is not the thing itself"[252], meaning that AI is not to be compared to the human mind.

[245] 'Generating Rembrandt: Artificial Intelligence, Copyright, And Accountability In The 3A Era — The Human-Like Authors Are Already Here — A New Model' (n69) 31.
[246] *Research Handbook On The Law Of Artificial Intelligence* (n29), Chapter 19: Artificial Intelligence and the creative industry: new challenges for the EU paradigm for art and technology by autonomous creations, written by Madeleine de Cock Buning 511-535.
[247] Ibid 530.
[248] Ibid.
[249] Opinion of the European Economic and Social Committee on 'Artificial Intelligence – The consequences of artificial intelligence on the (digital) single market, production, consumption, employment and society,' own-initiative opinion, 2017/C 288/01, < https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52016IE5369 > accessed 27 April 2020.
[250] 'AI as a Legal Person' (241) 2.
[251] Roman Dremliuga, Alexey Yu. Mamychev and Pavel Kuznetcov, 'Criteria for Recognition of AI as a Legal Person' (August 20, 2019) Journal of Politics and Law Vol. 12, No. 3; 2019 ISSN 1913-9047 DOI: 10.5539/jpl.v12n3p105, 106.
[252] Ibid.

Fifthly, granting legal personality to AI systems could possibly create a "double loophole". According to Ugo Pagallo[253], it could lead to two distinctive risks. First, humans could possibly use AI in order to bypass liability and secondly, AI could abuse of human rights[254].

Finally, according to Ole-Andreas Rognstad, there is no real solid incentive nor justification to attribute legal personality to AI systems[255].

# 6.5.5 Concluding remarks

AI is not – as of today – considered to be a legal entity. If the authorship can neither be given to a human author nor to a legal person (such as an AI-system), the result would without a doubt be a "no ownership scenario"[256].

One solution to that issue, would be to attribute the authorship to the AI-system itself. The easiest way to do so would be to attribute legal and/or electronic personhood to AI-systems, the works of which cannot be protected under the general conditions of copyright law.

This solution is dividing scholars in three distinctive groups. The first group is against AI authorship because of its many drawbacks. The second considers AI to be detaining similar features to humans (intelligence and autonomy for example) and finds that they should therefore have a legal personality attached to them. The third group finds that there are a lot of points in common between AI and corporations. They would therefore like to use the corporate approach of legal personality and adapt it to the AI context. Giving legal personality to AI-systems is a widely debated and unresolved discussion that would in fact predominantly involve ethical and moral discussions. Giving legal personhood to AI would entail a lot of changes within society and this solution has been considered by EU institutions in the past. However, it seems that such a change would be a bit ahead of its time should it be set into motion today.

No definite answer nor argument can be given on whether electronic personality is the best option for the copyright protection of AI-generated works or

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[253] Ugo Pagallo, 'Vital, Sophia, and Co.-The Quest for the Legal Personhood of Robots' (September 10, 2018) MDPI DOI: 10.3390/info9090230 < https://www.researchgate.net/publication/327567440_Vital_Sophia_and_Co-The_Quest_for_the_Legal_Personhood_of_Robots>.
[254] 'AI as a Legal Person' (241) 2.
[255] 'Before The Singularity: Copyright And The Challenges Of Artificial Intelligence' (n15) the concept of ownership over AI generated works presented by Professor Ole-Andreas Rognsad.
[256] 'Before The Singularity: Copyright And The Challenges Of Artificial Intelligence' (n15) the concept of ownership over AI generated works presented by Professor Ole-Andreas Rognsad.

not but, one thing is sure, it could be a viable option in the quest for attributing authorship to the AI system. In fact, autonomous AI agents could, as previously considered, be granted legal personhood. It would be quite easy to transpose that idea, as only small legal changes would have to been conducted in most EU member states. Also, the member states could easily take inspiration from their national corporate personhood laws and jurisprudence[257].

The question remains: should AI-systems be endowed with such legal personality, considering the drawbacks discussed above[258] and also the fair number of detractors from this solution?

# 6.6 Sub-Conclusion

This part of the Thesis presented three options that aimed at allocating rights and protection to persons (legal and natural) in order to enable the protection of AI-generated works. There was a possibility to consider the AI as an employee, as a computer generating works and finally as a legal person. These topics gave a clearer insight on possible solutions and/or concepts regarding the copyright protection of AI-generated works. These solutions can, for the most part, be found in various national legislations and also give a wider perspective on AIs' presence in the world of today. The condition for these solutions to actually be conceivable in the future, is to re-evaluate the condition of originality. It could e.g. be lowered or an exception could even be made for these types of works.

After having considered all three of these parts, none of them really stands out as the better solution. In fact, all the propositions have disadvantages that might outweigh the advantages they present for AI-generated works in the future.
The issues that arose in the two first parts were predominantly linked to the fact that those types of works could not be attributed to any author as there was no connection between the owner, programmer or user, and the generated work. Also, the implementation of either one of the three solutions would need significant legal and ethical changes.

As for the third part, it was presented that many scholars are defending the idea of granting legal personality to AI systems. In fact, electronic personality would solve the current issues regarding the lack of relation between the "author" and the end-work produced. However, this concept has also been receiving a lot of criticism.

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[257] 'AI as a Legal Person' (241) 5.
[258] See "Part 5.2.3 Drawbacks" of this thesis.

According to some, this solution would create issues relating to liability, ethics, legal certainty and legal abuse.

There are also issues, for all three solutions, regarding legal certainty as there is no clear sign of whether rights and protection could be attributed to some of these works, if any. Additionally, it could be hard to characterize which AI program is too automatized to give authorship to the human and which one is "simple enough" to attribute authorship, as the line between those two can be difficult to define.

Furthermore, most of these solutions are not sufficiently compatible with the EU acquis and are for the most part failing to solve the originality issue widely argued about in this thesis. Some legal scholars are therefore increasingly defending the establishment of specific "sui generis" rules that would regulate this very topical subject. Others would like to see the establishing of an electronic legal personality.

Nonetheless, they all present possible viable solutions to the lack of protection of the works that are generated by autonomous AI-computers. They are predominantly drawing inspiration from other countries' legislations which means that they could possibly be implementable.

As a conclusion, one could note that the future solutions, which were presented earlier, are not impossible to transpose to EU copyright law, but there are many legal and societal considerations that have to be looked at. In addition, the EU would have to make major legislative changes or at least some adjustments. The EU institutions would have to lower the threshold for protection significantly, by shifting towards "a more economic and incentive-oriented copyright"[259] (as it is the case in the US). There is no certainty that the EU member states would agree to those changes.

In addition to the abovementioned, one solution still lays before the EU since authorship might not provide sufficient protection to the works generated by AI-systems: the creation of a new sui generis regime[260] (7).

[259] *Research Handbook On The Law Of Artificial Intelligence* (n29) 529.
[260] 'Before The Singularity: Copyright And The Challenges Of Artificial Intelligence' (n15) the concept of the criteria for protection presented by Professor Tatiana Synodinou.

# 7 How should AI-generated works be protected in the future?

This chapter will start with an introduction (7.1), followed by a short presentation of the sui generis database right and how it could be an inspiration for the creation of a new sui generis right for AI-generated works (7.2). The third part of the chapter will discuss which aspects the new sui generis right could possibly contain in order to grant protection to AI-generates works (7.3). Finally, the chapter will end with concluding remarks (7.4).

## 7.1 Introduction

According to Professor Ole-Andreas Rognstad, and, as considered in the 6th chapter of this Master Thesis, allocating ownership to either a human or an AI system through the previously proposed solutions, does not "fit neatly into the EU legal system"[261]. It might be more feasible to adopt a sui generis solution as there would be no need to change existing copyright rules within the EU. The originality criterion is, as seen in previous chapters, very hard to change. In fact, this solution "will not stretch the copyright principles and doctrine more than is necessary and gives flexibility"[262].

The concept of Sui generis can be defined as: "[l]atin for of its own kind, and used to describe a form of legal protection that exists outside typical legal protections -- that is, something that is unique or different. In intellectual property law, for example, ship hull designs have achieved a unique category of protection and are "sui generis" within copyright law"[263].

The seventh chapter of this master thesis will present a solution to how AI creations should be copyright protected in the future, namely by using a new sui generis rule specially developed for AI-generated works.

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[261] 'Before The Singularity: Copyright And The Challenges Of Artificial Intelligence' (n15) the concept of ownership over AI generated works presented by Professor Ole-Andreas Rognsad.
[262] *Research Handbook On The Law Of Artificial Intelligence* (n29) 531.
[263] 'Sui Generis' <https://www.nolo.com/dictionary/sui-generis-term.html> accessed 29 April 2020.

When talking about the protection of works through a sui generis right, it is interesting to mention the EU database directive[264]. This is why the chapter will use the beforementioned as an example. This sui generis right has been developed for databases and it would therefore be unlikely for it to be used for the protection of other types of productions such as AI-generated works. As presented by Professor Guido Noto La Diega, "only the investment in obtaining, verification, or presentation of existing independent materials counts towards the sui generis protection; the resources used to create data are not covered"[265]. It is very clear when reading the database directive that it is, by name, not suitable for protecting works generated by autonomous AIs.

However, some parts could be of great inspiration for a sui generis right, specifically conceived, for AI-generated works.

## 7.2 Taking inspiration from the database directive

The sui generis database rights derive from the EU database directive from 1996[266], that was recently amended in 2019[267]. A harmonized legal framework within copyright and more specifically for databases "contributes to the proper functioning of the internal market, and stimulates innovation, creativity, investment and production of new content, also in the digital environment, in order to avoid the fragmentation of the internal market"[268]. This right has been specially created to protect databases and is therefore not resulting from any general copyright laws[269].

The database directive does not really fit the particular context of AI-generated works. This is why it may be necessary to create a new sui generis protection for AI-generated works. However, this new protection could conveniently find some inspiration from the database directive[270].

This directive gives an example on how the European Institutions created specific copyrights for databases. Ultimately, this gives an insight on how AI-generated works may be protected in the future.

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[264] Directive 96/9/EC (n48).
[265] Conference 'Artificial Intelligence (AI), Data Protection, and Intellectual Property Law in a European context' (n11); see also Directive 96/9/EC (n48) para 39-20.
[266] Directive 96/9/EC (n48).
[267] Directive (EU) 2019/790 (n1). The sui generis right derives more specifically from Chapter III "Sui generis right".
[268] Ibid para 2.
[269] Ibid art 7(4).
[270] Examples of that will be presented in the following parts of this chapter.

# 7.3 A new sui generis protection for AI-generated works

The new sui generis protection would be able to adapt to the challenges ahead as new technologies evolve at a very high pace. Also, it would be able to take into account the AI's particular way of functioning. AI-systems are capable of working entirely autonomously by extracting information from databases and also through own experiences. Additionally, these computers are also increasingly evolving and are detaining comparable assets to human beings (independence, "intelligence", own thought processes, personality, and social competences). Some AIs' are also being built into human- and/or robot-like bodies, which makes them resemble human beings even more.

It could be convenient to look at some aspects of the sui generis database right as they could be of great inspiration for the protection of AI-generated works. Some would maybe even be able to solve major issues touching the copyright protection of these types of works.

Today's copyright regime does not stretch to "include autonomous output, but a specific sui generis regime for EU intellectual property protection is created, other forms of ownership attribution can be considered, including the attribution to the (legal entity if a) creative agent"[271]. This separate sui generis protection could therefore be centred on the attribution of rights to either the producer, the owner or the user of the AI-system[272].

This part will present aspects that the new sui generis right could possibly contain in order to protect AI-generates works. The part will firstly discuss the awarding of rights and protection over the work (7.3.1), followed by the possible removal of the originality condition (7.3.2). Finally, there will be a presentation of additional aspects that may be interesting to include into the new right (7.3.3).

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[271] *Research Handbook On The Law Of Artificial Intelligence* (n29) 532.
[272] 'Before The Singularity: Copyright And The Challenges Of Artificial Intelligence' (n15) the concept of ownership over AI generated works presented by Professor Ole-Andreas Rognsad.

## 7.3.1 The granting of rights and protection

In the EU database directive, the authorship over databases is attributed to "the natural person or group of natural persons who created the base or, where the legislation of the Member States so permits, the legal person designated as the rightholder by that legislation"[273].

This concept could be applied to a new sui generis right for AI-generate works. In fact, this would "address the authorship and ownership issues"[274] that were presented in previous parts of this thesis. The authorship could then be attributed to either natural person(s) or a legal person(s), such as for example the AI-system itself or the company owning the AI. This means, that the question regarding authorship could be kept open so that that all possibilities could either be examined individually by the MS or harmonized within the EU.

Another solution would be to award rights and protection without recognizing an author[275]. In fact, "the recognition of the investment in the creation of the works through AI would allow for them to be protected"[276] without the need of recognizing an author.

## 7.3.2 The originality criterion

The new sui generis rule for AI-generated works could entail different rules from the general copyright laws, with for example the absence of a "originality criterion"[277].

In fact, as seen in previous parts of this thesis, the originality criterion remains one of the biggest issues when one wants to attribute copyright protection to a work autonomously generated by an AI-computer.

It would be much easier to transpose an exception regarding AI- generated works, if this criterion were to be erased within a new sui generis rule and not the general copyright legislation.

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[273] Directive 96/9/EC (n48) art 4(1). See also art 7(4) and art 11 for a more in depth understanding of the differences between the general copyright protection of databases and the sui generis protection of databases.
[274] Celine Melanie A Dee, 'Examining Copyright Protection of AI-Generated Art' (2018) 1 Delphi 37.
[275] Jani Ihalainen, 'Computer creativity: artificial intelligence and copyright' (2018) Journal of Intellectual Property Law & Practice, Vol. 13, No. 9, 728.
[276] Ibid.
[277] As it seems to be the case for the sui generis protection of databases in Directive 96/9/EC (n48) art 7(4).

The removal of the originality requirement or the lowering of thresholds for a work to reach the conditions for originality would, without a doubt, be a convenient solution for protection.

## 7.3.3 Additional aspects

It would be beneficial if the new sui generis rule were to clearly define which works are protected under general copyright law and which ones are protected by the sui generis right[278]. This would indeed promote legal certainty and enable the EU institutions to decide which works should maybe be left aside from the copyright protection altogether.

The terms of protection could also be reduced and/changed in order to fit works autonomously generated by AI-systems[279]. The periods of protection would have to be "in line with rapid technological advancements in the field"[280]. A maintenance of balance on the market and fair competition between human creators and persons (natural or legal) using AI-systems would also be required.

Risks related to liabilities and anti-competitive actions could be reduced by adding specific rules and/or limitations regarding the use of the works and the companies' use of AI-systems[281].

AI-generated works could also be treated differently from general works of art. They could for example be treated as performances[282].

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[278] 'Examining Copyright Protection of AI-Generated Art' (n274) 37.

[279] As it is the for example the case for the sui generis protection of databases in Directive 96/9/EC (n48) art 10.

[280] Ibid.

[281] Ibid.

[282] 'WIPO Dialogue On Intellectual Property And Artificial Intelligence - Second Session' (*Wipo.int*) <https://www.wipo.int/export/sites/www/about-ip/en/artificial_intelligence/call_for_comments/pdf/ms_morocco_bmda.pdf> accessed 29 April 2020.

## 7.4 Sub-Conclusion

As a conclusion, the easiest and probably most fitting solution for the protection of AI-generated works is a sui generis protection.

In fact, such a protection would entail no change to the current copyright law. A sui generis right would also get around most of the ethical, cultural and economic discussions regarding that very controversial subject.

It is clear that a specific sui generis protection would solve issues related to central copyright concepts.

The condition of originality, present in general copyright law, could be unheeded and the ownership of rights could easily be attributed to either a natural person, a group or a legal person.

Finally, there would be a harmonized and clear way to perceive and protect AI-generated works in the EU.

# 8 Conclusion

There has recently been a development on the capacities of AI machines, they are now able to generate works. They have also obtained the capacity to create and innovate in a way that only humans were capable of creating and innovating in the past[283]. Historically, there has always been a need for human involvement to get copyright protection over works. This has been an issue for the development of this legal area, as new systems and machines are being gradually created. These new machines are nowadays, in many ways, contributing to the creation of works of science, art and literature, but all do not all need human presence to do so[284].

Autonomously AI-generated works, as seen in previous part of this thesis, are predominantly excluded from eligibility for copyright protection as they are primarily lacking originality[285]. Copyright protection can only be granted to AI-systems that are fitting the traditional conditions for protection. This entails that works generated by more simple types of AI-computers, used as tools by a human user, owner and/or programmer, may get copyright protection. Accordingly, this means that works produced by -fully or sufficiently autonomous- more evolved AI-systems might not get any protection at all. Consequently, these works will fall into public domain. This means that the copyright system is, as of today, favouring human creation and creativity over digital and/or machine creativity[286].

Considering that the AI-generated works discussed in this thesis, are not falling under current EU copyright protection, it could be argued that there is no real need to protect them[287]. Nevertheless, some scholars and researches, me included, are of the opinion that the copyright system should be adapted to the rise of new technologies such as AI. If not, economic, social and technological issues may arise, not only in the internal market but also worldwide. There might not be a requirement to place an "equal value on human and machine creativity"[288], but some kind of protection should be given to these works. If rights have to be created, consideration would have to be made on how the rights should "be defined and implemented"[289].

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[283] 'Artificial Intelligence and the Copyright Dilemma' (n14) 453.
[284] *Research Handbook On The Law Of Artificial Intelligence* (n29) 533.
[285] This work focuses primarily on AI-generated works, where the AI has reached such a level of automatization that human contribution is either inexistent or trivial to the creative process (see part 1.3 Delimitations/Scope).
[286] 'WIPO Conversation On Intellectual Property (IP) And Artificial Intelligence (AI)' (88) 5.
[287] 'Intellectual Property and Artificial Intelligence – A literature review' (n3) 14.
[288] 'WIPO Conversation On Intellectual Property (IP) And Artificial Intelligence (AI)' (88) 5.
[289] 'Intellectual Property and Artificial Intelligence – A literature review' (n3) 14.

The European legal framework has been continuously adapting itself to accommodate new needs for protection[290]. It now includes computer program[291] and database[292] Directives, which have been enacted in order to follow new technological advancements on the market[293]. This shows a will to remain at pace with new technological evolutions and entails that the EU will probably keep adapting its legal framework to new technologies such as AI-systems.

Exclusive rights and protection could be awarded to a natural person in the future, through human ownership. Copyrights have traditionally always been owned by humans, which makes this option the most natural one. As seen above, there are possible solutions for protection that are used and/or discussed in countries such as the UK and the USA. this can be done by considering the AI as a "fictional" employee or by using the UK concept of CGW. These solutions bring out a lot of advantages, but at least as many drawbacks, since it may be difficult to transpose them to current EU copyright law. Also, the issue relating to the "originality condition" remains unsolved, without any lowering of the traditional thresholds for protection.

The rights could also be attributed to a legal person such as the company owing the AI, or the AI itself. The first one could be considered, even if there are drawbacks to that solution as well. As for the second one, many ethical and societal issues may hinder this option as it would entail the creation of an electronic personhood.

A third, more plausible solution, in the absence of copyright protection for AI-generated works, is the creation of a new sui generis rule. This solution would solve many of the above-mentioned drawbacks and would entail no change of the current copyright laws in the EU. The protection of these types of works will ultimately also have effects on the internal market of the EU as well as the worldwide market. There is, anyways, a need to "bring certainty to an uncertain legal area"[294]. This is for me, the best and most practical solution in protection for works generated by AIs.

The AI creations will continue to fall into the public domain if no new ownership rules or new sui generis rule are created. This might have negative effects on the market. Equally, wrongly implemented rules regarding the protection of these types of works, will definitely also have bad effects on the market. This shows that the adaptation of the current copyright law to AI has to be considered in addition to other aspects.

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[290] *Research Handbook On The Law Of Artificial Intelligence* (n29) 527.
[291] Directive 2009/24/EC (n46).
[292] Directive 96/9/EC (n48).
[293] *Research Handbook On The Law Of Artificial Intelligence* (n29) 527.
[294] Ibid.

Finally, the protection of AI-generated works is maybe not solely dependent on copyright law. National and EU rules concerning unfair competition and investment protection could also be looked at in order to enable the protection of these types of works[295].

[295] 'Before The Singularity: Copyright And The Challenges Of Artificial Intelligence' (n15) 4.

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