THE PROTECTION OF AI-GENERATED WORKS UNDER EUROPEAN COPYRIGHT LAW: TOWARD ADOPTION OF A NEIGHBOURING RIGHTS APPROACH

by

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LL.B., Galatasaray University, 2020

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF LAWS

in

THE FACULTY OF GRADUATE AND POSTDOCTORAL STUDIES

THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

October 2022

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The Protection of AI-Generated Works under European Copyright Law: Toward Adoption of a Neighbouring Rights Approach

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Abstract

Individuals today create works that outperform their qualitative and quantitative capacities, thanks to generative models such as DALL-E and Midjourney, and sometimes even win awards with these works. These intelligent technologies – incorporated by many into their creative endeavours – throw into question the boundaries of copyright law, built as it is upon human creativity.

The unpredictability and autonomous behaviour of AI technologies challenge many of the traditional paradigms of legal systems. The European Union has reacted to these fractures by publishing two Proposals for the AI Act and the AI Liability Directive. The Proposals sketch out a proportionate and future-proof framework for the legal protection of these technologies; but also leave many questions with respect to copyright law unaddressed. This thesis helps to fill this legal gap by analyzing the position of AI-generated works in the EU copyright system, and in so doing, contributes to the European policy-making process.

This research comprises five chapters. Chapter One begins with the introduction to the research question. Chapters Two and Three outline the relevant aspects of AI technologies and Union law, respectively. Chapter Four assesses the compatibility of a number of protection models for AI-generated works within the EU copyright system, analyzing whether these technologies can dethrone the human creator, who is at the center of this system, and discard her from the creative process. Under the European copyright system, the author stamps the works with her personal touch, the protection period is based on her life duration, and moral rights are extensions of her personality. This chapter interrogates how the 'author', the protagonist of copyright law, can disappear in the creative process, as well as how the concepts of ownership and neighbouring rights could correspondingly evolve. Chapter Five, finally, highlights the need for reform in the

legal framework for AI-generated works. It suggests that a *sui generis* neighbouring right regime would provide much needed transparency and proportionality for AI-generated works, which are, in fact, already a part of copyright systems without explicit acknowledgment of the AI contribution.

Lay Summary

This thesis focuses on whether AI-generated output should be protected under the European copyright law and, if so, how its authorship should be defined. This thesis consists of five chapters: Chapters One, Two and Three, respectively, outline the research question, and the relevant aspects of AI technologies and EU law. In this thesis, the term 'AI-generated' is used to refer to 'artworks created by breaking the causality with any human being in the creative process by the autonomy of the AI system.' A key challenge posed by these works is: If the creation cannot be traced back to a human being, how is their author to be identified? Having established the multidisciplinary framework, Chapter Four assesses several options to fill the legal gap. Chapter Five suggests the granting of a new neighbouring right regime for AI-generated works supported by contract law and a registration system, which bypasses the authorship difficulty.

Preface

This thesis is original, unpublished, independent work by the author, Berna Tugce Kucukali.

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List of Abbreviations

AI	Artificial Intelligence
CDSM	Directive 2019/790 of 17 April 2019 on copyright and neighbouring rights in the Digital Single Market
CFR	Charter of Fundamental Rights of the European Union
CIPO	Canadian Intellectual Property Office
CJEU	Court of Justice of the European Union
CS	Computer Science
DL	Deep Learning
ECHR	European Convention on Human Rights
EU	European Union
GDPR	General Data Protection Regulation
IP	Intellectual Property
IPR	Intellectual Property Rights
ML	Machine Learning
OECD	Organization for Economic Co-operation and Development
SACEM	Society of Authors, Composers, and Publishers of Music
TRIPS	Agreement on Trade-Related Aspects of Intellectual Property Rights
UKIPO	United Kingdom Intellectual Property Office
XAI	Explainable Artificial Intelligence
WIPO	World Intellectual Property Organization
WPPT	WIPO Performances and Phonograms Treaty

Glossary

Agent: an autonomous entity which observes the world through sensors and acts upon an environment using actuators and the agent directs its activity towards achieving goals in a rational manner

AI-Generated Work: works created by breaking the causal link with any human being in the creative process, as a consequence of the autonomy of the AI system

Algorithm: the sequence of rules that must be followed to reach an output from an input.

Artificial Intelligence: techniques and approaches, listed in Annex I of the *Proposal for AI Act*, that aim to reproduce the cognitive abilities of a human being

Autonomy*:* the ability to take decisions and implement them in the outside world, independently of external control or influence

Broadcasting: the transmission by wireless means for public reception of sounds or of images and sounds

Film: a cinematographic or audiovisual work or moving images, whether or not accompanied by sound

Generative Art: the artwork that is generated, at least in part, by some process that is not under the artist's direct control

Latent Space: the statistical topography of the aggregated features of the training data, mapped onto a high-dimensional mathematical space

Overfitting: the case where an AI system remembers the dataset rather than generalizing due to higher training on this dataset

Phonogram: exclusively aural fixation of sounds of a performance or other sounds

Phonogram Producer: the person who, or the legal entity which, first fixes the sounds of a performance or other sounds

User: the person who employs the AI system

Acknowledgements

First and foremost, I would like to express my sincere gratitude to Professor Graham Reynolds; for giving me the opportunity to work with him on this project, providing me with constructive feedback, and guiding me throughout my academic journey at the University of British Columbia. His supervision not only deepened my knowledge of the subject matter, but also provided me with great insights on how to perform research.

I also want to thank the kind people of the Peter A. Allard School of Law for the opportunity to undertake my studies at UBC. In particular, a special thanks to Professor Jon Festinger, who is the second reader of this thesis. I am grateful to him for his valuable time reviewing this thesis as well as his enthusiasm in the courses he taught.

Finally, I must express my profound gratitude to Professor Fulurya Yusufoglu Bilgin for supporting me during my time at the Galatasaray University and as I was applying to the LLM program.

Dedication

To my family and those who are like family to me,

1 Introduction

This thesis was not written by Artificial Intelligence (AI). In fact, it could have been, albeit not with an output of the same quality, because AI systems alone still do not have the capacity to write a thesis. Current AI systems can generate numerous works with a single click, such as an article from a single word,[1] an infinite number of images based on a text,[2] or videos from movie images.[3] As a result of this creative capacity, an AI system has been identified as a co-author in recent years.[4] A jurisdiction has even granted an AI system citizenship.[5]

In recent years, the emergence of national strategies,[6] consultations,[7] and proposals[8] has laid the groundwork for legal frameworks for AI technologies. Along these lines, a substantial number of works have been written on the intersection of AI and copyright law.[9] In many cases,

[1] See e.g. "InferKit", online: *Inferkit* <inferkit.com/> [perma.cc/A6EB-D3HF].
[2] Cade Metz, "Meet DALL-E, the A.I. That Draws Anything at Your Command", (6 April 2022), online: *The New York Times* <www.nytimes.com/2022/04/06/technology/openai-images-dall-e.html> [perma.cc/U4T6-B32J].
[3] For how neural networks were used for creating nightmares, horror, graffiti, music, fashion, perfume, cocktails, pizza and chocolate by Dr. Pinar Yanardag and her team see Jennifer Vineyard, "How A.I. 'hallucinations' helped make Westworld's main titles", (4 May 2020), online: *SYFY Official Site* <www.syfy.com/syfy-wire/how-ai-hallucinations-helped-make-westworlds-main-titles> [perma.cc/DDA7-2HNZ].
[4] Sukanya Sarkar, "Exclusive: India recognises AI as co-author of copyrighted artwork", (5 August 2021) online: *Managing Intellectual Property* <managingip.com/article/b1t0hfz2bytx44/exclusive-india-recognises-ai-as-co-author-of-copyrighted-artwork> [perma.cc/5RRB-AP2J].
[5] Zara Stone, "Everything You Need To Know About Sophia, The World's First Robot Citizen", (7 November 2017), online: *Forbes* <www.forbes.com/sites/zarastone/2017/11/07/everything-you-need-to-know-about-sophia-the-worlds-first-robot-citizen/> [perma.cc/RJ42-R3KW].
[6] UK, Office for Artificial Intelligence, *National AI Strategy*, (Guidance), 22 September 2021, online: *GOV UK* <www.gov.uk/government/publications/national-ai-strategy/national-ai-strategy-html-version> [perma.cc/X6MG-WSPA]; CIFAR, "AICAN 2020 CIFAR Pan-Canadian Artificial Intelligence Strategy Policy Initiative - CIFAR.AI", (2020) online: *CIFAR* <cifar.ca/wp-content/uploads/2020/11/AICan-2020-CIFAR-Pan-Canadian-AI-Strategy-Impact-Report.pdf> [perma.cc/XT9Q-ZG3F].
[7] Canada, *A Consultation on a Modern Copyright Framework for Artificial Intelligence and the Internet of Things*, (Ottawa: Innovation, Science and Economic Development Canada) online: <www.ic.gc.ca/eic/site/693.nsf/eng/00316.html#s32> [perma.cc/V6DP-CWQL].
[8] EC, *Proposal for a Regulation of the European Parliament and of the Council Laying Down Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts*, [2021] COM/2021/206 final; EC, *Proposal for a Directive of the European Parliament and of the Council on adapting non-contractual civil liability rules to artificial intelligence*, [2022] COM (2022) 496 final.
[9] See e.g. Ryan Abbott, *The Reasonable Robot: Artificial Intelligence and the Law*, 1st ed (Cambridge University Press, 2020); Ana Andrijevic, "Intelligence artificielle & Propriété intellectuelle : défis et perspectives". Introduction

they build on or reference each other, helping to demonstrate the global reach of the ongoing adaptation process. Meanwhile, the research itself assesses a number of proposals for reform brought forward in this regard, presenting arguments on their drawbacks, and questioning whether European Union (EU) copyright law should be extended to include AI-generated works.

Within the context of this thesis, several reasons exist for European Union law (Union law or *acquis communautaire*) to be preferred as the focal jurisdiction. First, the EU has indirectly addressed the issue. In April 2021, its Parliament and Council published a *Proposal for a*

25; Annemarie Bridy, "Coding Creativity: Copyright and the Artificially Intelligent Author" (2011), doi:10.31235/osf.io/5ru6m; Carys J Craig & Ian R Kerr, "The Death of the AI Author" (2019) SSRN Electron J, online: <www.ssrn.com/abstract=3374951> ; Madeleine de Cock Buning, "Artificial intelligence and the creative industry: new challenges for the EU paradigm for art and technology by autonomous creation" in *Res Handb Law Artif Intell* (Edward Elgar Publishing, 2018) 511; Jean-Marc Deltorn, "Deep Creations: Intellectual Property and the Automata" (2017) 4 Front Digit Humanit, online: <journal.frontiersin.org/article/10.3389/fdigh.2017.00003/full>; J-M Deltorn & Franck Macrez, "Authorship in the Age of Machine Learning and Artificial Intelligence" in Sean M O'Connor, ed, *Oxf Handb Music Law Policy* (Oxford University Press, 2021); Josef Drexl et al, "Artificial Intelligence and Intellectual Property Law - Position Statement of the Max Planck Institute for Innovation and Competition of 9 April 2021 on the Current Debate" (2021) SSRN Electron J, online: <www.ssrn.com/abstract=3822924>; Giorgio Franceschelli & Mirco Musolesi, "Copyright in Generative Deep Learning" (2021) ArXiv210509266 Cs, online: <arxiv.org/abs/2105.09266> arXiv: 2105.09266; Aviv H Gaon, *The Future of Copyright in the Age of Artificial Intelligence*, Book, Whole (Cheltenham, Gloucestershire: Edward Elgar Publishing Limited, 2021); Jane C Ginsburg & Luke Ali Luke Ali Budiardjo, "Authors and Machines" (2020) 34 Berkeley Tech LJ 343; James Grimmelmann, "There's No Such Thing as a Computer-Authored Work- And It's a Good Thing, Too" (2016) 39:3 Colum JL & Arts 403; Andres Guadamuz, "Do Androids Dream of Electric Copyright? Comparative analysis of originality in artificial intelligence generated works" (2017) IPQ 169; European Commission, *Trends and Developments in Artificial Intelligence: Challenges to the Intellectual Property Rights Framework: Final report*, by Hartmann Christian, Jacqueline Allan, The Joint Institute for Innovation Policy & University of Amsterdam, (LU: Publications Office, 2020); P Bernt Hugenholtz & João Pedro Quintais, "Copyright and Artificial Creation: Does EU Copyright Law Protect AI-Assisted Output?" (2021) 52:9 IIC - Int Rev Intellect Prop Compet Law 1190–1216; European Commission Joint Research Centre, *Intellectual Property and Artificial Intelligence: a literature review.* (LU: Publications Office, 2021); Jyh-An Lee, Reto M Hilty & Kung-Chung Liu, *Artificial intelligence and intellectual property* (New York: Oxford University Press, 2021); Florian Martin-Bariteau & Teresa Scassa, *Artificial intelligence and the law in Canada* (Toronto, Ontario: LexisNexis Canada, a member of the LexisNexis Group, 2021); Ana Ramalho, *Intellectual property protection for AI-generated creations Europe, United States, Australia and Japan* (Abingdon, Oxon [UK] ; New York, NY: Routledge, 2022); Martin Senftleben & Laurens Buijtelaar, "Robot Creativity: An Incentive-Based Neighboring Rights Approach" (2020) SSRN Electron J, online: <www.ssrn.com/abstract=3707741>; Bob L T Sturm et al, "Artificial Intelligence and Music: Open Questions of Copyright Law and Engineering Praxis" (2019) 8:3 Arts 115; Jacques de Werra, ed, *Droit d'auteur 4.0: actes de la Journée de droit de la propriété intellectuelle du 22 février 2017 = Copyright 4.0*, Propriété intellectuelle - intellectual property 10 (Genève : Genève ; Zürich ; Bâle: Université de Genève, Faculté de droit c Deep Copyright: Up-and Downstream Questions Related to Artificial Intelligence (AI) and Machine Learning (ML); Schulthess Éditions romandes, 2018); Shlomit Yanisky-Ravid, "Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era - The Human-like Authors are Already Here - A New Model" (2017) 68; Pamela Samuelson, "Allocating Ownership Rights in Computer-Generated Works" (1986) 47:4 U Pitt Rev 1185.

Regulation Laying Down Rules on Artificial Intelligence (*Proposal for AI Act*),[10] and recently in 2022, a *Proposal for a Directive on adapting non-contractual civil liability rules to artificial intelligence* (*Proposal for AI Liability Directive*) (collectively referred to hereafter as Proposals).[11] These Proposals set forth the fundamental concepts necessary to begin; however, they remain open to change and discussion, as the final regulation and directive have not yet come into effect. This thesis will, therefore, be based on the non-binding texts to allow it to begin to adapt the EU legal framework to our era, i.e., of the "Artificial Intelligence of Things."[12] Doing so may contribute to the European policy-making process, which aims to create a platform for further discussion and evolution of opinion.

Second, the discussion on such an emerging global technology must be as inclusive as possible. A specific focus on the EU allows this thesis to take advantage of Union's size, diversity,[13] and technological leadership.[14] As the EU's actions could shape the approach taken by other jurisdictions, this thesis could potentially influence the European policy-making process and those of other international bodies. In addition, in accordance with the flexible character of copyright law, EU law has a tendency to enact Directives[15] that provide freedom to its Member States. This thesis aims to reconcile the inclusive and flexible structure of EU copyright law with the global and ever-evolving characteristics of AI technologies.

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[10] *Proposal for Artificial Intelligence Act*, *supra* note 8.
[11] *Proposal for AI Liability Directive*, *supra* note 8.
[12] Jing Zhang & Dacheng Tao, "Empowering Things with Intelligence: A Survey of the Progress, Challenges, and Opportunities in Artificial Intelligence of Things" (2020), online: <arxiv.org/abs/2011.08612> at 2.
[13] The European Union currently consists of 27 Member States "European Union", online: *European Union* <european-union.europa.eu/index_en> [perma.cc/79AA-DCCB].
[14] See Explanatory Memorandum in *Proposal for Artificial Intelligence Act*, *supra* note 8 at 1.
[15] The EU copyright law consists of 11 directives and 2 regulations, harmonising the essential rights of authors, performers, producers and broadcasters. See "The EU copyright legislation | Shaping Europe's digital future", online: *European Commission* <digital-strategy.ec.europa.eu/en/policies/copyright-legislation> [perma.cc/2JW4-49WR]; the InfoSoc Directive contains a basic legislative code governing the recognition and protection of copyright and neighbouring rights in the Union. Justine Pila & Paul Torremans, *European intellectual property law*, 2nd edition ed (Oxford, United Kingdom: Oxford University Press, 2019) at 221.

Given the present state of the art,[16] AI systems still, to some extent, require human intervention and the works created through their use have already been integrated into copyright systems in a variety of ways.[17] Indeed, partially AI-generated works are already included in these systems, but without disclosure in all cases that they were created with the use of AI.[18] This creates uncertainty and ambiguity in the copyright systems. Some have suggested that humanity will face creations that have been entirely AI generated[19] (i.e., "seed AI"[20] that optimizes algorithms, and collects and processes the data itself). Can and should the European Union copyright system accommodate these creations? Raised by this question and addressed in this thesis, is the need for a more transparent inclusion into the European system of AI-generated works. As I answer the question here, I'll not just address the current state of AI technologies but also their evolving capabilities,[21] as keeping pace with fast-changing technologies is the purpose of EU law.[22]

In this context, the methodology to be employed is a key issue. The thesis will begin with a literature review surveying the solutions proposed[23] for incorporating AI technologies into copyright systems. Considering their rapid development, however, it will build on these to seek a long-term solution consonant with the direction the evolution of these technologies is taking. This

[16] See Chapter 2.4, below.
[17] See e.g. *Copyright, Designs and Patents Act 1988* (UK), s 9(3); « Suryast » (artistic) RAGHAV Artificial Intelligence Painting App & Ankit Sahni, Can 1188619 (01 December 2021) registered; Sukanya Sarkar, *supra* note 4; Beijing Internet Court Civil Judgment, Beijing, 2018, *Feilin v. Baidu*, (2018) Jing 0491 MinChu No. 239 and Guangdong Shenzhen Nanshan District People's Court Civil Judgment, 2019, *Tencent Shenzhen v. Shanghai Yingxin*, (2019) Yue 0305 MinChu No. 1401.
[18] See e.g. Ahmed Elgammal, ""Meet AICAN, a machine that operates as an autonomous artist", (17 October 2018), online: *The Conversation* <theconversation.com/meet-aican-a-machine-that-operates-as-an-autonomous-artist-104381> [perma.cc/N4BH-2H6W] The Article states that the painting has been created by the AI (The Birth of Venus by AICAN), but it also includes the name of the author provided.
[19] Hartmann et al, *supra* note 9 at 106.
[20] See Nick Bostrom, *Superintelligence: paths, dangers, strategies* (Oxford: Oxford University Press, 2014) at 29.
[21] Carys J Craig, "Technological Neutrality: Recalibrating Copyright in the Information Age" (2016) SSRN Electron J, online: <www.ssrn.com/abstract=2852385> at 603; Martin-Bariteau & Scassa, *supra* note 9 at 4.
[22] *Proposal for Artificial Intelligence Act*, *supra* note 8 Preamble, at 3.
[23] European Commission Joint Research Centre, *Intellectual Property and Artificial Intelligence: a literature review.* (LU: Publications Office, 2021).

thesis goes beyond these solutions, in other words, with a normative perspective that allows policy recommendations and amendments to existing recommendations to be made that are not clear extensions of existing law.[24] What copyright law faces with these technologies, in other words, is something quite dissimilar to the other creative contributions it has encountered so far.[25] This creates a particular difficulty for analogies, and this thesis points to a legal gap where their use could be misleading.

The doctrinal research method will be employed to illuminate the fundamental structure of EU copyright law, while analyzing the relevant statutory law, cases, and legal doctrine. In addition, this thesis will examine the policy recommendations made in the context of the Union law and solutions adopted in other jurisdictions[26] to determine whether their transplant into the EU system would be possible. When a jurisprudence employs a specific solution, a comparative analysis will be made between the EU and this exemplary system to determine whether the solution would be appropriate in the EU context.[27]

This thesis is organized in the following way. Chapter One will begin with an introduction.

As AI technology describes a comprehensive "set of sciences, theories, and techniques,"[28] Chapter Two will focus on relevant AI systems and introduce the machine learning (ML) models that are at the center of this research. That these models can learn to draw portraits and compose

[24] See generally Irene Calboli & Maria Lilla Montagnani, *Handbook of Intellectual Property Research Lenses,Methods, and Perspectives* (New York: Oxford University Press, 2020) at 160.
[25] Bostrom, *supra* note 20 at 29; *Contra* Carys J Craig, "The AI-Copyright Challenge: Tech-Neutrality, Authorship, and the Public Interest" (2021) SSRN Electron J, online: <www.ssrn.com/abstract=4014811> at 4.
[26] See Chapter 4, below.
[27] See generally Irene Calboli, "Comparative Legal Analysis and Intellectual Property Law: A Guide for Research" in *Handb Intellect Prop Res* (Oxford University Press, 2021) 46.
[28] Council of Europe, Council of Europe, "Glossary on Artificial Intelligence", online: *Council of Europe* <www.coe.int/en/web/artificial-intelligence/glossary> [perma.cc/ZP6J-M5RK].

songs, optimizing their techniques with each data provided,[29] means that they are capable of becoming more autonomous over time.

Chapter Two aims to provide an understanding of the fundamental distinctions characterizing AI and to allow the reader to contextualize its issues. This chapter will also provide a general framework to help explain the distinction between AI-assisted and AI-generated works. Though much has been written about machines and robots, no harmonized definition of AI-generated work exists. The absence of a definition creates the first obstacle to incorporation of AI output into the legal system. Even though no one-size-fits-all solution is possible, given the variety of AI systems, a general framework can be established in light of a number of intelligent system examples and precedent decisions. Examples from current AI technologies and other generative artworks will illuminate the bifurcation between human-generated and AI-generated works.

Chapter Three will address the underlying structure of European Union copyright law. It will first present three foundational theories of EU copyright law, namely natural rights-based,[30] utilitarian[31] and pluralist theories,[32] the latter of which brings the first two together. It will then illustrate how the EU system, which defines the originality of the work as the "stamp of the author's personal touch,"[33] can also protect anonymous works. The chapter will demonstrate the ways in which EU law places the human creator of an artwork at this system's center, by connecting moral rights to the author's personality and linking the protection term to the author's life span. The chapter will, then, discuss neighbouring rights, where the personal relationship

[29] Ginsburg & Luke Ali Budiardjo, *supra* note 9 at 402.
[30] Pila & Torremans, *supra* note 15 at 78.
[31] *Ibid* at 85.
[32] *Ibid* at 88.
[33] *Eva-Maria Painer v Standard VerlagsGmbH and Others*, C-145/10, [2011] ECR I-12533 *[Painer]* at paras 90-93. *Football Dataco Ltd and Others v Yahoo! UK Ltd and Others*, C-604/10, [2012] ECR *[Football Dataco]* at paras 38-39.

between the rights holder and her work is weaker than it would be under authorship. The chapter will, finally, summarize the fundamentals and perspectives of recently adopted Proposals. In this way, it lays out the tension at the core of this thesis and the groundwork for its proposed solution.

Chapter Four will adopt a holistic and global perspective to detail proposed and implemented reforms that integrate AI-generated works into copyright systems. It will introduce the most relevant proposals made, and evaluate them on the basis of their compatibility with EU law, i.e., proportionality, subsidiarity, and better law-making principles given the current state of AI technologies.

The solutions mentioned in this chapter are practical options currently applied in a number of contexts, and have primarily, therefore, been recommended by many authors for the research question posed here. It should be noted that this thesis will not address all proposed and possible arguments but only those which seem most convincing from practical, explanatory, and normative perspectives. The chapter initially outlines solutions that are not within the realm of EU copyright law. These are (i) the granting of legal personality to AI systems, and (ii) the protection of these works within the scope of contract law. The chapter will then outline the solution framing copyright law: (iii) the fall of these works into the public domain. The chapter will then introduce a solution to which many jurisdictions have resorted within the scope of copyright law, i.e., (iv) establishment of a fictional link between the person behind the AI system and the work. One of the exceptional provisions more relevant to EU law before Brexit, Section (9)3 of the *Copyright, Designs and Patents Act 1988* (*UK Act*),[34] will also be addressed in this context. Finally, the chapter will address the solutions within the scope of copyright law that are

[34] See *Copyright, Designs and Patents Act 1988* (UK), s 9(3): '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.'

(v) extension of the derivative works doctrine, (vi) analogy to the work-made-for-hire doctrine, and (vii) neighbouring rights protection.

Each subsection of Chapter Four will evaluate the suggestions outlined within the EU context. Although various solutions from a number of jurisdictions have been proposed, their compatibility with the EU system will affect their adoption here. To contribute to the smoother operation of AI technology within intellectual property (IP) laws, this evaluation will be conducted, not just with a superficial interest in these suggestions, but also in light of impending significant challenges and their likelihood of implementation, through consideration of the ways in which they work in practice. This perspective will allow this thesis to illustrate the discrepancy between the approaches adopted in refusal to register an AI-generated work by the U.S. Copyright Office[35] and the granting of co-authorship to RAGHAV, an AI painting application, by the Indian Copyright Office[36] and the Canadian Intellectual Property Office (CIPO),[37] and the aspects of these practices appropriate to the EU.

Chapter Five will conclude with a discussion and illustration of the ways in which the neighbouring rights might provide flexible and tailor-made protection for AI-generated works.

[35] United States Copyright Office Review Board, "Letter from Copyright Office Review Board, Second Request for Reconsideration for Refusal to Register A Recent Entrance to Paradise (Correspondence ID 1-3ZPC6C3; SR # 1-7100387071), to Ryan Abbott, Esq. counsel for Dr. Stephen Thaler", (14 February 2022), online: <www.copyright.gov/rulings-filings/review-board/docs/a-recent-entrance-to-paradise.pdf> at 3, cited in Ryan Benjamin Abbott & Elizabeth Shubov, "The Revolution Has Arrived: AI Authorship and Copyright Law" (2022) SSRN Electron J, online: <www.ssrn.com/abstract=4185327> at 15.
[36] Sukanya Sarkar, *supra* note 4.
[37] « Suryast » (artistic) RAGHAV Artificial Intelligence Painting App & Ankit Sahni, Can 1188619 (01 December 2021) registered.

2 Overview of Artificial Intelligence

2.1 Introduction

Although the current era has been defined in its terms, "the Artificial Intelligence of Things",[38] there exists no agreed-upon definition of AI.[39] This lack of consensus on a definition, particularly a legal one, prevents the coherent application of legal rules to the concept and creates a significant degree of legal uncertainty in the field.

This chapter aims to concretize the research question and identify its technical components, before posing its associated legal questions. The chapter will first develop a general framework of AI through an analysis of varied AI definitions. In keeping with the challenges for lawmaking posed by their disparity, it will underscore the elements that might be critical for copyright law. Emphasis, for instance, will be placed on the software characteristics of AI systems[40] rather than the degree to which they qualify as robots or machines. Machine learning models that enable these technologies to become more autonomous[41] and unexplainable[42] will then be addressed. The reason for focusing on these AI models will be demonstrated through reference to concepts and subclassifications organizing the field of computer science (CS). An established bifurcation will then be redefined for works created through use of AI systems, in line with the objectives of this thesis: works that are AI-generated versus those that are AI-assisted.

[38] Zhang & Tao, "Empowering Things with Intelligence", *supra* note 12 at 2.
[39] Ryan Calo, "Artificial Intelligence Policy: A Primer and Roadmap" (2017) 51 U.C. Davis L. Rev. 300 at 404, cited in Martin-Bariteau & Scassa, *supra* note 9 at 1.
[40] *Proposal for Artificial Intelligence Act*, *supra* note 8 recital 6.
[41] Ginsburg & Luke Ali Budiardjo, *supra* note 9 at 408.
[42] Avi Rosenfeld & Ariella Richardson, "Explainability in human–agent systems" (2019) 33:6 Auton Agents Multi-Agent Syst 673–705 at 676; But See *Getting from Commitment to Content in AI and Data Ethics: Justice and Explainability*, by John Basl, Ronald Sandler & Steven Tiell, Getting from Commitment to Content in AI and Data Ethics: (Atlantic Council, 2021) at 3.

These will be defined and differentiated. Finally, concrete examples of intelligent systems and other generative artworks will be used to exemplify and clarify the distinction.

2.2 Definition of Artificial Intelligence

Artificial Intelligence is a sub-discipline of computer science founded at Dartmouth College, NH, in 1956 by ten scientists who would later be known as "the founders of AI."[43] It is not an overstatement to say that "it has evolved from a subfield of computer science to a fully-fledged research field."[44]

The term "Artificial Intelligence", coined by computer scientist John McCarthy[45], however, still lacks a consensus on and coherence in, its definition.[46] Several aspects of the field are responsible for this uncertainty. A number of sciences, theories, and techniques as well as approaches and methods are encompassed by its scope, which is wide, vague, and fast evolving. As well, computer science nomenclature is not as meticulous as legal definition.[47] For instance, the terms identifying smart technologies are used interchangeably and conflictingly.[48] This uncertainty mitigates against the uniform applicability of the law and the principle of legal certainty, which is unlikely to be realized without harmonized definitions in legal systems.

[43] Bostrom, *supra* note 20 c Past developments and present capabilities at 5.
[44] Gaon, *supra* note 9 at 52.
[45] Abbott, *supra* note 9 at 21.
[46] Martin-Bariteau & Scassa, *supra* note 9.
[47] See e.g. the naming problem where Python is named after a comedy troupe and Java after coffee. Meredith Broussard, *Artificial unintelligence: how computers misunderstand the world* (Cambridge, Massachusetts London, England: The MIT Press, 2018) at 89.
[48] Woodrow Barfield & Ugo Pagallo, eds, *Research handbook on the law of artificial intelligence* (Cheltenham, UK: Edward Elgar Publishing, 2018) at 21.

Indeed, this situation also runs counter to the achievement of greater "legal certainty to facilitate the investment and innovation in AI" laid down in the EU *Proposal for AI Act*.[49]

It is crucial, then, that this investigation establish just what the term "artificial intelligence" defines, and correspondingly, what the separation of AI-generated and AI-assisted works achieves. For this reason, the terms that have been adopted by the *Proposal for AI Act* will be fundamental to this thesis. I will add to those terms, a key concept from the European Council's Glossary, to arrive at a definition that is most legally compatible to the European system and that will determine this thesis's scope. Reasons for the use of EU law and its terms as a starting point and context have been given, above.

The first definition to be addressed, then, the most recent and relevant to the work here, is that set forward in the April 2021 EU *Proposal for AI Act*, Article 3(1):

> *artificial intelligence system' (AI system) means software that is developed with one or more of the techniques and approaches listed in Annex I and can, for a given set of human-defined objectives, generate outputs such as content, predictions, recommendations, or decisions influencing the environments they interact with.*[50]

The Annex to the *Proposal for AI Act* lists:

> (a)*Machine learning approaches, including supervised, unsupervised and reinforcement learning, using a wide variety of methods including deep learning;*
>
> (b)*Logic- and knowledge-based approaches, including knowledge representation, inductive (logic) programming, knowledge bases, inference and deductive engines, (symbolic) reasoning and expert systems;*
>
> (c)*Statistical approaches, Bayesian estimation, search and optimization methods.*[51]

[49] *Proposal for Artificial Intelligence Act*, *supra* note 8 at 3.
[50] *Ibid* art 3(1).
[51] *Ibid* Annex 1.

The Annex thus tames the variable character of AI systems, described by McCarthy – "as soon as it works, no one calls it artificial intelligence anymore"[52] – by corralling them into three large categories. The Proposal's definition is sufficiently flexible to accommodate technical progress and so is compatible with the rapidly evolving character of AI technologies.[53] As such, the systems defined by the Proposal can easily be amended with a slight change in the Annex. Article 2 of the *Proposal for AI Liability Directive* adopts the same definition by referring to this Article.[54]

The second definition that needs to be taken into consideration is that laid down in the European Council's Glossary on Artificial Intelligence:

> *A set of sciences, theories and techniques whose purpose is to reproduce by a machine the cognitive abilities of a human being.*[55]

What this definition adds is the driving purpose of AI, which is to create "machines that reproduce human cognitive abilities". Because creativity, one of the critical points of EU copyright law, is also a cognitive ability.[56] The capacity of an AI system to reproduce it[57] has significant consequences in terms of copyright law.

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[52] John McCarthy, McCarthy, John, "What is AI? / Basic Questions", online: *John McCarthy* <jmc.stanford.edu/artificial-intelligence/what-is-ai/index.html> [perma.cc/4NRR-CUVW].
[53] EC, Commission, *White Paper on Artificial Intelligence A European approach to excellence and trust*, COM (2020) 65 final (2020) at 16.
[54] *Proposal for AI Liability Directive*, *supra* note 8 art 2.
[55] Council of Europe, *supra* note 28.
[56] Mathias Benedek et al, "Intelligence, creativity, and cognitive control: The common and differential involvement of executive functions in intelligence and creativity" (2014) 46 Intelligence 73–83; Frank Barron, "The disposition toward originality." (1955) 51:3 The Journal of Abnormal and Social Psychology 478–485; Morris I Stein, "Creativity and Culture" (1953) 36:2 The Journal of Psychology 311–322, cited in Werra, *supra* note 9 at 147; Bostrom, *supra* note 17 at 92.
[57] Ginsburg & Luke Ali Budiardjo, *supra* note 9 at 398; Compare Though some authors do not refrain from naming these technologies creative. See e.g. Russ Pearlman, "Recognizing Artificial Intelligence (AI) as Authors and Inventors Under U.S. Intellectual Property Law" (2018) 24:2 Richmond J Law Technol, online: <jolt.richmond.edu/recognizing-artificial-intelligence-ai-as-authors-and-inventors-under-u-s-intellectual-property-law/> at 4; Yanisky-Ravid, *supra* note 9 at 679; Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9; Gaon, *supra* note 9 at 219; de Cock Buning, *supra* note 9 at 514; *AI and the Arts: How Machine Learning is Changing Artistic Work.*, by Michael Osborne Isis Hjorth & Rebecca Eynon Anne Plain, Report from the Creative Algorithmic Intelligence Research Project (UK: Oxford Internet Institute, University of Oxford, 2022) at 52.

For purposes of this thesis, then, the term 'Artificial Intelligence' will refer to the techniques and approaches, listed in Annex I of the *Proposal for AI Act*, that aim to reproduce the cognitive abilities of a human being. In this context, it should be noted that the referred text is a proposal and remains open to change. This definition is, however, precise enough for legal certainty, at least within the scope of this thesis. The following section will detail the machine learning models at the center of this thesis.

2.3 Machine Learning

This thesis will focus on machine learning models, a sub-category of artificial intelligence technologies. Even though ML models represent a subgroup of AI technologies, the fact they form the prerequisites, i.e., *sine qua non*, to functions performed by most other models means that they have rapidly become their driving force.[58] Many routinely encountered AI applications or robotics systems contain machine learning systems. For example, DeepMind's AlphaGo program, which defeated world champion Lee Sedol in the game of Go, was trained with a number of AI methods, including supervised and reinforcement deep learning.[59]

[58] Alpaydin, Ethem, Machine Learning (The MIT Press, 2021), cited in Martin-Bariteau & Scassa, *supra* note 9 at 2; See e.g. the number of articles appearing like "When AI Becomes an Everyday Technology", online: <hbr.org/2019/06/when-ai-becomes-an-everyday-technology>, cited in Sturm et al, "Artificial Intelligence and Music", *supra* note 9 at 1.

[59] David Silver et al, "Mastering the game of Go with deep neural networks and tree search" (2016) 529:7587 Nature 484–489, cited in Littman M. L.et al.., "Gathering strength, gathering storms: The one hundred year study on

The primary process driving ML model is estimation of a general description from a population sample.[60] Essentially, it is out of the question for the machine to 'learn' anything. Rather, the ML algorithm creates a mathematical model from the data presented to it by extracting specific rules from the sample represented by the dataset.[61] Its subsequent output will be generated on the basis of these rules.

Since creators of these intelligent systems take inspiration primarily from the brain, AI neural networks were, and are, built to simulate intelligence.[62] A neural network consists of several layers, each with a different function, connected by weights.[63] The previous layer's output can be the next layer's input;[64] the neural network thus reaches its greatest degree of abstraction at the final layer. This abstraction can be seen in the example of image generation, where the system will initially be trained with a dataset of images with the goal of creation of a novel one based on the qualities it detects from its input. In order to do this, each layer will be charged or appointed to identify a separate feature of the data; one layer will detect edges for instance, with the final layer detecting objects within the image.[65]

The Council of Europe has categorized machine learning models into three fundamental groups: reinforced learning, supervised learning, and unsupervised learning.[66] 'Reinforced learning' models are designed to freely make decisions, reinforced by human feedback.[67]

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artificial intelligence (AI100): 2021 study panel report" (2021) (Stanford Univ: Stanford, CA, USA) online: <ai100.stanford.edu/2021-report>.

[60] Ethem Alpaydin, *Machine Learning* (The MIT Press, 2021) at 32.

[61] An algorithm means "the sequence of rules that must be followed to reach an output from an input." See *ibid* at 14.

[62] *Ibid* at 21.

[63] Stanková, *supra* note 9 at 341; Deltorn & Macrez, *supra* note 9 at 13.

[64] Yoshua Bengio, "Deep Learning of Representations: Looking Forward" (2013), online: <arxiv.org/abs/1305.0445; >, cited in M Beatrice Fazi, "Beyond Human: Deep Learning, Explainability and Representation" (2021) 38:7–8 Theory Cult Soc 55–77 at 58.

[65] Deltorn, "Deep Creations", *supra* note 9 at 4.

[66] Council of Europe, *supra* note 28.

[67] European Commission Directorate General for Communications Networks, Content and Technology & High Level Expert Group on Artificial Intelligence, *Ethics guidelines for trustworthy AI.* (LU: Publications Office, 2019) at 4.

'Supervised learning' models contain datasets that have been labeled and arranged to produce a specific output; 'unsupervised learning' use data that has not gone through a labelling and arrangement process and is thus unstructured. These latter models are built to understand and uncover the hidden or underlying structure of the data fed into them, independent of human direction.[68]

To better understand the place of ML models in copyright law, this section will now explore the feature of these methods that serves the ultimate AI goal: self-training without human input[69] or the progress these models make toward full autonomy. *Autonomy* in the context of AI has been defined as "the degree to which system decision-making is based upon perceptions and internal states rather than the guidance of predefined sequences of action."[70] In February 2017, the European Parliament adopted a resolution with recommendations on civil law rules on robotics (Resolution).[71] In the Resolution, *autonomy* has been defined as "the ability to take decisions and implement them in the outside world, independently of external control or influence."[72]

Autonomy thus refers to a spectrum.[73] Everything from a self-determined specific function to an AI application that develops and evolves its own algorithm can be defined as autonomous.

[68] David Foster & O'Reilly for Higher Education, *Generative Deep Learning*, Book, Whole (O'Reilly Media, Inc, 2019) c Deep Learning.
[69] Fazi, "Beyond Human", *supra* note 64 at 56.
[70] Matthias Scheutz & Charles Crowell, "The Burden of Embodied Autonomy: Some Reflections on the Social and Ethical Implications of Autonomous Robots, Workshop on Roboethics at the International Conference on Robotics and Automation", 1 (2007), cited in Kate Darling, "Extending legal protection to social robots: The effects of anthropomorphism, empathy, and violent behavior towards robotic objects" in *Robot Law* (Edward Elgar Publishing, 2016) 213 at 215.
[71] EC, *European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics*, [2017], (2015/2103(INL)).
[72] *Ibid* para AA.
[73] Mark A Lemley & Bryan Casey, "You Might Be a Robot" (2019) SSRN Journal, online: <www.ssrn.com/abstract=3327602>, cited in Martin-Bariteau & Scassa, *supra* note 9 at 3; But see de Cock Buning, *supra* note 9 at 513 (the author considers autonomy as the extreme on a spectrum).

Some authors use the term interchangeably with the concepts of "automation" [74] and "emergence."[75] The capacity for the computation on its own by a machine learning system, independent of humans, is quite separate from, and should not be confused[76] with, the automation of a problem-solving process.[77]

Several features are responsible for consideration of these models as more autonomous than other AI technologies.[78] Key is that they are programmed to 'learn' action rather than to perform the action directly.[79] This dilutes the connection between 'programmer' and 'system as model' because the model carries out learning activities independently of the programmer's (human) perception. This enhancement of autonomy can extend to configuration of the system weights as the training process continues; [80] such a self-directed evolution can cause the person supervising the AI to lose track of the process. The preference for unsupervised over supervised algorithms is, in fact, another definitive issue for autonomic classification because these systems are designed to create their own labels, and so are independent from those of the AI researcher from the start and can cross a boundary where she can no longer perceive its definitions or concepts.

Another characteristic of enhanced autonomy is the opacity of these systems, which some authors refer to as "black box models."[81] This opacity means that even the code programmer may

[74] Abbott, *supra* note 9 c Artificial Inventors.
[75] Ryan Calo, "Robotics and the Lessons of Cyberlaw" (2015) 103:3 Cal L Rev 52 at 538.
[76] "autonomy | Etymology, origin and meaning of autonomy by etymonline", online: <www.etymonline.com/word/autonomy>. See also Sara Goering, 'Autonomy' in Carl Mitcham, ed, Encyclopedia of science, technology, and ethics (Detroit, MI: Macmillan Reference USA, 2005) at 155 (noting that the concept of autonomy, "like freedom, combines two aspects: the negative condition of freedom from external constraints and the positive condition of a self-determined will"), cited in Daria Kim, "'AI-Generated Inventions': Time to Get the Record Straight?" (2020) 69:5 GRUR International 443–456 at 446.
[77] *An introduction to machine learning* (New York, NY: Springer Science+Business Media, 2019) 1, cited in *ibid*.
[78] Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9 at 10.
[79] See e.g. *Peter Norvig: How Computers Learn* (2015), cited in Werra, *supra* note 9 at 161.
[80] Council of Europe, *supra* note 28.
[81] Kim, "'AI-Generated Inventions'", *supra* note 76 at 453; Begoña Gonzalez Otero, "Machine Learning Models Under the Copyright Microscope: Is EU Copyright Fit for Purpose?" (2021) GRUR Int at 17; Ramalho, *supra* note 9 at 56.

not be able to explain the relationship between input and output.[82] The relationship can often only be comprehended retrospectively, through trial and error. [83]

All technologies are opaque to some extent.[84] The camera mechanism, however, might illustrate the ways in which AI technologies differ from other current technologies. The opacity of an intelligent system to an AI researcher is not the same as a lack of understanding a photographer might have of her camera's inner workings. The working mechanisms of cameras are known to humanity and the person who uses the camera is entitled to authorship based on this knowledge. The opacity of an AI system, however, applies to everyone: it is not just the AI researcher who cannot explain it: no one can.[85]

Underscored by many in the field is the need for explainability (XAI), or the degree to which sub-symbolic information in the machine learning model can be translated into a language comprehensible to human beings.[86] Sub-symbolic information is that acquired by the AI system in its 'training', that is, the connections it draws between components of the information fed to it as it continuously processes the data. These connections may not be those that make the information or image legible to human mind. To the degree that they are not, the system is 'unexplainable'. The explainability can be used to better explain AI system's errors and to perform causal inference.[87] Deep learning models (DL) pose a particular problem in this respect, as obscurity increases with the number of layers in neural networks,[88] and what is "deep" about

[82] Fazi, "Beyond Human", *supra* note 64 at 59.
[83] *Ibid* at 59.
[84] *Ibid* at 61.
[85] "[t]he consequences of the black-box character of deep learning are different because, in this case, it is agency itself (...) that is opaque." *ibid* at 61-62.
[86] Yu-Liang Chou et al, "Counterfactuals and Causability in Explainable Artificial Intelligence: Theory, Algorithms, and Applications" (2021) ArXiv210304244 Cs, online: <arxiv.org/abs/2103.04244> arXiv: 2103.04244 at 3.
[87] Jiaming Zeng, Berk Ustun & Cynthia Rudin, "Interpretable Classification Models for Recidivism Prediction" (2015), online: <arxiv.org/abs/1503.07810>, cited in Sturm et al, "Artificial Intelligence and Music", *supra* note 9 at 7.
[88] Deltorn, "Deep Creations", *supra* note 9 at 5.

these models is the number of layers, an extreme configuration that reduces their intelligibility.[89] The computer science community still does not consider DL models explainable.[90]

Apart from their opacity, these models are also characterized by their capacity for mass production of, e.g., AI-generated text, voice, music, video. There are several reasons for this excessive generation of synthetic media. The primary is provision of access to data. Data can be seen as a panacea for modern technologies, such as tech companies that are fueled by the external data that AI provides rapidly and smoothly, rather than as a method for enhancing the freedom of scientific and artistic expression, the aim of copyright law.[91] Thus, the outputs can be used to feed other AI systems, which improve as they accumulate data.[92]

Second, because the human element, which programmers attempt to eliminate during system training,[93] loses its role as a data source with this technology, the synthetic data generated through its mass production can escape legal obstacles, especially the General Data Protection Regulation (GDPR) or copyright law. The human beings who would have rights to the data, in other words, are excluded from the process.

Third, and finally, a critical limitation of these models is the human data fed into them, which is unavoidably compromised or 'dirty'. A fair and representative dataset is generated when the samples used in model training are truly representative, i.e., unbiased. Unacknowledged in the datasets and algorithms of these models are the curator or coder's perceptions, understandings, confusions, and misunderstandings, which are transferred to, and reflected by, them. When

[89] Fazi, "Beyond Human", *supra* note 64 at 58.
[90] Rosenfeld & Richardson, *supra* note 42 at 676.
[91] Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9 at 13; J Pila, "Pluralism, Principles and Proportionality in Intellectual Property" (2014) 34:1 Oxf J Leg Stud 181–200 at 194.
[92] "Facebook AI Director Yann LeCun on His Quest to Unleash Deep Learning and Make Machines Smarter", (18 February 2015), online: *IEEE Spectrum* <spectrum.ieee.org/facebook-ai-director-yann-lecun-on-deep-learning>, cited in Zeynep Tufekci, "Algorithmic Harms Beyond Facebook and Google: Emergent Challenges of Computational Agency" (2015) 13:203 Colo Tech LJ at 210.
[93] Fazi, "Beyond Human", *supra* note 64 at 62.

human data is at stake, in other words, all of the human prejudices of those manipulating it are involuntarily transferred to AI systems. This data will contain noise and mess and be incomplete. Data not directly acquired from human beings but generated by the systems at the end of their processes is called 'artificial' and the artificial data, fed back into another model, might be necessary for optimization of the system through repeated training processes.

It is, therefore, clear that these autonomous models, with their capacity for mass production, are, and will be, employed so extensively that the extreme difficulty of causality assessment, will corrupt copyright monopoly, a protection that is, in principle, exceptional.[94] This is the core of the problem confronted by this thesis, which will focus on the challenges presented by machine learning models, within the framework described above, to systems of copyright law as they exist and as they can be adapted in the future. Following a summary of the technical components of these intelligent systems, they will then be distinguished according to their outputs from the perspective of copyright law.

2.4 AI-Assisted vs. AI-Generated Works

Apart from existing computer science classifications, briefly explained above, a distinction, of importance to this thesis, is that between AI-generated, and AI-assisted works. The fact that some authors reject this distinction,[95] however, means that harmonized definitions for the two categories have been impossible to arrive at. The lack of a harmonized definition of AI itself further blurs the two concepts. Nevertheless, the distinction itself appears to best conform to the

[94] Mireille van Eechoud & P Bernt Hugenholtz, *Harmonizing European Copyright Law The Challenges of Better Lawmaking.* (Alphen aan den Rijn: Wolters Kluwer Law International, 2009) at 34.
[95] See e.g. Grimmelmann, *supra* note 9; Drexl et al, *supra* note 9.

perspective of copyright law in an interdisciplinary field. This section will assess its pros and cons by referring to the various legal sources that underscore it.

UK *Copyright, Designs and Patents Act 1988* Section 9(3) is the first legal provision that creates the distinction in computer-related works, and is currently valid.[96] According to the definition provided by the UK *Copyright, Designs and Patents Act 1988*, "computer-generated works are the works generated by computers in circumstances such that no human author can be attributed to them."[97] Based on this definition, Section 9(3) stipulates who is to be considered the author of such works.[98] This approach is not, however, universally accepted: some respondents in the artificial intelligence and intellectual property consultation published recently by the United Kingdom Intellectual Property Office (UKIPO) were of the opinion that the provision should be amended.[99] Some authors even argued that this regime was not in substance copyright, but neighbouring rights or unfair competition, protection.[100]

First, although Section 9(3) of the *UK Act* makes no explicit reference to AI systems the term 'computer' is interpreted as covering them.[101] In its infancy, the term was used to define, not the hardware, but the people working with numbers, the first of which were the women who mapped the stars at Harvard University.[102] The meaning of the concept has gradually evolved to its current form, in parallel with the models themselves and functions of modern-day computers.

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[96] *Supra* note 34.
[97] *Copyright, Designs and Patents Act 1988* (UK), s 178.
[98] *Supra* note 34.
[99] UK, Intellectual Property Office, *Government response to call for views on artificial intelligence and intellectual property*, (Consultation outcome), 23 March 2021, online: <www.gov.uk/government/consultations/artificial-intelligence-and-intellectual-property-call-for-views/government-response-to-call-for-views-on-artificial-intelligence-and-intellectual-property>.
[100] Lionel Bently, *Intellectual property law* (New York, NY: Oxford University Press, 2018) at 118, cited in Hartmann et al, *supra* note 9 at 88.
[101] UK, Intellectual Property Office, *Government response to call for views on artificial intelligence and intellectual property*, *supra* note 99.
[102] Natasha Geiling, "The Women Who Mapped the Universe And Still Couldn't Get Any Respect", (18 September 2013), online: *Smithsonian Magazine* <www.smithsonianmag.com/history/the-women-who-mapped-the-universe-and-still-couldnt-get-any-respect-9287444/> [perma.cc/F9WM-RAF7].

Even today, as mentioned, the scope of the provision can, and is, being questioned. Since the definition of AI does not entirely overlap with the concept of 'computer',[103] the term's scope blurs the sphere of application of the provision.

Second, by defining computer-generated works as those without a human author, its definition rests on the ultimate autonomy sought by AI technologies. It is the optimistic, future-oriented approach of a provision written in 1988, describing a situation, which fails to exist, even today. This is a situation that might make the provision inapplicable for a considerable period.[104]

The following chapters will discuss the applicability of this fictional link and its definitional pros and cons to AI systems. This section will further discuss the various definitions created to distinguish AI-assisted from AI-generated works, and the weaknesses and strengths of each.

In the World Intellectual Property Organization (WIPO) Conversation, AI-generated and AI-assisted works are defined and classified as follows:

> *"AI-generated" and "generated autonomously by AI" are terms that are used interchangeably and refer to the generation of an output by AI without human intervention. In this scenario, AI can change its behavior during operation to respond to unanticipated information or events. This is to be distinguished from "AI-assisted" outputs that are generated with material human intervention and/or direction.*[105]

Ramalho and Larrieu also adopted parallel approaches to this classification.[106] In addition, they have defined AI-assisted content as situations where the AI is used as "a tool in the hands of

[103] Chapter 2.2, above.
[104] Hugenholtz & Quintais, "Copyright and Artificial Creation", *supra* note 9 at 1211; See generally *Nova Productions Ltd v Mazooma Games Ltd & Ors* [2006] EWCH 24 (Ch).
[105] World Intellectual Property Organization, "WIPO Conversation on Intellectual Property (IP) and Artificial Intelligence (AI): Second Session", online: <www.wipo.int/meetings/en/details.jsp?meeting_id=55309> [perma.cc/7L8U-4T72] at 4.
[106] Ramalho, *supra* note 9 at 9; Jacques Larrieu, "Chapitre 9. La propriété intellectuelle et les robots" (2013) 24:4 J Int Bioéthique 125 at 128.

human creators."[107] Gaon, on the other hand, described computer-assisted works similarly, and refrained from defining those that are computer-generated.[108]

The machine that acts without human input, envisaged in these definitions, is a remote possibility considering the AI systems' current mechanisms. It implies elimination of every role encompassed by the phrase "*with material human intervention or direction*": e.g., the writing of an algorithm, creation of a dataset, provision of input, modification of system parameters, interpretation of output, and optimization of the system. Clearly, given the current condition of AI technologies, activities on a vast scale fall within the scope of 'human contribution'. Even if an AI system could be developed to write and develop its own algorithm, there would need to be some human intervention at the initial stage. At least, even in cases where a human did not develop the system, a human would need to follow or observe the process, an activity that is almost certainly included under the phrase of "human direction". Indeed, what makes all of this AI advancement meaningful is its observation by a human.

It is unrealistic, therefore, to expect that human contribution will be eliminated completely from the generation of AI output, and to refer to a possibility that would almost certainly not become a current issue dooms the provision to irrelevancy for some time. For purposes of copyright law, however, it is not necessary to rely on, or anticipate, AI systems writing their own algorithms to admit that some AI systems exhibit autonomous behaviour. What is essential for copyright law is the process that created the work, not the AI system itself. Indeed, the way in which a human being learns to create a work is not essential to the application of copyright law.

[107] Ramalho, *supra* note 9; Larrieu, *supra* note 106 at 129.
[108] Gaon, *supra* note 9 at 161.

The grey area left by these definitions is that of an AI system developed by a human but capable of conducting the creative process on its own. In this scenario, the output can be accepted as AI-generated because its generation occurs "without human intervention", but also as AI-assisted, since "human direction" is initially involved. Its capacity to create is human directed; its creation is not. If this example is accepted as AI-assisted, this definition of AI-generated output thus leads, not to further use, but to a conundrum.

As well, the definition ignores output that is generated jointly by humans and AI. As long as the creative human contribution is involved, it relegates the AI contribution to the level of assistant. This contravenes the technological neutrality inherent in acceptance of the co-authorship of two natural persons. This thesis will address the problem, focusing primarily on the practical and familiar possibilities that readers would encounter in their daily experience.

Another definition to be considered here is that proposed by the European Commission, whose Trends and Developments in Artificial Intelligence: Challenges to the Intellectual Property Rights Framework Report (Trends and Developments in Artificial Intelligence Report) refers to "AI-assisted Output" as "*a catch-all term to mean outputs, applications or productions generated by or with the assistance of AI systems, tools or techniques"*.[109]

This is the definition adopted by legal scholars Hugenholtz and Quantais.[110] Its primary problem, however, is the breadth of its scope. It intrinsically differentiates AI-generated from AI-assisted works but provides no explanation for its extension of the concept of AI-assisted to both possibilities. Although it is used in the context of a report, it must be noted that this is a definition that does not serve the purpose of this research. In addition, 'assistance' is a too vague concept:

[109] Hartmann et al, *supra* note 9 at 27.
[110] Hugenholtz & Quintais, "Copyright and Artificial Creation", *supra* note 9 at 1192.

from the perspective of copyright law, an assistant who paints for someone else can be either an author or an amanuensis.

The third approach is created by authors who reject this classification and is particularly well represented by the Max Planck Institute for Innovation and Competition (Institute)[111] and Grimmelmann.[112] These definitions assume the involvement of a human being in all AI output and thus disregard the distinction between AI-assisted and AI-generated works. Such approach assumes away the core of the problem. However, although full autonomy is not a current possibility, its existence as an AI aim was discussed.[113] Another reason the Institute's definition is not useful to copyright law is the confusing nature of its concept of "assisting tools":[114] as stated above, the concept of assistance in copyright law covers two distinct forms of regime.

This may a good time to bring Abbott's definition, under patent law, into discussion. Abbot describes the contribution of AI systems as follows:

> *Like a person, an AI's involvement in the inventive process could be conceptualized on a spectrum. At one end, AI is a tool assisting an inventor; on the other, it functionally automates conception.*[115]

In my opinion, placement of AI-assisted, and AI-generated, works on a spectrum can be misleading because a difference exists in the quality, not the quantity of the contribution. Although it is addressed through an analogy with a person, evaluation of a natural person's contribution in copyright law is not an assessment of place along a continuum: it is an assessment of the quality of the contribution itself. On one hand, an assistant may contribute too much and

[111] "As long as a human conceives the overall computational process and specifies instructions as to how it should be carried out, computers are tools assisting human inventors." Drexl et al, *supra* note 9 at 24.
[112] "The next-simplest answer to what counts as a computer-generated work is one that was created using a computer." Grimmelmann, *supra* note 9 at 406.
[113] See Chapter 2.3, above.
[114] *Supra* note 111.
[115] Abbott, *supra* note 9 at 78.

still have no right to claim authorship. On the other, there could be cases where a natural person with a minimal contribution is entitled to co-authorship. In addition, there is no continuity between these two situations, of the sort, for example where AI contribution increases as that of natural persons decreases. As long as contribution meets the threshold of protection, it need not be quantitatively equal to that of others.[116] In a similar vein, in assessing the contribution of several natural persons, it would not be correct to evaluate them across a spectrum because no transitional phase exists between assistant and coauthor. On the contrary, an AI system can interrupt the creative process, in a way similar to the unexpected movement of a third party or a monkey[117], or the effect of a natural event (this will be explored in following sections).[118]

Finally, some authors do not use the term 'AI-generated' directly and instead categorize the output, i.e., works created with the use of an AI system. Ginsburg and Budiardjo, for example, classify machines that fall outside of the realm of ordinary tools and instead contribute to, or result in, works considered to be "generative machines."[119] They, then further develop the definition by distinguishing between partially and fully generative machines.[120] In doing so, they make an artificial distinction as to whether or not the user makes a creative contribution.[121]

Ordinary tools, however, contrary to their arguments,[122] can embody the designer's preferences rather than those of the user. For instance, in the case of a video game, the possibilities open to the person playing the game are defined by the designer. Indeed, in *Midway*

[116] Paul Goldstein & P B Hugenholtz, *International copyright: principles, law, and practice*, fourth edition ed (New York, NY: Oxford University Press, 2019) at 233.
[117] See generally *Naruto v. Slater*, 888 F.3d 418, 426 (9th Cir. 2018).
[118] *Kelley v. Chicago Park District*, No. 08-3701 and 08-3712 (7th Cir. 2011).
[119] Ginsburg & Luke Ali Budiardjo, *supra* note 9 at 348.
[120] *Ibid* at 405.
[121] *Ibid*.
[122] "'Ordinary tools'- machines which rely solely on the creative contributions of their users, and for which the creative contributions of the machines' designers are minimal, nonexistent, or not apparent in the resulting work- form one end of the spectrum." See *ibid*.

Manufacturing Co. v. Arfic International, Inc.[123] which is mentioned by the authors,[124] the Seventh Circuit admits that each possible gameplay sequence was incipient in the game's design. For this reason, it can be misleading to describe the ordinary tool on the basis of the limited case where it reflects the user's preferences.

In addition, the user or designer of AI systems can be a single person or a large number of people, and it will not always be easy to differentiate between the two. A lot of uncertainty also exists in the shift point separating designer from user. For example, will an AI researcher who obtains the output and changes the parameters of the ML model for the next creation be considered its designer or user? Correspondingly, is this AI model a fully or partially generative machine? I will, therefore, not deal with the sub-system details of this distinction here: the component of creative contribution to works in this classification is compatible with the definition that this thesis will adopt.

Second, the distinction was made by Sentfleben and Buijtelaar on the basis of the room for free and creative human choice left to the human author.[125] Although not explicitly mentioned, the authors differentiate the situations where choice is restricted and unrestricted on the basis of the scope of the person's creative control. Limited and no creative control, however, are two quite different situations, and the protection is to be granted as long as some, if limited, creative control is exercised.

For all of the reasons articulated above, this thesis will employ the classification developed by Schönberger as follows: "(…) cases where such causality is missing due to the

[123] *Midway Manufacturing Co. v. Artic International, Inc.*, 704 F.2d 1009 (7th Cir. 1983)
[124] Ginsburg & Luke Ali Budiardjo, *supra* note 9 at 377.
[125] Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9 at 8.

degree of autonomy, as well as the emergent nature of robot contribution, and where machines cannot be seen as tools anymore."[126]

Thus, AI-generated works for purposes of this thesis will refer to those created by breaking the causal link with any human being in the creative process, as a consequence of the autonomy of the AI system. Indeed, the *Proposal for AI Liability Directive* introduced alleviations of the burden of proof in non-contractual liability regimes due to the challenges of establishing causality on the victim.[127] The establishment of a fictional link by the provision in the *UK Act* can also indicate an existing causality link, at some point, has been intervened in. Other works of art produced using AI but outside these parameters will be referred to as AI-assisted works.

In the examination of this interdisciplinary field, examples will thus be approached via the basic legal notion of causal link. The causal perspective will be used in the integration of these non-causal systems into the anthropocentric legal field in order to reinforce the fundamental distinction between AI systems and natural persons, and thus the concept of incommensurability. Ontological and epistemological differences between humans and computational agents also differ in decision mechanisms.[128] For instance, causation is a feature of explanations of the human mind;[129] AI systems are created and explained, not through causal models, but pattern recognition.[130] For this reason, it is unlikely to be said that a causal relationship exists between every decision taken by an AI model and the AI researcher. A causal link will be established

[126] Werra, *supra* note 9 c Deep Copyright: Up-and Downstream Questions Related to Artificial Intelligence (AI) and Machine Learning (ML) at 155.
[127] *Proposal for AI Liability Directive*, *supra* note 8 at 1.
[128] Fazi, "Beyond Human", *supra* note 64 at 66.
[129] Brent Daniel Mittelstadt et al, "The ethics of algorithms: Mapping the debate" (2016) 3:2 Big Data Soc 205395171667967 at 3.
[130] Chou et al, "Counterfactuals and Causability in Explainable Artificial Intelligence", *supra* note 86 at 4.

when the person using the system can interpret the decisions taken causally.[131] It is not correct, therefore, to directly compare or link the random decision of an AI model to that of a natural person. In principle, then, these systems are neither interpretable nor explainable. This difference is given special attention in the field of XAI and becomes particularly apparent in cases where the provisions created for natural persons are applied to non-human beings.

In terms of copyright law, it will be necessary to place the decisions made by AI systems into an anthropocentric framework. The AI system's decision-making may thus intervene in the causality between AI researcher and output. De Cock Buning explains this situation by indicating that "the AI systems' contribution might render creative human contribution redundant in the generative process."[132] Where no causal link exists between the natural person and AI system decisions, it needs to be established; where such a link exists, it will be necessary to ensure that it is not broken. In this way, a legal framework will be possible to create for these works. The limitation introduced by Schönberger is, thus, a clear and useful definition that will serve the purposes of this thesis. The following section will list a number of examples from real life to reify these parameters.

2.5 State-of-the-Art AI Systems

In 1951, in the infancy of computer system development, Alan Turing built a machine that could create three simple melodies.[133] At the time of this writing, nearly 70 years later, an AI

[131] *Probabilistic Reasoning in Intelligent Systems* (Elsevier, 1988)., cited in *ibid* at 4.
[132] de Cock Buning, *supra* note 9 at 511.
[133] Andrew R. Chow "Musicians Using AI to Create Otherwise Impossible New Songs | Time", (5 February 2020) online: *Time* <time.com/5774723/ai-music/> [perma.cc/R3A5-4SJS].

system called AI-DA painted an algorithmic portrait of the Queen Elizabeth II.[134] AI systems today are used not only in the fields of music and visual arts but also in literature, and many other artistic subfields.

This section will provide examples of currently available AI systems to concretize the definitions and concepts discussed so far. These examples will clarify both their current state and, within the framework of the definition adopted here, the ways in which causality can be broken between them and the natural persons. In addition, the level of contribution of an AI or human being will be investigated through several examples.

The extent to which natural persons are involved in a range of creation scenarios rather than simply identified as involved in the creative process, will then be discussed and appropriately labelled. In this way, this thesis will avoid establishing the 'natural person vs. AI' author dilemma, and will focus instead on who or what exerts, or is likely to exert, the intellectual effort, as the copyright system requires.

The current state of AI in the music industry, reached from Turing's compositions is exemplified by AIVA (Artificial Intelligence Virtual Artist).[135] AIVA uses deep learning algorithms trained on a database of 30,000 scores and has been recognized as a composer by the Society of Authors, Composers, and Publishers of Music (SACEM) in France.[136] These deep learning algorithms are based on stochastic algorithms, programmed with reinforcement learning techniques. Stochasticity is an essential element adding randomness to system decision. Some generative models actually use random noise as an input and transform it to a meaningful

[134] "Platinum Jubilee: AI robot paints Queen's portrait - BBC News", (27 May 2022), online: *BBC News* <www.bbc.com/news/uk-england-oxfordshire-61600523> [perma.cc/KA35-V6RA].
[135] "AIVA - The AI composing emotional soundtrack music", online: *AIVA* <www.aiva.ai/> [perma.cc/34DU-BQUG].
[136] "Aiva, l'incroyable IA qui compose des musiques", online: *Paperjam* <paperjam.lu/article/news-aiva-lincroyable-ia-qui-compose-des-musiques> [perma.cc/S5RG-HZ8G].

output.[137] By adding randomness in code, AI systems can exceed their original programming.[138] Stochasticity significantly reduces the predictability for the AI researcher of the decisions made, but it can also break the causality between those made by the individual and by the AI system. Examples of the various ways in which randomness can be included in the creation of a work of generative art, including AI systems, will be addressed in more detail below.[139]

The first example is the production of AIVA. When an algorithm is appropriately trained, as is AIVA, it can create infinite original music, with almost no likelihood of regenerating precisely the same composition. When it is not well trained, however, the possibility exists of producing infringing work:[140] two users could even produce the same output.

The second example is the most well-known of the visual arts: The Next Rembrandt.[141] A software system called Next Rembrandt, which was trained with approximately 300 portraits of Rembrandt, created a painting in the famous painter's style. This was done in an attempt to answer the question: what kind of painting would Rembrandt have created had he lived? Would the famous painter indeed have drawn such a painting? The developer of Next Rembrandt, Ben Haanstra, defines the work of art as follows: "When you want to make a new painting you have some idea of how it's going to look. But in our case we started from basically nothing — we had to create a whole painting using just data from Rembrandt's paintings."[142]

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[137] "The Generator | Generative Adversarial Networks", online: *Google Developers* <developers.google.com/machine-learning/gan/generator> [perma.cc/8225-4KXJ]; Ramalho, *supra* note 9 at 13.
[138] Margaret A Boden, 'Computer Models of Creativity' (2009) 30 AI Magazine 24 at 29, cited in Gaon, *supra* note 9 at 239.
[139] See Chapter 2.6, below.
[140] A problem defined as overfitting in computer science means the AI system remembers the dataset rather than generalizing due to higher training on this dataset. In this case, the AI system trained with copyrighted work will produce the same work and cause copyright infringement. See Foster & O'Reilly for Higher Education, *supra* note 68 c Deep Learning.
[141] "The Next Rembrandt", online: *The Next Rembrandt* <www.nextrembrandt.com> [perma.cc/J974-FCUZ].
[142] *Ibid*.

Contrary to Haanstra's belief, the choices made throughout the creative process cannot be ignored and will now be analysed. In general, five activities are involved when AI models are used to produce a work of art: "(1) technical research, (2) selection or building of models, (3) building of datasets, (4) training of models, and (5) curation of outputs."[143] In the case of Next Rembrandt, the choice of Rembrandt as the artist, the focus on his portraits, the choice of algorithm, the creation of a dataset based on this data, and the selection of one of the output were creative contributions.[144] The question arises, however, whether these choices can be those which justify the causal link providing the person with rights and liabilities.

Database design, for instance, is virtually a projection of the programmer's world views,[145] and the dataset can be existing, curated, or custom-made.[146] The curated dataset for Next Rembrandt is 346 portraits of Rembrandt. Second, algorithms can be written from scratch, or procured or modified from those that are existing and open source.[147] Since this example is of a portrait, a facial recognition algorithm identified the patterns used by Rembrandt as he drew his portraits.[148]

An example of the use of more general preferences is AICAN's The Birth of Venus. The Birth of Venus was produced by a creative adversarial network called AICAN, fed with 80,000 images representing the Western art canon.[149] ML models work better with large amounts of data, but an artist's artistic purposes may not match the model's requirements to work well.[150] The dataset scale is thus also a choice. As a result of this training, AICAN favors creation of more

[143] Isis Hjorth & Anne Plain, *supra* note 57 at 21.
[144] *Supra* note 141.
[145] Ruha Benjamin, *Race after technology: abolitionist tools for the new Jim code* (Medford, MA: Polity, 2019) at 79.
[146] Isis Hjorth & Anne Plain, *supra* note 57 at 23.
[147] *Ibid* at 22.
[148] Cláudio Lisboa dos Santos & Ângela Rocha Machado, "Intellectual Property on Works of Art Made by Artificial Intelligence" (2020) 7:12 Int J Adv Eng Res Sci 49–59 at 56.
[149] Elgammal, *supra* note 18.
[150] Isis Hjorth & Anne Plain, *supra* note 57 at 24.

abstract over figurative works, not because specific images were selected to train it but because this is how it understands the evolution of art history.[151] Art history students can certainly use their study of paintings throughout their years of education to produce their own versions of The Birth of Venus; but when an AI does this, a sci-fi feeling is evoked.[152] The question that arises at this point is, however: By granting copyright protection to this work and thereby commercial force, have the aims of copyright laws been complied with?

In a similar vein, 53 million images were created by Artbreeder over two years.[153] Generative models are based on probabilistic theory[154]: a space is created within the presented dataset, in other words, and the model is trained within this space. It can consist of Rembrandt paintings, Oscar Wilde texts, or Chopin Nocturnes. On the basis of its training, deep learning AI systems create a latent space: that is, "the statistical topography of the aggregated features of the training data, mapped onto a high-dimensional mathematical space" — which offers an additional set of choices for artistic outputs.[155] This latent space can be considered the AI model's way of perceiving the dataset. However, the properties of data that the AI model learns are sometimes indecipherable to a human being: the inexplicability of these intelligent systems thus keeps the process feeling mysterious.[156]

In the last step of the process, the model can generate all of the results that fall within the scope of the space consisting of the dataset presented to it. The output is thus not a single image

[151] Elgammal, *supra* note 18.
[152] Isis Hjorth & Anne Plain, *supra* note 57 at 61.
[153] Jason Bailey, "The Tools of Generative Art, from Flash to Neural Networks", (8 January 2020), online: *ARTnews.com* <www.artnews.com/art-in-america/features/generative-art-tools-flash-processing-neural-networks-1202674657/> [perma.cc/HZY5-CDAS]. See also "Artbreeder", online: *Artbreeder* <artbreeder.com> [perma.cc/JBU3-M35D].
[154] Franceschelli & Musolesi, *supra* note 9 at 2.
[155] Isis Hjorth & Anne Plain, *supra* note 57 at 23.
[156] *Ibid* at 51.

but a class of images:[157] all of the possibilities of the trained concept. On the one hand, the creation of 53 million images by just one model increases monopolies in a system where protection is exceptional, putting the limits of protection into question. On the other hand, among models with such intense output, curation by AI researchers can also seem like a creative contribution.

The last example giving rise to questions about creative choices is DALL-E, an updated version of which was shared in April of 2022.[158] DALL-E, a text-to-image model of OpenAI, can generate multiple images with a single prompt. A feature that differentiates this AI model from the others mentioned above is its ability to bring together the concepts of language and images and to achieve results with a single click of a button or an enter on a command line. It is, therefore, also an example of just how close the scenario is where an AI system generates all of the possible expressions inherent in an idea.[159]

Having reached the current possibilities of autonomy in machine-learning models, I'll now discuss examples of works in which the "authorial causation"[160] is not broken, that is, models that are considered in this thesis to be 'AI-assisted.'

An example is the set of Style Transfer algorithms. These models can, firstly, receive their expected inputs from other AI systems. A work can be termed 'AI-assisted' when neural style transfer algorithms are used to train an AI model to reproduce a work in a specific style. Neural networks, for example, were trained on the photographs of Rembrandt's famous "The Night

[157] *Ibid* at 39.
[158] Metz, *supra* note 2.
[159] See e.g. an AI for generating fake pokemon. Since the "pokeman space" is limited, i.e., numbers of pokemons are finite, this AI system can produce all possibilities based on a training dataset consisting of all Pokemons. "Generate Fakemon using AI", online: *Nokemon* <nokemon.eloie.tech/> [perma.cc/Y7AA-9T2U].
[160] See Balganesh argues for the existence of an unstated yet distinct theory of authorial causation in Shyamkrishna Balganesh, "Causing Copyright" (2017) 117:1 Columbia Law Rev 1–78.

Watch" in the restoration of the original painting.[161] Some authors refer to this as "mimicry, or the death, rather than the making, of art"[162], because these creations can be equated to application of an 'effect' to a visual image. In addition, AI artists admit that modifying the texture of an existing image is a more controlled process than other 'computational creativity' activities.[163]

Second, this section will address the recipes developed by IBM's Watson.[164] In theory, recipes are not subject to copyright protection under EU law unless they are originally expressed.[165] While recipes created by Watson cannot be subject to copyright protection, their compilation into a book through curation, and addition of a literary style, or set of images, can be. The book, in this case, can be referred to as an AI-assisted work. If a natural person replicated Watson's actions, in other words, by creating recipes using randomly selecting ingredients, this selection alone would not provide a basis for copyright protection.

Finally, networks used for language translation tasks can also be considered to be AI-assisted. These systems are fed with a text in the source language and deliver a translated text. The encoder-decoder networks can be used for this task.[166] The output text can be referred to as an AI-assisted work because the ability of a natural person is relatively high, and the causal link is thus relatively solid.

This section concretized the distinction between AI-assisted and AI-generated works. The following section will compare the AI-generated ones with other generative artworks, further detailing 'causality' in creative processes.

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[161] Daniel Boffey, "AI helps return Rembrandt's The Night Watch to original size", (23 June 2021), online: *The Guardian* <www.theguardian.com/artanddesign/2021/jun/23/ai-helps-return-rembrandts-the-night-watch-to-original-size> [perma.cc/EN3A-FWDD].
[162] Isis Hjorth & Anne Plain, *supra* note 57 at 62.
[163] *Ibid* at 25.
[164] Watson, Cognitive cooking with Chef Watson: recipes for innovation from IBM & the Institute of Culinary Education (Naperville, Illinois: Sourcebooks, Inc, 2015); cited in Abbott, *supra* note 9 at 76.
[165] *Levola Hengelo BV v Smilde Foods BV*, C-310/17, [2018] ECR *[Levola Hengelo]* Opinion of Advocate General §55.
[166] Foster & O'Reilly for Higher Education, *supra* note 68 c Teaching Machines to Paint, Write, Compose, And Play.

2.6 Generative AI Art

This section will refer to generative art, a higher-level category of computer-generated art,[167]to create an analogy between AI-generated works and other artworks involving randomness, and to cite other examples where the causal link between author and output is hard to establish. In this process, it will demonstrate the nature of that causality link.

Boden defines computer-generated art as "the artwork [that] results from some computer program being left to run by itself, with minimal or zero interference from a human being."[168] She defines generative art as "the artwork [that] is generated, at least in part, by some process that is not under the artist's direct control" and includes all examples where the artist loses that direct control.[169] Primary examples of these situations are those where musical notes are determined by the roll of a dice,[170] a camera is supplied to a monkey,[171] drip painting[172] and cultivation of a garden.[173] From the perspective of copyright law, however, it would not be correct in these cases to say the author of work is always the artist who loses control. Control in each of these examples takes place at a different level, which raises the question from a legal perspective, whether the determining characteristics of the scenario can intervene in the causal link.

[167] Margaret A Boden & Ernest A Edmonds, "What is generative art?" (2009) 20:1–2 Digit Creat 21–46 at 29.
[168] *Ibid* at 32.
[169] *Ibid* at 29.
[170] See Grimmelmann, *supra* note 9 at 412.
[171] See Ginsburg & Luke Ali Budiardjo, *supra* note 9 at 362. See also *supra* note 117.
[172] Dan L Burk, "Thirty-Six Views of Copyright Authorship, by Jackson Pollock" (2020) 58:2 Houst Law Rev 263–326.
[173] See *supra* note 118.

The first example of the dice is, *Musikalisches Würfelspiel*, German for 'musical dice game'.[174] Here, notes are associated with the numbers on dice, and pieces are composed through the randomness of their throws.[175] A completely original composition can be created with these numbers; despite the randomness of the creative process, however, the composer can still make a preference for the notes to be played by rolling the dice one more time. She can also break the rules of the game by selecting another note when she does not like that associated with the number given by the dice. In fact, it cannot even be said that a piece has been created unless the notes are expressed, that is to say, fixed, again, in such a way as to be subject to copyright. The will at the moment the note is chosen is the moment of creative choice protected by copyright law.

Another example is each of the paintings of Jackson Pollock, which he created with random splashes of his brush. Ginsburg and Budiardjo have argued that Pollock lost control because he gave that over to gravity, which was out of his control.[176] Although the artist does not calculate the force gravity in the painting process, it is calculable by human beings, as is the applied kinetic force of each splash. The artist still knows or supposes the fundamental rules of physics. Even between brushstrokes, he can apply more or less force, and thus alter the work. In fact, every painting is created by the application of force against gravity, and gravity is not normally calculated for any of them, but the result is somehow predictable.

In AI-produced works, on the other hand, an AI researcher's change to a parameter or training set will not change the artwork under production; it will, rather, alter the output that will follow it. In addition, the consequences of the change will not be predictable with absolute

[174] D Cope, "Recombinant music: using the computer to explore musical style" (1991) 24:7 Computer 22–28, cited in Bridy, *supra* note 9 at 12.
[175] Margaret A Boden, "Computer Models of Creativity" (2009) 30:3 AI Mag 23 at 32.
[176] Ginsburg & Luke Ali Budiardjo, *supra* note 9 at 361.

certainty. The researcher with an AI model, therefore, does not have as much control as the artist with a brush.

Another controversial situation lies in the various scenarios related to the example where a camera is given to a monkey. These might include adjusting the camera's settings before making the monkey take a photo to the monkey finding a camera by chance and taking a photo: a separate authorship analysis would need to be conducted for each photo.[177] Ownership of the camera alone would not convey authorship, whereas adjustment of the camera could be seen as in an act justifying the authorship of the work.[178] This example illustrates just how nuanced the causality analysis can be.

Finally, the *Kelley v. Chicago Park District*[179] case will be mentioned in this context. Although this case involves a legal analysis of a different jurisdiction, meaningful factual inferences regarding causality have been made, as in the other examples in this section. In this case, authorship is not ascribed to a person who cultivates a garden since this person has no control over output because of natural forces.[180] Forms and appearances of garden rely mainly on natural forces.[181] In legal systems, in parallel, another person's acts[182] or natural events[183] are generally accepted as interventions in a causal link.[184]

With these examples, the causality link called authorial causation in creative relations has been outlined. Thus, this section provides a solid framework for legal analysis in the next chapter.

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[177] *Ibid* at 362.
[178] *Ibid*.
[179] *Supra* note 118.
[180] Balganesh, *supra* note 160 at 31.
[181] *Kelley v. Chicago Park District*, 635 F.3d 290 (7th Cir. 2011) at 304, cited in Ginsburg & Luke Ali Budiardjo, *supra* note 9 at 364.
[182] Burk, *supra* note 172 at 295.
[183] *Ibid* at 307.
[184] See Eric A. Johnson, "Two Kinds of Coincidence: Why Courts Distinguish Dependent from Independent Intervening Causes", (2017) 25:77 Geo. Mason L. Rev. 83-84 at 83 n.44, cited in *ibid* at 299.

2.7 Conclusion

This chapter has presented a general overview of AI technologies to further an understanding of their role in the creative process. Having established workable definitions and a basic understanding of these technologies before posing legal questions will facilitate readers' progress in future chapters. The technical basis laid out in this chapter will thus enable the research questions asked in the following chapters to be given more concrete form and answered more quickly.

The first section developed a definition of 'Artificial Intelligence'. For purposes of this thesis, it will mean 'the techniques and approaches that aim to reproduce the cognitive abilities of a human being and that are listed in Annex I of the EU *Proposal for AI Act*'.

The second section explained the machine learning models at the center of this thesis's focus. It addressed their subcategories and emphasized their autonomous and unexplainable character. These characteristics are essential to the legal assessments that will be made in subsequent chapters.

The third section used the analysis of many in the field to differentiate between AI-assisted and AI-generated works. For purposes of this thesis, AI-generated works refer to those created by breaking the causal link with any human being in the creative process, as a consequence of the autonomy of the AI system. Conversely, AI-assisted works refer to other works created with the use of an AI system.

The fourth section concretized the technical components of the thesis by describing several contemporaneous and often sensational AI models, and the works created by them. This chapter has thus demonstrated the ways in which many areas of daily life make common usage of these systems and how relevant the research questions posed here are to people across the globe.

Further, the examples and the issues raised have the potential to shift the paradigms of EU copyright law; this will be developed in the following chapter.

The final section provided examples of generative artworks, illustrating the ways in which the causal link between author and output can be interrupted, in line with the definition of AI-generated works adopted here.

To summarize, this chapter has created a common and consistent ground of understanding with a shared language for readers in range of fields.[185] Indeed, many authors have highlighted the importance of reframing and understanding disruptive technologies such as AI systems, for legal evaluation.[186] This thesis will also help the reader to better understand the ways in which these models should be integrated within, and the ways they will challenge, existing legal systems.[187]

[185] Gaon, *supra* note 9 at 42.
[186] *Ibid* c Reframing the artificial intelligence concept; Abbott, *supra* note 9 c Understanding Artificial Intelligence.
[187] Abbott, *supra* note 9 at 32.

3 Copyright and Neighbouring Right Protection under the European Union Law

3.1 Introduction

This chapter will describe the legal framework of European Union copyright law. For purposes of this thesis, this chapter will not address the whole of EU copyright law, simply those aspects that could pose problems or be exemplary to provision of the protection for the works defined in Chapter Two. It will then proceed to lay the groundwork for understanding of (a) the tension between the current EU copyright law and the AI-generated works; (b) the various options proposed to resolve this tension; and (c) the option that I recommend in the following chapter.

Before proceeding, however, a rationale needs to be given for the choice of EU law as the jurisdiction on which to focus. First, the European Parliament and Council have recently published two Proposals: one to regulate Artificial Intelligence technologies[188] and the other for a Directive on adapting non-contractual civil liability rules to AI.[189] These Proposals are the EU's first attempt to regulate AI and set forth the fundamental concepts with respect to AI technologies. Although they do not deal with copyright law and the research question posed here, they have given rise to a great deal of research, including studies on the encounter between AI technologies and copyright law.[190] The EU legislator has also framed the purpose of the Union's copyright and neighbouring rights system in the *Directive 2019/790 of 17 April 2019 on copyright and*

[188] *Proposal for Artificial Intelligence Act*, *supra* note 8.
[189] *Proposal for AI Liability Directive*, *supra* note 8.
[190] *Supra* note 9.

neighbouring rights in the Digital Single Market[191] (*CDSM Directive*). It will be "taking technological developments into account while respecting fundamental rights in the internal market".[192]

Second, the progress of AI technologies represents advances of global importance.[193] It has also been the subject of many international institutional agendas, including that of the Organization for Economic Co-operation and Development (OECD)[194] and WIPO.[195] Discussion of these technologies must therefore be conducted on as broad a scale as possible. The EU is a supranational jurisdiction, which currently includes 27 national jurisdictions.[196] Given its size, diversity and inclusivity, examination of the EU's approach to AI regulation may speed development of a comprehensive solution to the globally developing technology.

Third, EU copyright legislations must be sufficiently flexible to be implemented in all Member States' legal systems. For this reason, EU law illustrates a tendency to enact Directives[197] that provide a degree of freedom to its Member States' own copyright law commensurate with the flexible character of the field of law. Directives as legal texts in this field represent conscious choices that reflect this aim and are compatible with the dynamic character of copyright law. This thesis aims to reconcile the inclusive and flexible structure of EU law with the global and ever-evolving characteristics of AI technologies.

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[191] EC, *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.)*, [2019] OJ, L 130/92.
[192] *Ibid* recitals 83-84.
[193] Daniel Zhang et al, "The AI Index 2021 Annual Report" (2021), online: <arxiv.org/abs/2103.06312>, chapter 3; cited in Littman M. L.et al.., *supra* note 59 at 39.
[194] OECD, *Artificial Intelligence in Society* (OECD, 2019).
[195] World Intellectual Property Organization, *WIPO Technology Trends 2019: Artificial Intelligence.* (Geneva: World Intellectual Property Organization, 2019).
[196] The European Union currently consists of 27 Member States *supra* note 13.
[197] The EU copyright law consists of 11 directives and 2 regulations, harmonizing the essential rights of authors, performers, producers and broadcasters. See "The EU copyright legislation | Shaping Europe's digital future", online: *European Commission* <digital-strategy.ec.europa.eu/en/policies/copyright-legislation> [perma.cc/2JW4-49WR].

This chapter will begin by summarizing the principal theories justifying EU copyright law, and the ways in which they also serve as a justification for the protection of AI-generated or AI-assisted works. It will then lay out the concepts related to the author, the primary actor of copyright law, and authorship in general. Building on these, next, will be a discussion of the idea-expression dichotomy, a distinction at the core of European copyright law. Originality, the main condition of protection under copyright law, will then be addressed by referencing the Directives and Court of Justice of the European Union (CJEU or Court) case law, since every AI output, regardless of its nature as 'generated' or 'assisted', must meet Union law requirements.

In addition, this chapter will address the various types of neighbouring rights and the EU's approach to them. This range of protection models covers a number of neighbouring rights including those that first emerged under the *Berne Convention for the protection of Literary and Artistic Works 1886*[198] (*Berne Convention*) and the rights of press publishers, which were recently adopted within the scope of the *CDSM Directive*.[199] Finally, although the recent Proposals have no provision for copyright law, the principles they set forth can apply to all subfields of EU law and will therefore be outlined. These models and principles will be used to draw conclusions for the protection of AI-generated and AI-assisted works.

3.2 Fundamental Theories Underlying European Copyright Law

This section will outline the *ratio legis* of copyright and neighbouring rights protection in EU law. Scholarship rationalizing copyright law is prodigious and a variety of theories have been

[198] *Berne Convention for the Protection of Literary and Artistic Works*, 9 September 1886, 828 U.N.T.S. 221 (entered into force 29 January 1970) [Berne Convention].
[199] *Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and neighbouring rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC (Text with EEA relevance.)*, *supra* note 191.

put forward to underpin their protection.[200] In terms of European Union copyright law, these theories have been applied to each jurisdiction as well as to the *sui generis* structure of the EU. Several authors have created compilations,[201] but this thesis will address only those theories which seem most convincing from both explanatory and normative perspectives. These provide the underpinning for "connection of substantive copyright rules *inter se* into a unified and analytically coherent whole system."[202]

A better understanding of these theories will allow the reader to determine whether they can support and justify the protection of AI-generated works under EU copyright law and, if possible, the form that this protection should take and extent to which it should be given. In addition, it will ensure the compatibility and accurate positioning of the protection granted in relation to the other elements of the legal system.

These theories also shed light on the teleological, systemic, and purposive interpretation of AI for legislative purposes by the European courts.[203] Finally, their detailed analysis will give the reader an understanding of the intrinsic relationship between copyright protection and the fundamental rights and freedoms stipulated in Article 1 of Protocol 1 of the *European Convention on Human Rights* (ECHR)[204] and Article 17(2) *Charter of Fundamental Rights of the European Union* (CFR).[205]

This section will address natural rights, utilitarian, and pluralist theories, respectively.

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[200] Pila & Torremans, *supra* note 15 at 67; Ramalho, *supra* note 9 at 20; Gaon, *supra* note 9; Rochelle C Dreyfuss & Justine Pila, *The Oxford Handbook of Intellectual Property Law*. (Oxford: Oxford University Press, 2018) c The Basic Structure of Intellectual Property Law at 5; Stephen R Munzer, ed, *New essays in the legal and political theory of property*, Cambridge studies in philosophy and law (Cambridge, UK ; New York: Cambridge University Press, 2001) c Theories of intellectual property by William Fisher.
[201] Pila & Torremans, *supra* note 15.
[202] *Ibid*.
[203] *Ibid*.
[204] *European Convention for the Protection of Human Rights and Fundamental Freedoms*, 4 November 1950, 213 U.N.T.S. 221 (entered into force 3 September 1953) [ECHR] Protocol 1art 1.
[205] EC, *Charter of Fundamental Rights of the European Union*, [2012] OJ, C 326/391 [CFR] art 17(2).

3.2.1 The Natural Rights Theory

According to legal interpreters of this theory, copyright is a natural right that exists without being created by law.[206] The foundations of this argument are found in Hegel and Locke's property doctrines, namely the personality theory, and the labour theory, respectively.[207]

In his Philosophy of Right, Hegel argues that each creation is an "external manifestation" of the creator's personality.[208] The creative process is, thus, a form of individual self-expression. In copyright law, the most prominent application of this theory is the interpretation of moral rights seen as personality rights,[209] subject to the author's interpretation. Pila explains this correlation: "property is a right of personhood and personality, with copyright being the paradigm."[210]

According to Locke's theory of labour, as the creation of intellectual products requires special effort, it should be compensated.[211] In its largest sense, the property right provided within the scope of copyright protection is recognized as the product of such labour; protection can, therefore, also be seen as a reward for intellectual effort.[212] Recital 10 of the *Directive on the harmonization of certain aspects of copyright and neighbouring rights in the information society* (*InfoSoc Directive*) explicitly reflects this theory:

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[206] Ramalho, *supra* note 9 at 21.
[207] *Ibid*.
[208] Georg Wilhelm Friedrich Hegel, "Philosophy of Right" in Sir Thomas Malcolm Knox, ed, *Hegels Philos Right* (Oxford University Press, 1821) 1 at 55; Pila & Torremans, *supra* note 15 at 79.
[209] Eechoud & Hugenholtz, *supra* note 94 at 68.
[210] Eleonora Rosati, ed, *The Routledge handbook of EU copyright law*, Routledge handbooks (London New York: Routledge, Taylor & Francis Group, 2021) c The authorial works protectable by copyright by Justine Pila at 78.
[211] Munzer, *supra* note 200 at 2.
[212] Ramalho, *supra* note 9 at 22.

> *If authors or performers are to continue their creative and artistic work, they have to receive an appropriate reward for the use of their work, as must producers in order to be able to finance this work.* [213]

Although normative priority, within the scope of Locke's theory of labour, is placed upon the individual autonomy of the creator, scholars also acknowledge that another of its fundamental purposes is enhancement of social welfare.[214]

Finally, benefits accrue from connection of this theory to a human rights interpretation of property. As an intellectual property right, copyright is one of the fundamental rights, i.e., that to property. As outlined in Article 27(2) of the United Nations *Universal Declaration of Human Rights*: "Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author."[215] This intrinsic relation is another basis for the natural rights argument. In Recital 70 of the *CDSM Directive*, the EU legislator emphasized the fundamental right aspect of IP rights and that they should be weighed against other fundamental rights, in particular, the freedom of expression and the arts.[216]

In sum, it can be argued that copyright protection is not suitable for AI-generated works since it is a human right regime in the first place.[217] However, many individuals and their efforts, each of which can be subject to personality and labour theories, are behind the AI system and its output. In addition, AI-generated works, which are also models of self-expression, enhance social welfare. However, the next subsection will address the utilitarian theory in order to facilitate the discussion in the following chapters.

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[213] EC, *Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society*, [2001] OJ, L 167/10 recital 10; Pila & Torremans, *supra* note 15 at 80.
[214] Pila & Torremans, *supra* note 15 at 81.
[215] *Universal Declaration of Human Rights*, 10 December 1948, 217 A (III) art 27(2).
[216] *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.)*, *supra* note 191 recital 70. See also *Productores de Música de España (Promusicae) v Telefónica de España SAU*, C-275/06, [2008] ECR I-00271.
[217] Hugenholtz & Quintais, "Copyright and Artificial Creation", *supra* note 9 at 1195.

3.2.2 The Utilitarian Theory

Another theory underlying European Union copyright law is that, through the protection provided to the intellectual product, the creators are encouraged, and the works, disseminated, for the benefit of society.[218] Further, the protection provided by the state prevents abuse of the creator's monopoly and ensures public access to created works. In this way, it also limits the increase in abusable monopoly that natural law-based theories can make way for. The utilitarian perspective offered by this theory also ensures the principle of proportionality[219] and thus, copyright law promotes social welfare.

In addition, as mentioned above, a particular investment and effort are required to create works, whereas copying and disseminating are easy. Protection in EU law provides authors with the opportunity to supervise and financially regulate the investment and creative action in their works, and thus closes the value gap. On the other hand, utilitarianism has been criticized for its focus on incentivization. Authors of the works do not always need incentives;[220] indeed, some creators are incentivized by the activity of creation itself.[221]

Given the increase in the creation and dissemination of artistic and literary works through AI systems, this theory provides sufficient justification to protect AI-generated ones. Although

[218] Pila & Torremans, *supra* note 15 at 85.
[219] (As indicated in EU Directives, in accordance with the principle of proportionality, "these legal texts do not go beyond what is necessary in order to achieve their objectives." The utilitarian perspective provides such an objective) See e.g. EC, *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 recital 21, *Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and neighbouring rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC (Text with EEA relevance)*, *supra* note 191 recital 83.
[220] Christopher Jon Sprigman, "Copyright and Creative Incentives: What Do(n't) We Know?" in Rochelle Cooper Dreyfuss & Elizabeth Siew-Kuan Ng, eds, *Framing Intellectual Property Law in the 21st Century*, 1st ed (Cambridge University Press, 2018) 32 at 49, cited in Ramalho, *supra* note 9 at 21.
[221] *Ibid*.

several authors reject protection, arguing that AI systems do not need incentives *per se*,[222] this theory would apply to each individual behind the system. Criticisms of applications of both theories to copyright law have been resolved by recourse to a third or pluralist theory, which combines the previous two. Following this, the next subsection will outline pluralist theory.

3.2.3 The Pluralist Theory

According to Resnik, a single theory could not account adequately for copyright law, and each theory emphasizes a different value or goal.[223] In this regard, the pluralist theory aims to compensate for the missing elements, or drawbacks, of natural rights theory and utilitarianism in isolation by referencing different IP regimes and the pluralistic nature of the European community.[224] In parallel, Merges also offered a pluralistic account of IP and employed each theory to balance copyright law between individual and societal interests.[225]

Even though different courts understand differently the purpose of copyright law in different jurisdictions, European courts invoke copyright's historical and theoretical accounts due to European harmonization.[226] This theory is particularly important in this context as it supports pluralism and inclusiveness of EU law. This feature matters for the EU, which brings together jurisdictions with a broad legal and social diversity. Its harmonization agenda, one of the EU's primary goals, is also pluralistic: it aims for convergence and uniformization of differences in the copyright law traditions of its Member States. This is a harmonization, it should be noted, that

[222] Werra, *supra* note 9 at 158; Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9 at 14.
[223] D B Resnik, "A Pluralistic Account of Intellectual Property" (2003) 46:4 Journal of Business Ethics 319–335 at 319, cited in Pila, *supra* note 91 at 187.
[224] *Ibid*.
[225] Robert P Merges, *Justifying intellectual property* (Cambridge, Mass: Harvard University Press, 2011), cited in *ibid* at 186.
[226] *Ibid* at 190.

does not intend for each jurisdiction to shed its own, particular, characteristics. The Union's aim is to support a legal pluralism that also ensures coexistence of the different perspectives of its component nations.[227]

This theory embraces the previous theories and provides a groundwork compatible with the structure of the European Union. However, a more detailed assessment will be made when discussing whether AI-generated works should be protected under *acquis communautaire*.

3.3 Understanding Authorship

The author is the character that connects all of the components of the copyright system and is, thus, central to it. I will focus here on this protagonist,[228] illuminating her surrounding connections in copyright law and the ways in which AI-generated works can disrupt the system. For this reason, I will address her rights and features rather than her identity or particular form of creation.[229]

There is no established definition of 'author' in EU copyright law or the *Berne Convention*.[230] However, the *Directive on the legal protection of computer programs* (*Computer Programs Directive*) identifies the author as "the natural person or group of natural persons who has created the computer program or, the legal person designated as the rights holder by the Member States' legislation".[231] In addition, the *Directive on the legal protection of databases*

[227] Pila & Torremans, *supra* note 15 at 68.
[228] Craig & Kerr, *supra* note 9 at 8.
[229] For the discussion of "What is an Author?" See Michel Foucault & James D Faubion, *Aesthetics, method, and epistemology*, Book, Whole (New York: New Press, 1998).
[230] See generally *Berne Convention for the Protection of Literary and Artistic Works*, 9 September 1886, 828 U.N.T.S. 221 (entered into force 29 January 1970) [Berne Convention].
[231] EC, *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) (Text with EEA relevance)*, [2009] OJ, L 111/16 art 2(1).

(*Databases Directive*) echoes the same principle.[232] Union law appears to have established harmonized rules only for novel or relatively controversial categories of works.[233] Despite the lack of definition in the text, scholars have argued that the *Berne Convention* is based on the concept of 'human author', as understood in the related philosophical, semantic, and systematic arguments, and aims to protect that author rather than her work.[234]

Although the general rule is *human* authorship, some Member States' jurisdictions also accept the authorship of works by legal persons.[235] This shift is explicitly addressed in the *Directive on the term of protection of copyright and certain neighbouring rights* (*Term Directive*) and the *Computer Programs Directive* of Union law. *Term Directive* Article 1(4) stipulates that in the case where the Member States designate legal persons as rights holders, the protection period will be calculated in the same manner as that of anonymous and pseudonymous works.[236] According to Article 2(1) of the *Computer Programs Directive*, legal persons can be designated rights holders if Member States' jurisdictions permit.[237]

The central position of the author in Union law can be seen clearly in the components of the system. From their *droit d' auteu*r tradition, systems of civil law,[238] particularly, favor the author's intimate relationship with her work.[239]

The duration of copyright protection in the *Berne Convention* and the *Term Directive* has been calculated on the basis of the life of the natural person, due to her privileged position in the

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[232] EC, *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 art 4(1).
[233] Eechoud & Hugenholtz, *supra* note 94 at 302.
[234] Adolf Dietz, "The Concept of Author under the Berne Convention" (1993) 155:01 Rev Int Droit Auteur 56 at 12—16.
[235] Jane C Ginsburg, "The Concept of Authorship in Comparative Copyright Law" (2003) SSRN Electron J, online: <www.ssrn.com/abstract=368481> at 1069.
[236] *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 neighbouring rights (codified version)*, *supra* note 219 art 1(4).
[237] *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) (Text with EEA relevance)*, *supra* note 231 art 2(1).
[238] After Brexit, Ireland and Cyprus are the only common law jurisdictions in the EU.
[239] Goldstein & Hugenholtz, *supra* note 116 at 252.

system. As per *Term Directive* Article 1, copyright protection continues throughout the author's life plus 70 years *post mortem auctoris*.[240] The EU legislator has, in other words, limited copyright protection to the author and the lifetime of her descendants' first two generations.[241] The EU legislator has also extended this period from 50 to 70 years due to the fact that the average lifespan in the Community has increased.[242]

The link between legal status and one's life illustrates the central place taken by anthropocentric concepts in copyright law from the very beginning. However, a number of exceptions have been made. Joint authorship is the first instance where the idea of a single creator was abandoned. It is also the first example of abandonment of the idea of romantic authorship.[243] Further, because joint authorship requires the consent of all co-authors in all acts limited by copyright protection,[244] each co-author's control over her work is limited by other co-authors. The Union law is generally silent on collective works[245] but the *Term Directive* includes specific terms for protection of these works.[246]

Since the question of joint authorship is factual, it falls under the jurisdiction of the national courts.[247] While the French Court of Cassation defines this concept as "a concerted and conducted creative effort jointly by several authors",[248] the German *Act on Copyright and Related Rights* (UrhG) defines it as a case "where several persons have created a work without it

[240] *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 neighbouring rights (codified version)*, *supra* note 219 art 1.
[241] *Ibid* recital 6.
[242] *Ibid*.
[243] Ramalho, *supra* note 9 at 20.
[244] Eechoud & Hugenholtz, *supra* note 94 at 50.
[245] *Ibid* at 65.
[246] *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)*, *supra* note 219 art 1(4).
[247] *Term Directive* recital 13, cited in Eechoud & Hugenholtz, *supra* note 94 at 50.
[248] Cass civ 1e, 18 October 1994, [1994] Bull. civ 1994 I 217, No 92-17770.

being possible to exploit their shares in the work separately."[249]Here the contributions can be made simultaneously or consecutively.[250]

Anonymous and orphan works are two further exceptions to the general principle. The protection of such works, where the author's identity is unknown, shows the limits to which copyright law can be stretched in certain situations. For instance, while they are not defined by Union law,[251] the *Berne Convention*, makes anonymous works are subject to protection.[252] The term of protection in this case is "70 years after the work is lawfully made available to the public" under *Term Directive* Article 1(3).[253]

A similar framework of protection is in place for orphan works. As per Article 2(1) of the *Directive on certain permitted uses of orphan works* (*Orphan Works Directive*), "A work is deemed orphan if none of the rightsholders for that work are identified or, in the event that one or more is identified, none can be located despite a diligent search for the rightsholders having been carried out and recorded."[254] Should one or more of the right holders be identified or located, the orphan status of the work is terminated.[255]

The range of authorships provided for illustrates the evolution of the concept. Another copyright law mechanism that shows the privileged relationship between the author and her work falls within the scope of personality theory: moral rights. The moral rights granted to an author over creation of a work are distinct from economic rights and are not subject to harmonisation

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[249] §8(1) UrhG.
[250] Bundesgerichtshof [German Court of Justice], Karlsruhe,14 July 1993, *Buchhaltungsprogramm ("Accountin*g *Program"*), (1995) 26. I.I.C. 127 No. I ZR 47/91 (Germany), cited in Goldstein & Hugenholtz, *supra note 116 at 233.*
[251] Eechoud & Hugenholtz, *supra* note 94 at 50.
[252] *Supra* note 198 *Berne Convention* art 7(3).
[253] *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 neighbouring rights (codified version)*, *supra* note 219 art 1(3).
[254] EC, *Directive 2012/28/EU of the European Parliament and of the Council of 25 October 2012 on certain permitted uses of orphan works (Text with EEA relevance)*, [2012] OJ, L 299/5 art 2(1).
[255] Irini Stamatoudi & Paul Torremans, *EU Copyright Law* (Edward Elgar Publishing, 2021) c Directive 2012/28/EU of the European Parliament and of the Council of 25 October 2012 on Certain Permitted Uses of Orphan Works art 5.

under Union law.[256] The civil law systems of most EU Member States, notably France, are, on the other hand, strongly moral rights-oriented.[257] The connection of these rights to contract law, which is also not harmonised under Union law, further explains the absence of a uniform legal text at EU level.[258] The moral rights introduced by the *Berne Convention* are those of paternity and integrity.[259] In some systems of civil law, however, the rights of divulgation[260], and withdrawal[261] are also protected by special provisions.

The right of paternity is referred to as the "right to respect for her name, authorship and work" in French Law[262] and the "right of recognition of her authorship of the work" in German Law.[263] The right of integrity allows the author to control those modifications or derogatory actions with respect to works that "would be prejudicial [her] honor or reputation."[264] Although moral rights are widely defined and preserved in copyright systems from the *droit d'auteur* tradition,[265] the examination of honor and reputation relates at least in part to subjective criteria.

Regarding duration, moral rights are subject to the same protection period as economic rights in some Member States, while in some, they are protected indefinitely.[266] French Law, for instance, defines these rights as "perpetual, inalienable, and imprescriptible."[267] Finally, although Union law provides no harmonized prohibition, many Member States prevent the author from, or do not permit the author to, transfer rights to future work.[268]

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[256] Eechoud & Hugenholtz, *supra* note 94 at 50.
[257] Werra, *supra* note 9 c Deep Copyright by Daniel Schönberger at 157.
[258] Goldstein & Hugenholtz, *supra* note 116 at 339.
[259] *Supra* note 198 *Berne Convention* art 6bis.
[260] See e.g. L.121-2 CPI; art 12(2) UrhG, cited in Goldstein & Hugenholtz, *supra* note 116 at 344.
[261] See e.g. art L.121-4 CPI.
[262] art L-121-1 CPI.
[263] §13 UrhG.
[264] *Supra* note 198 *Berne Convention* art 6bis(1).
[265] Goldstein & Hugenholtz, *supra* note 116 at 342.
[266] Eechoud & Hugenholtz, *supra* note 94 at 255.
[267] art L.121-1 CPI.
[268] See e.g. *Code on Economic Law of February 28, 2013* (Belgium), Chapitre 2, Section 1, art XI.167 §2; 131-1 CPI; §40(1) UrhG, cited in Goldstein & Hugenholtz, *supra* note 116 at 252.

This section illuminated the author, who is central to the copyright system and its component elements. In this context, questions of whether AI can be an author, how to determine the term of protection, and how to perform moral rights can be asked. However, on the other hand, a number of copyright mechanisms are introduced for different authorship models, such as anonymous, orphan, or joint works. Since this thesis will not solely argue for AI rights, these protection models can be exemplary. The following section will analyse the concept of ownership, which is highly related to authorship.

3.4 Understanding Ownership

Having outlined the legal framework of the concept of authorship in Union law, this section will examine the concept of ownership. Under Union law, the foundational presumption dictates that the author is first owner of the copyright. However, the work-made-for-hire doctrine exists and is generally applicable as an exception to this presumption. Specific examples exist that explicitly codify the doctrine in EU law.

In principle, then, the author holds first ownership of the work in the European copyright system. Ownership is vested in the author, who has created a work that manifests a special bond, i.e., that between creator and created. Thus, the privileged rights of the author to the work are doubly intensified. Article 5 of the *Directive on the enforcement of intellectual property rights* (*Enforcement Directive*) stipulates both this authorship, and ownership, presumption.[269]

[269] EC, *Directive 2004/48/EC of the European Parliament and of the Council of 29 April 2004 on the enforcement of intellectual property rights (Text with EEA relevance)*, [2004] OJ, L 157/45 art 5. See also *supra* note 198 *Berne Convention* art 15(1).

As mentioned, the work-made-for-hire doctrine is a well-accepted exception to this presumption in systems of copyright law. Although its jurisdictional applications vary,[270] the doctrine stipulates that first ownership of a work created within the scope of an agency relationship belongs to the principal. Under agency law, an agent is a person authorized to act, and involve in legal relations, on behalf of a principal.[271] In this context, contractual, quasi-contractual, or non-contractual fiduciary relationships may exist.[272]

Computer Programs Directive Article 2(3) is one of the special provisions explicitly addressing this doctrine. Pursuant to this provision,

> *a computer program is created by an employee within the execution of her duties or following the instructions given by each employer; the employer shall be exclusively entitled to exercise all economic rights in the program so created unless otherwise provided by contract.*[273]

According to Balganesh, the American version of the doctrine is a first ownership doctrine instead of an implied transfer of ownership.[274] Some European scholars argue, however, that the provision could establish "a rebuttable presumption of transfer of rights", rather than initial ownership both because the creator doctrine is accepted in most EU Member States and the legislator leaves the bulk of authorship and ownership provisions up to the Member States' discretion.[275]

Additionally, *Databases Directive* Recital 29 permits the Member States to stipulate, in their legislation, that:

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[270] See e.g. *Dutch Copyright Act* (Netherlands) art 7, (where both authorship and ownership belong to the employer; L111-1 CPI, where sole ownership is vested to the employer). See also §43 UrhG, (where ownership is vested to the employee, without any possibility either of transfer of ownership or ex ante licenses in favor of her employer), cited in Pila & Torremans, *supra* note 15 at 273.
[271] Barfield & Pagallo, *supra* note 48 at 23.
[272] *Ibid*.
[273] *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) (Text with EEA relevance)*, *supra* note 231 art 2(3).
[274] Balganesh, *supra* note 160 at 44.
[275] Stamatoudi & Torremans, *supra* note 255 c the Software Directive by Marie-Christine Janssens at 89.

> *where a database is created by an employee in the execution of her duties or following the instructions given by each employer, the employer shall exclusively be entitled to exercise all economic rights in the database so created unless otherwise provided by contract.*[276]

This clause paves the way for Member States to introduce, or opt out of, the work-made-for-hire doctrine for databases in their national laws. In other words, Member States have the flexibility, in other words, to use their preference in determining a database's initial copyright owner.

The clause, however, cannot be interpreted as a flexibility specific and exclusive to databases. Although the existence of a provision for a specific type of work may be interpreted as inapplicable to others, according to the maxim, *expressio unius est exclusio alterius*,[277] it has not been interpreted in this way within the EU. Indeed, the Member States' discretion in this regard was protected regarding graphic and plastic artworks in the case of *Fundación Gala-Salvador Dalí and Visual Entidad de Gestión de Artistas Plásticos (VEGAP) v Société des auteurs dans les arts graphiques et plastiques (ADAGP) and Others* while discussing resale rights of Dali's works.[278] Union law, however, contains no explicit provision for applying this doctrine to all types of works.

Differentiating the concepts of authorship and ownership is vital as it shows how far EU copyright law can stretch an author's rights' limits. Therefore, the next chapter will argue different ownership models, especially the work-made-for-hire doctrine for AI-generated works.

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[276] *Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases*, *supra* note 232 recital 29.
[277] To express one thing is by implication to exclude another.
[278] *Fundación Gala-Salvador Dalí and Visual Entidad de Gestión de Artistas Plásticos (VEGAP) v Société des auteurs dans les arts graphiques et plastiques (ADAGP) and Others*, C-518/08, [2010] ECR I-03091, cited in Pila & Torremans, *supra* note 15 at 273.

Finally, having established the rights holders, the next section will focus on the subject matter of rights.

3.5 The Idea-Expression Dichotomy

Before addressing the originality criterion, which is the foundational requirement for copyright protection, another concept limiting the scope of this protection needs to be mentioned. This section will thus address the dichotomy between the idea and the expression of a work under Union law.

European copyright law does not protect the underlying ideas of works but, instead, the original expression of these ideas. Equality, a principle limiting the property rights through its obligation to provide equal access to resources has also appeared in copyright law as the non-copyrightability of ideas.[279] In addition, if an idea can only be expressed in one or a limited way, or if an idea and its expression become integrated, there will be no protection for it under copyright.[280] This distinction is defined as the idea-expression dichotomy.[281]

Article 1(2) of the *Computer Programs Directive* explicitly stipulates this distinction.[282] It is further echoed in the *Agreement on Trade-Related Aspects of Intellectual Property Rights* (*TRIPS Agreement*): "copyright protection shall extend to expressions and not to ideas,

[279] Wendy J Gordon, "A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property" (1993) 102:7 The Yale Law Journal 1533 at 1563—1564, cited in *ibid* at 23.
[280] Hartmann et al, *supra* note 9 at 72.
[281] Eechoud & Hugenholtz, *supra* note 94 at 34.
[282] *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) (Text with EEA relevance)*, *supra* note 231 art 1(2).

procedures, methods of operation, or mathematical concepts."[283] The distinction was also approved in the *Levola Hengelo BV v Smilde Foods BV [Levola Hengelo]* decision of the CJEU, in its assessment of copyright relating to the taste of a food product.[284]

Although ideas are not subject to copyright protection, a combination of unprotected ideas may constitute a creative choice and thus copyright subject matter.[285] In the *Eva-Maria Painer v Standard VerlagsGmbH and Others [Painer]* decision, the CJEU, in its assessment of the originality of a portrait photograph, provided that such creative choices can occur in the preparation, execution, or finalization of the work's creative process[286] by stating as follows:

> *(…) free and creative choices [can be made] in several ways and at various points in its production. In the preparation phase, the photographer can choose the background, the subject's pose and the lighting. When taking a portrait photograph, he can choose the framing, the angle of view and the atmosphere created. Finally, when selecting the snapshot, the photographer may choose from a variety of developing techniques the one he wishes to adopt or, where appropriate, use computer software.*[287]

The expression of creativity is the *sine qua non* for copyright protection in Union law,[288] which is based on the presumption of a causal link between the author's creative act and the resulting expression.[289] This presumption also justifies the attribution of a work to an individual because copyright law not only grants rights to, but imposes obligations on, the author.[290] When this causal link can be traced backward, a more comprehensive range of applications is enabled for the author's moral rights and liability.

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[283] *Agreement on Trade-Related Aspects of Intellectual Property Rights*, 15 April 1994, 1869 U.N.T.S. 299 Annex 1C (entered into force 1 January 1995) [TRIPS Agreement] art 9(2).
[284] *Supra* note 165 *Levola Hengelo BV v Smilde Foods BV*, C-310/17, [2018] ECR *[Levola Hengelo]* at para 39.
[285] Hartmann et al, *supra* note 9 at 73.
[286] Ana Ramalho, "Originality redux: an analysis of the originality requirement in AI-generated works" (2019) AIDA 2-18 at 7, cited in Hartmann et al, *supra* note 9 at 73.
[287] *Painer*, *supra* note 33 at paras 90-91.
[288] Hartmann et al, *supra* note 9 at 75.
[289] *Ibid*.
[290] Daniel J Gervais PhD, "The Machine as Author" (2020) 105:5 Iowa Law Review 2053–2106., cited in Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9 at 22.

The dichotomy of idea and expression is a distinction at the core of copyright law systems. A controversial situation covered by this thesis is the scenario where an AI system generates all of the possible expressions inherent in an idea. Given the complex mechanisms of AI systems, writing code, or creating a dataset are unlikely to be seen as an idea. Is a command entered into an open-source software an idea or an expression?[291] In order to analyse this, the connection between the author and the output must be traceable. To this end, the next section will outline the criterion of originality based on the premise that the work originates from the author.

3.6 Framing the Originality Criterion

For a work to be subject to protection under Union law, it must be original, and covered by Art 2(1) of the *Berne Convention*.[292] The *Term Directive* Article 1 references the *Berne Convention* Article 2(1) by referring to the copyright subject matter as "a literary or artistic work within the meaning of Article 2 of the *Berne Convention*."[293] AI system's creative capacity nowadays encompasses almost the entire list of Article 2(1).[294] This section will discuss the approach to the originality criterion under EU law since it has been controversial in the context of AI-generated works.

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[291] See Franceschelli & Musolesi, *supra* note 9 at 4 (considering machine learning as "referring to the use of ideas in data given in input").

[292] *Supra* note 198 art 2(1) (provides as follows: "The expression 'literary and artistic works' shall include every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression, such as books, pamphlets and other writings; lectures, addresses, sermons and other works of the same nature; dramatic or dramatico-musical works; choreographic works and entertainments in dumb show; musical compositions with or without words; cinematographic works to which are assimilated works expressed by a process analogous to cinematography; works of drawing, painting, architecture, sculpture, engraving and lithography; photographic works to which are assimilated works expressed by a process analogous to photography; works of applied art; illustrations, maps, plans, sketches and three-dimensional works relative to geography, topography, architecture or science".)

[293] *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 neighbouring rights (codified version)*, *supra* note 219 art 1.

[294] Hugenholtz & Quintais, "Copyright and Artificial Creation", *supra* note 9 at 1191.

The *Berne Convention* does not contain a general provision requiring all works be original for copyright protection. However, the term "original" appears in the *Berne Convention* multiple times.[295] It is, therefore, interpreted as protecting original creations.[296] *Berne Convention* Art. 2(5)[297] requires a collection of works to be an "intellectual creation" while examining its originality. Accordingly, the *InfoSoc Directive* provides that the copyright subject matter should be the product of "creative and artistic work"[298] as both the *Berne Convention* and EU copyright system are grounded in the *droit d'auteur* tradition.

Within the scope of Union law, a work's originality is expressed through the concept of "author's own intellectual creation".[299] The *Computer Programs*[300] and *Databases*[301] *Directives* employ these expressions directly. For copyright protection, the *Term Directive* provides that a photograph must be "the author's own intellectual creation reflecting her personality."[302] However, the Union law does not provide a harmonized or general definition for the originality criterion. Nevertheless, the *Infopaq International A/S v Danske Dagblades Forening [Infopaq]* case has clarified the applicability of this concept to all works while analysing the reproduction of short extracts of literary works.[303]

In addition, the criterion has been considered in detail in many other decisions of the CJEU. For originality of a garment design in *Cofemel – Sociedade de Vestuário SA v G-Star Raw CV [Cofemel]*, the Court stipulates that the work must be "original (…) in other words the

[295] See e.g. arts 2(3), 8, 11(2), 11bis(1)(ii), 14(2), 14bis(1), 14ter(1) and Appendix art IV(3) in *supra* note 198.
[296] Eechoud & Hugenholtz, *supra* note 94 at 40.
[297] *Supra* note 198 *Berne Convention* art 2(5).
[298] *Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and neighbouring rights in the information society*, *supra* note 184 at recital 10.
[299] Paul Torremans, *Research Handbook on Copyright Law* (Edward Elgar Publishing, 2017) at 59.
[300] *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) (Text with EEA relevance)*, *supra* note 213 art 1.
[301] *Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases*, *supra* note 232 art 3(1).
[302] *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 neighbouring rights (codified version)*, *supra* note 219 art 6 and recital 16.
[303] *Infopaq International A/S v Danske Dagblades Forening*, C-5/08, [2009] ECR I-06569 *[Infopaq]*.

author's own intellectual creation.[304] In the *Painer* case, the Court stated that the "intellectual creation" criterion is met when author makes free and creative choices.[305] In the *Football Dataco Ltd and Others v Yahoo! UK Ltd and Others [Football Dataco]* case, while assessing the standard of protection for football league fixture lists as databases, it excluded events from the scope of copyright that do not provide creative freedom.[306] In both decisions, the Court also indicated that this criterion was fulfilled when "author stamps her personal touch."[307] What is to be deduced from all of these decisions is that for a work to be copyrighted subject matter in Union law, it must be a work that originates from the author's "free and creative choices" and bears "her personal stamp."[308] However, what constitutes this personal stamp may be interpreted differently by Member States,[309] and is required to be somewhat discernible in the output.[310]

In the *Football Dataco* case, the Court decided that:

> *the fact that the setting up of the database required, irrespective of the creation of the data which it contains, significant labour and skill of its author (…) cannot as such justify the protection of it by copyright under Directive 96/9, if that labour and that skill do not express any originality in the selection or arrangement of that data.*[311]

In the *Cofemel* case, the Court approached the examination from a different angle and decided as follows:

> *(…) it is admittedly the case that aesthetic considerations play a part in creative activity. Nonetheless, the fact remains that the circumstance that a design may*

[304] *Cofemel – Sociedade de Vestuário SA v G-Star Raw CV*, C-683/17, [2019] ECR *[Cofemel]* at para 29.
[305] *Painer*, *supra* note 251 at para 89.
[306] *Football Dataco*, *supra* note 33 at para 39.
[307] *Painer*, *supra* note 33 at paras 90-93. *Football Dataco*, *supra* note 33 at paras 38-39.
[308] Pila & Torremans, *supra* note 15 at 252.
[309] There is no consensus on the exact meanings of the concepts of 'intellectual creation' and 'personal vision' and the European courts do not necessarily distinguish them. See e.g. Cour de Cassation, Brussels, 27 April 1989, (1989) I, 908 (Belgium); HR (Dutch Supreme Court), Lahey, 4 January 1991, *Van Dale v. Romme*, (1991), Nederlandse Jurisprudentie (NJ) 1991, 608 (Netherlands), HR (Dutch Supreme Court), Lahey, 30 May 2008, *EndstraTtapes*, LJN BC2153 (Netherlands), cited in Eechoud & Hugenholtz, *supra* note 86 at 42.
[310] Ramalho, *supra* note 9 at 29; *Contra* Hartmann et al, *supra* note 9 at 73.
[311] *Football Dataco*, *supra* note 33 at para 42.

> *generate an aesthetic effect does not, in itself, make it possible to determine whether that design constitutes an intellectual creation reflecting the freedom of choice and personality of its author, (…)*[312]

Hence, it seems that neither the aesthetic value nor the labor and skill displayed make a difference in terms of copyright protection under European copyright law.

In the originality examination, various external constraints[313] limit the author's "free and creative choices" and are taken into account by the European courts. However, these constraints will not defeat copyright protection if they still provide sufficient creative freedom to the author. This section will outline constraints necessitated by (i) specific rules in relevant field and (ii) the technical function of a work.

The first factors limiting an author's creative freedom are the rules accepted in a genre such as literature or music or a game such as football. If these rules are commonly applied, and dictate the choices made for creation of a work, then copyright protection is not granted to the work. This limitation is also imposed by the idea-expression dichotomy.

Second, the originality threshold is not met when a technical function dictates a specific form of expression. In a case like this, a monopoly would be granted to an element that should be available to everyone in the field, thereby narrowing the field of activity for other actors.

Given that AI systems are primarily mathematical functions, one might expect that each time they operate their output consist of the same expression (i.e., 1+1=2). However, the diversity in algorithms, e.g., deterministic and probabilistic models, endless possibilities in datasets, and currently incomplete and dirty data will prevent the system from producing, precisely, a consistent result. In addition, even if the data presented were complete and the output represented a purely mathematical result, that result would not constitute a particular form due to artistic

[312] *Cofemel*, *supra* note 304 at para 54.
[313] Hartmann et al, *supra* note 9 at 72.

preferences. In other words, presentation of all of the images of cats in the universe to an AI system, can 'teach' that system the characteristics and idea of a cat. The vital aim in an artistic creation, however, will never be portrayal of the ultimate cat idea since artists' purposes are frequently misaligned with practical ML applications.[314] Further, the fact that this mathematical function dictates the specific form of expression (i.e., a calico cat) does not prevent the protection of AI-generated half, or tailless, cats under copyright law. An output of such cats, however, could indicate a system that is not sufficiently optimized.[315]

Finally, copyright law does not protect facts and information. In the *Funke Medien NRW GmbH v Bundesrepublik Deutschland [Funke Medien]* decision, since the form of expression was indissociable from the informational content of a military status report, the Court indicated that the work was characterized by its technical function and not protected.[316]

The originality criterion relies on the argument that a work is an extension of the author's personality since it originates from her. This link is also the result of "authorial causation" as named by Balganesh.[317] The lack of AI personality and this causation render the originality assessment challenging for AI-generated works. On the other hand, a number of protection models in copyright law grant protection without originality examination. Therefore, the next section will consider types of neighbouring rights that do not require this criterion.

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[314] Isis Hjorth & Anne Plain, *supra* note 57 at 24. See also for subjective decision-making of algoritms when there is no "correct" answer *supra* note 92 at 206.
[315] Margaret Boden, "Creativity and Computers" in Terry Dartnall, ed, *Artificial Intelligence and Creativity* Studies in Cognitive Systems (Dordrecht: Springer Netherlands, 1994) 3 at 10—11, cited in Ana Ramalho, "Will Robots Rule the (Artistic) World? A Proposed Model for the Legal Status of Creations by Artificial Intelligence Systems" (2017) SSRN Electron J, online: <www.ssrn.com/abstract=2987757> at 13.
[316] *Funke Medien NRW GmbH v Bundesrepublik Deutschland*, C-469/17, [2019] ECR *[Funke Medien]* at para 24.
[317] Balganesh, *supra* note 160 at 35.

3.7 Neighbouring Rights

This section will cover neighbouring rights protection and types under Union law because their reliance, not solely on the concept of authorship, but also on other considerations, has expanded and diversified the scope of copyright law. In civil law systems, the rights on the technological products resulting from collaborative efforts are generally protected by the neighbouring rights regime.[318]

The first major international convention that dealt with traditional neighbouring rights was the *1961 Rome Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations* (*Rome Convention* or *RC*).[319] In the EU, this text has been harmonized with the amended *Directive on rental right and lending right and on certain rights related to copyright in the field of intellectual property* (*Rental Rights Directive*).[320] This Directive thus horizontally harmonized a neighbouring rights regime, exceeding the minimum norms of the *Rome Convention*.[321] It essentially provided the fixation, broadcasting, and distribution rights of three traditional and one novel group of neighbouring rights holders: performing artists, phonogram producers, broadcasting organizations, and film producers. The neighbouring rights regime is detailed in the *1993 Directive on the coordination of certain rules concerning copyright and rights related to copyright applicable to satellite broadcasting and*

[318] Goldstein & Hugenholtz, *supra* note 116 at 173.
[319] *International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organisations*, 26 October 1961, 496 U.N.T.S. 43 (entered into force 18 May 1964) [RC].
[320] Thomas Dreier & P B Hugenholtz, eds, *Concise European copyright law*, Concise IP (Alphen aan den Rijn, Netherlands : Frederick, MD: Kluwer Law International ; Aspen Publishers, 2006) at 121; EC, *Directive 2006/115/EC of the European Parliament and of the Council of 12 December 2006 on rental right and lending right and on certain rights related to copyright in the field of intellectual property (codified version)*, [2006] OJ, L 376/28 at 239 (The Rental Right Directive deals both with rental and lending rights, and neighbouring rights of performing artists, phonogram producers, film producers and broadcasting organizations).
[321] Eechoud & Hugenholtz, *supra* note 94 at 6.

cable retransmission (*Satellite and Cable Directive*).[322] In accordance with Article 6 of this Directive, "Member States may provide for more far-reaching protection for neighbouring rights holders than that required by the *Rental Rights Directive*."[323] Article 3 of the Term Directive provides a protection period for the four traditional neighbouring rights of 50 years from performance, fixation, or first transmission.[324] Additionally, the Directive introduced another category of neighbouring rights, namely protection for the first publication of previously unpublished works for which copyrights have expired.[325] As time passed and these rights diversified, various legal texts have been enacted in international law, including the *WIPO Performances and Phonograms Treaty* (*WPPT*).[326] When all Member States implemented the *InfoSoc Directive*, the EU acceded to *WPPT*.[327] In this Directive, five neighbouring rights holders' reproduction, communication to the public, and making available rights of works were introduced.[328]

This section will therefore refer to the rights of performing artists, phonogram producers, broadcasting organizations, film producers, press publishers, and *sui generis* protection regime for databases and rights in non-original photographs.[329] Whether the *sui generis* protection of databases is a neighbouring right or not is controversial[330] and the neighbouring rights in non-

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[322] EC, *Council Directive 93/83/EEC of 27 September 1993 on the coordination of certain rules concerning copyright and rights related to copyright applicable to satellite broadcasting and cable retransmission*, [1993] OJ, L 248/15.
[323] *Ibid* art 6.
[324] *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)*, *supra* note 219 art 3.
[325] *Ibid* art 4.
[326] *WIPO Performances and Phonograms Treaty*, 20 December 1996, TRT/WPPT/001, (entered into force May 20, 2002) [WPPT].
[327] *Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and neighbouring rights in the information society*, *supra* note 213 recital 15.
[328] *Ibid* arts 2–3(2).
[329] (Previously unpublished works are also protected under a neighbouring rights regime in EU law) See Pila & Torremans, *supra* note 15.
[330] See Hartmann et al, *supra* note 9 at 94; *Contra* Pila & Torremans, *supra* note 15 at 268; Goldstein & Hugenholtz, *supra* note 116 at 334.

original photographs exist only in certain Member States' systems. They exemplify, however, the range of protection models that EU copyright law provides. This section will not cover all aspects of these rights but will simply highlight features that may be relevant to the research questions considered in this thesis.

3.7.1 Rights of Performing Artists

No standard definition exists for performing artist or performance concepts in Union law, but *acquis communautaire* adopts the *Rome Convention* and *WPPT* provisions.[331] Some Member States have created their own definitions of performer, while others rely on the definition of the *Rome Convention*.[332] The *Rome Convention* defines performers as "actors, singers, musicians, dancers, and other persons who act, sing, deliver, declaim, play in, interpret, or otherwise perform literary or artistic works or expressions of folklore."[333] However, the *Rome Convention* permits the contracting states to expand these categories,[334] particularly to artists who do not perform literary or artistic works, such as clowns, acrobats, and jugglers.[335]

Some have argued that neighbouring rights are generally based on human and financial resources rather than creativity.[336] Although a performance does involve creativity, one of the major issues regarding the protection regime of performing artists, initially, was whether the performance constituted a work, and whether the performer could be considered to be an

[331] Eechoud & Hugenholtz, *supra* note 94 at 53.
[332] *Ibid* at 38.
[333] RC, *supra* note 319 art 3(a).
[334] RC art 9, cited in Sam Ricketson & Jane C Ginsburg, *International copyright and neighbouring rights: the Berne Convention and beyond*, 2nd ed, Book, Whole (New York;Oxford; Oxford University Press, 2006) at 1213.
[335] Claude Masouyé, Guide de la Convention de Berne pour la protection des oeuvres (Acte de Paris, 1971) (Unknown) 42, cited in *ibid* at 1213.
[336] See e.g. German Law using the term "Leistungsschutzrechte" (i.e. rights protecting performance), cited in Goldstein & Hugenholtz, *supra* note 116 at 217.

author,[337] ideas that some authors argue were a legal fiction.[338] Accordingly, some Member States had already granted performers moral rights prior to the *WPPT*,[339] and the *WPPT*, itself, rendered protection of moral rights, i.e., the rights to paternity and integrity, of performing artists mandatory to implement in national laws of contracting parties.[340]

Performing artists sit theoretically between the author and the neighbouring rights holder. In some cases, a performance might simultaneously consist of both a work and a performance.[341] Similarly, in a creative process involving AI, algorithms, data, and datasets used may be subject to copyright protection, and some scholars argue that AI output should not be additionally protected.[342] However, performing artists' rights protection exists as a counterargument.

3.7.2 Rights of Phonogram Producers

The *Rental Rights* and *InfoSoc Directives* harmonized the neighbouring rights on phonogram producers' phonograms in Union law. However, neither Directive defines a 'phonogram' or 'phonogram producer' for the neighbouring right. The *Rome Convention* does define a phonogram as an "exclusively aural fixation of sounds of a performance or other sounds" and its producer, as the "person who, or the legal entity which, first fixes the sounds of a performance or other sounds". The rationale behind this protection is the reward of producer's economic or entrepreneurial activity.[343]

[337] Ricketson & Ginsburg, *supra* note 334 at 1206.
[338] Goldstein & Hugenholtz, *supra* note 116 at 216.
[339] See e.g. art L.212-2 CPI; §74 UrhG.
[340] *Beijing Treaty* art 5, cited in Goldstein & Hugenholtz, *supra* note 116 at 332.
[341] Pila & Torremans, *supra* note 15 at 267.
[342] Nina I Brown, "Artificial Authors: A Case for Copyright in Computer-Generated Works" (2018) 20:1 Columbia Sci Technol Law Rev 1–41 at 37.
[343] Hartmann et al, *supra* note 9 at 90.

Amending Directive 2006/116/EC on the term of protection of copyright and certain neighbouring rights (*Term Amendment Directive*) proposes a 'use it or lose it' requirement for phonogram producers.[344] Under Recital 8 of the Directive,

> *the rights in the fixation of the performance should revert to the performer if a phonogram producer refrains from offering for sale in sufficient quantity copies of a phonogram which, but for the term extension, would be in the public domain, or refrains from making such a phonogram available to the public.*[345]

This regime aims to reward investment, not creativity, as in many neighbouring right regimes. This justification could also be applicable to AI-generated works. In addition, given the mass production capacities of AI technologies, a similar 'user it or lose it' requirement can be introduced for AI-generated works. Such possibilities will be discussed in the next chapter.

3.7.3 Rights of Broadcasting Organizations

Neighbouring rights are granted to broadcasting organizations to cover their broadcasts. These rights are also harmonized by the *Rental Rights* and *InfoSoc Directives*. The Directives do not provide a definition, but the *Rome Convention* defines broadcasting as "the transmission by wireless means for public reception of sounds or of images and sounds". [346]

Broadcasts were not included in the scope of authorship under the *Berne Convention* because they are produced primarily by large public organizations, for which identification of the author is a challenge.[347] Production of a sound recording or broadcast, as mentioned, is generally

[344] Pila & Torremans, *supra* note 15 at 232.
[345] EC, *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 recital 8.
[346] RC, *supra* note 319 art 3(1).
[347] Ricketson & Ginsburg, *supra* note 334 at 1206.

a collective activity.[348] Despite the protection of joint and collective works under the *Rome Convention*, the inability to precisely identify the author has led to the search for an alternative regime. In addition, the purpose of such protection would be the support of a financial investment made by that organization rather than of an individual's creative ability.[349]

Not being able to identify the author in question in this neighbouring right is a frequently encountered problem contained in the definition of AI-generated works, as discussed above. The next chapter will discuss various possibilities such as collaborative, or *sui generis* regimes as a solution to this problem.

3.7.4 Rights of Film Producers

Another type of neighbouring right harmonized by the provisions of the *Rental Rights* and *InfoSoc Directives* is a producer's right to the first fixation of a film. This right does not find its origins in the *Rome Convention*; in the European context, it can be found in the *Rental Rights Directive*, which defines a film as "a cinematographic or audiovisual work or moving images, whether or not accompanied by sound."[350] For this reason, Hugenholtz criticized the grant of this right in the first place.[351] Another of this right's essential features is that this regime has been introduced to protect non-original motion pictures, although a motion picture can be protected as an original film or audiovisual work.[352]

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[348] *Ibid*.
[349] *Ibid* at 1207.
[350] EC, *Directive 2006/115/EC of the European Parliament and of the Council of 12 December 2006 on rental right and lending right and on certain rights related to copyright in the field of intellectual property (codified version)*, [2006] OJ, L 376/28 *supra* note 320 art 2(1)(c).
[351] P Bernt Hugenholtz, "Neighbouring Rights are Obsolete" (2019) 50:8 IIC - Int Rev Intellect Prop Compet Law 1006–1011 at 1007.
[352] Hartmann et al, *supra* note 9 at 91.

In addition to the authorship regime in an audiovisual work, this neighbouring right granted to a producer will be discussed in the solutions to the research question adopted by this thesis. In this context, the fact that film producer, a neighbouring right-holder, becomes the initial owner of the work[353] and performs the rights through contractual relations despite authorship regime in practice will guide the solution to be adopted at the end of this thesis.

3.7.5 Rights of Press Publishers

In 2021, the *CDSM Directive* introduced a new type of neighbouring right for press publishers to the Member States.[354] Although the origins of copyright protection are historically can be found in publishers' rights,[355] under the European copyright system, publishers were given no rights as first right holders for a considerable period. This novel neighbouring right has its origins in German copyright law.[356] This regime reward economic or entrepreneurial investment, rather than human creativity as in other harmonized neighbouring rights regimes,[357] and expire

[353] Pascal Kamina, *Film copyright in the European Union*, second edition ed (Cambridge, UK: Cambridge University Press, 2016) at 190.
[354] *Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and neighbouring rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC (Text with EEA relevance)*, *supra* note 191 art 15.
[355] (For the regime of publishing under the ancien regime) See generally M.-C.. Dock, "Étude sur le Droit d'Auteur" (1963); H. Falk, "Les Privilèges de Librairie sous l'Ancien Régime" (1906 & Photo. Reprint 1970); E. Laboulaye & G. Guiffrey, "La Propriété Littéraire au XXVIIIe Siècle" (Paris 1859); M.-F. Malapert, "Histoire Abrégée de la Législation sur la Propriété Littéraire Avant 1789" (1881); Biro, "The Profits of Ideas: Privileges en librairie in Eighteenth-Century" France, 4 18th- Century Stud. 131 (1971); Henrion, "Appoint a l'etude des privileges de librairies aux XVle et XVlle siecles", 6 R.I.D.A. 113 (1955), cited in Jane C Ginsburg, "A Tale of two Copyrights: Literary Property in Revolutionary France and America" in Steven Wilf, ed, *Intellect Prop Law Hist*, 1st ed (Routledge, 2012) 27 at 997; (the first state grants of exclusive rights in Europe were made in Venice in 1495 and in France in 1507, again to operators of printing presses rather than authors) Stephen Breyer, "The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs" (1970) 84:2 Harvard Law Review 281, cited in Abbott & Shubov, "The Revolution Has Arrived", *supra* note 35 at 30.
[356] §87f UrhG cited in Hartmann et al, *supra* note 9 at 92.
[357] *Ibid* at 89.

two years after the publication.[358] Under Recitals 54 and 55 of the *CDSM Directive*, "the organizational and financial investments in producing press publications" should be compensated by this novel regime.[359] As per the *CDSM Directive*, Member States must grant rights of reproduction, and of making available to the public to press publishers.[360]

A recently introduced short-term regime like the neighbouring rights regime can also be an appropriate solution for AI-generated works. The next chapter will detail this option.

3.7.6 *Sui Generis* Rights of Database Makers

Article 7 of the *Databases Directive* introduces a *sui generis* database right, similarly, aiming to protect an economic investment in a database.[361]

Within the scope of Article 7, protection is provided to the database producer, on the condition that a substantial investment was made in the database production. For this reason, it is accepted that a protection threshold is introduced for this right alone, i.e., separating it from neighbouring rights.[362] The maker/producer of a database is she who takes the initiative and bears the investment risk.[363] Joint ownership could also be relevant for such investments; however, the *Databases Directive* contains no provision on this matter and leaves it to the discretion of the

[358] *Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and neighbouring rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC (Text with EEA relevance)* art15(4*), supra* note 191.
[359] *Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and neighbouring rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC (Text with EEA relevance.) ibid* recitals 54 and 55, cited in Silvia Scalzini, "The New Neighbouring right for Press Publishers: What Way Forward?" (2020) SSRN Electron J, online: <www.ssrn.com/abstract=3664847> at 108.
[360] *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.)*, *supra* note 191 art 15(1).
[361] Dreier & Hugenholtz, *supra* note 320 at 327.
[362] Hartmann et al, *supra* note 9 at 93.
[363] Dreier & Hugenholtz, *supra* note 320 at 328.

Member States.[364] The Directive grants rights holders the rights of extraction and reutilization,[365] and stipulates a protection period of 15 years from completion of the database construction.[366]

The importance of this protection is that it makes possible the provision of a complementary protection for the same-subject database, in a two-tier regime.[367] The same database, in other words, can be protected by copyright and *sui generis* right at the same time. In fact, according to Article 7(4), this *sui generis* right is protected independently of copyright and other rights protections on the same database.[368]

This subsection addressed databases protection since, as a *sui generis* regime, it introduces a threshold and provides complementary protection on a database. Such a threshold may restrict the proliferation of monopolies that may occur in the case of the protection of AI-generated works. The exemplary aspects of this regime will be discussed in detail in the next chapter.

3.7.7 Rights in Non-original Photographs

In Germany, Austria, Finland and Spain, non-original photographs are protected by a different regime, but for a shorter period.[369] The purpose of this regime is to preserve images that do not meet the originality requirement, such as simple holiday snapshots, purely technical

[364] *Ibid*.
[365] *Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases*, *supra* note 232 art 7(2).
[366] *Ibid* art 10(1).
[367] Pila & Torremans, *supra* note 15 at 268.
[368] *Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases*, *supra* note 232 art 7(4).
[369] §72 UrhG; art 118 *Intellectual Property Act* (Spain), cited in Hartmann et al, *supra* note 9 at 92. See also Eechoud & Hugenholtz, *supra* note 94 at 43.

photographs, or photographs produced with the aid of satellite or surveillance cameras.[370] This regime even covers automated taken photographs.[371] Although the Union law does not provide any special protection in this regard, Article 6 of the *Term Directive* permits Member States by stipulating that protection can be granted to non-original photographs.[372]

This regime is essential in terms of freedom granted to the Member States. The photograph is a subject matter whose protection requirements and models vary in Member States' national copyright systems. Although a harmonized regime across the EU is aimed within this thesis's scope for AI-generated works, such semi-mandatory provisions can also be introduced. This way, some degree of freedom will be offered to the Member States' legislators.

3.8 Proposals for AI Act and AI Liability Directive

As mentioned above, the European Union Parliament and Council first published a *Proposal for a Regulation on artificial intelligence technologies* in April 2021.[373] The Regulation is expected to come into effect in 2023.[374] In September 2022, they published a novel *Proposal for a Directive on adapting non-contractual civil liability rules to AI*.[375] Both texts, however, have already created a good deal of discussion in the initial phase. Although the Proposals neither

[370] See e.g. Bundesgerichtshof (BGH) [German Court of Justice], Karlsruhe, 20 December 2018, No. I ZR 104/17 (Germany) (photographs of public domain paintings protected by neighbouring right). See also OLG [Higher Regional Court], Dusseldorf, 13 February 1996, 1997 GRUR 49 and OLF [Higher Regional Court], Hamburg, 29 June 1995, §997, ZUM-RD 217; OLG [Higher Regional Court], Hamburg, 24 August 2004, (2004) ZUM 927, cited in Hartmann et al, *supra* note 9 at 92.
[371] Anne Lauber-Rönsberg & Sven Hetmank, "The concept of authorship and inventorship under pressure: Does artificial intelligence shift paradigms?" (2019) 14:7 J Intellect Prop Law Pract 570–579 at 574.
[372] *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)*, *supra* note 219 art 6.
[373] *Proposal for Artificial Intelligence Act*, *supra* note 8.
[374] Cailean Osborne, "The European Commission's Artificial Intelligence Act highlights the need for an effective AI assurance ecosystem - Centre for Data Ethics and Innovation Blog", (11 May 2021), online: *Centre for Data Ethics and Innovation Blog* <cdei.blog.gov.uk/2021/05/11/the-european-commissions-artificial-intelligence-act-highlights-the-need-for-an-effective-ai-assurance-ecosystem/> [perma.cc/GL7J-4BVL].
[375] *Proposal for AI Liability Directive*, *supra* note 8.

answer the research questions posed here, nor ask or provide any article on copyright law, this section will also address them, as they attempt to introduce an initial legal framework for AI technologies at the EU level.

This section will only refer, however, to potentially relevant objectives and provisions. It will also consider EU copyright law, together with its Directives, holistically, since the principles of EU law, and approaches underlying all of these legislative texts, are common and reveal a coherent EU legal system. For this reason, challenges that may pose difficulties for this thesis, and for such regulations in general, will be discussed as well.

The approaches toward technological developments and efforts to respond in law represented by the relevant EU laws are not new to these Proposals. Particularly in the field of copyright, the *InfoSoc Directive* states that "technological development multiplies and diversifies the creation, production, and exploitation." [376] The necessity of a coherent copyright and neighbouring rights regime for the smooth function of the internal market propelled the EU to create a legal framework such as that established by the Proposals.[377]

In May 2016, the Committee on Legal Affairs of the European Parliament implied that the IP law should protect the intellectual creations of robots and computers.[378] It was aimed at "providing a competitive advantage by expanding the framework of copyright law."[379] Finally, in the section on 'reasons and objectives' of the *Proposal for AI Act*, the EU legislator expressed its

[376] *Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society*, *supra* note 213 recital 5.
[377] *Ibid* recital 7.
[378] European Parliament, Committee on Legal Affairs, *Draft report with recommendations to the Commission on Civil Law Rules on Robotics* (2015/2103[INL]), 31 May 2016, <www.europarl.europa.eu/doceo/document/JURI-PR-582443_EN.pdf>, cited in Werra, *supra* note 9 at 145.
[379] *Ibid*.

aims to "maintain the EU's technological leadership" and to "use the newly developed technologies by the Europeans.[380]"

I will first address here the concern to create a future-proof law, common to the regulations for all technologies and emphasized in the *Proposal for AI Act.*[381] Although legal texts in general cover the status quo, the dynamism of the technologies in question demands enactment of a future-proof legal text, capable of covering future situations. Their constantly evolving character makes a stable legal framework especially difficult to create: in most cases, legislators face a dilemma. They do not want to over-regulate and so limit the development of novel technologies, but they must regulate at some point to incorporate these technologies into their legal system.

I'll, secondly, address the theoretical challenge, apart from that of its content, faced by those creating legislation regulating emergent technologies such as AI. The Collingridge dilemma implies that technologies gain momentum as they evolve and become more complex.[382] On one hand, as a new technology emerges, the lack of information about it challenges legislative efforts; on the other, its prevalence in the long run as it evolves into a practice becomes an obstacle. This dilemma is also contained within the "Amara law", i.e., "a tendency exists to overestimate the impact of technology in the short run and to underestimate it in the long run."[383] This can also be phrased as the "pacing problem,"[384] which emphasizes the difficulty of keeping up with

[380] *Proposal for Artificial Intelligence Act*, *supra* note 8 at 1.
[381] *Ibid* recital 71.
[382] David Collingridge, *The social control of technology* (New York: St. Martin's Press, 1980); Merritt Roe Smith & Leo Marx, eds, *Does technology drive history? the dilemma of technological determinism* (Cambridge, Mass: MIT Press, 1994), cited in Lyria Bennett Moses, "How to Think about Law, Regulation and Technology: Problems with 'Technology' as a Regulatory Target" (2013) 5:1 Law Innov Technol 1–20 at 8.
[383] Rodney Brooks "[FoR&AI] The Seven Deadly Sins of Predicting the Future of AI – Rodney Brooks", (7 September 2017), online: *Rodney Brooks* <rodneybrooks.com/the-seven-deadly-sins-of-predicting-the-future-of-ai/> [perma.cc/9QFY-KFHZ].
[384] Gary E Marchant, Braden R Allenby & Joseph R Herkert, eds, *The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight*, The International Library of Ethics, Law and Technology (Dordrecht:

technology while regulating it. The EU Proposals lie precisely at the center of these challenges. The EU legislator's preference for proposals over a final regulation or a directive, and the debates over their texts which have continued for more than a year and will continue more, have, to some extent, compensated for these problems.

A third consideration is the principle of technological neutrality which must be complied with during the enactment of these texts. In 2017 Resolution, the European Parliament has already called the European Commission to "support a horizontal and technologically neutral approach to intellectual property law."[385] According to this principle, "laws should be developed to be independent of, yet not blind to any particular technology."[386] In fact, the broad scope of the definition of Artificial Intelligence in the *Proposal for AI Act* complies with this principle as the provision does not require the people to whom it will be applied to search for the techniques to understand whether it falls under the scope of the provision.[387]

Despite the global reach of these technologies, another challenge faced by the EU legislator in regulating AI technologies is the difficulty – introduced by the variety of Member State approaches – of creating unified, binding, and enforceable rules at the EU level. Of course, differences in Member States come to the fore in every EU legislative text and at some point, nourish the EU law; this is, in fact, its strength. However, in terms of AI technologies, it is essential to set forth general and applicable rules for the various jurisdictions to prevent fragmentation since the race to become leader, which includes many states and structures, is on the EU's agenda. It is only in this way that other jurisdictions will not be excluded from the

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Springer Netherlands, 2011), cited in Moses, "How to Think about Law, Regulation and Technology", *supra* note 380.

[385] *European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics*, *supra* note 71 para 18.

[386] Craig, "Technological Neutrality", *supra* note 21 at 603.

[387] "Law Commission of Ontario, "Comparing European and Canadian AI Regulation", (November 2021), online: *LCO-CDO* <www.lco-cdo.org/en/our-current-projects/ai-adm-and-the-justice-system/comparing-european-and-canadian-ai-regulation/> [perma.cc/AJ8M-ALCA] at 15.

competition, and fair global progress can be achieved. The EU's strategic position and diverse structure could well give precedence to it as a supranational jurisdiction for harmonization at the global level.

As with all EU legislative acts, the Proposals therefore also adhere to the principles of proportionality and subsidiarity. These principles both represent "a constraint on the exercise of the EU legislator's competence" and support "an equitable model of law around these principles."[388] As per the principle of proportionality, the *Proposal for AI Liability Directive* also does not exceed "what is necessary to reach its legislative purposes."[389]

Along these lines, the *Proposal for AI Act* classifies AI systems according to "a risk-based approach" that imposes burdens only on those systems likely to pose high risks to fundamental rights. On the contrary, it imposes limited transparency obligations on the usage of other systems. Indeed, in line with this principle, the *Proposal for AI Act* emphasizes that these transparency obligations will not disproportionately affect the protection of intellectual property rights. In this respect, Article 17 only requires disclosure of the minimum necessary information.[390]

The Proposals' first significant advancement is the definition of Artificial Intelligence systems.[391] Article 3 of the *Proposal for AI Act* is a provision that defines and limits their area of application and can also be used to define the scope of this thesis. Such a single and future-proof definition of AI is a first for Union law. Through such a definition, the EU legislator aims to ensure legal certainty for AI systems' legal regimes.[392]

Another essential perspective within the scope of this thesis is the emphasis placed by the Proposals on the opacity of AI systems. Opacity, as discussed earlier, is the incomprehensibility

[388] See *Treaty on European Union* [2010] OJ C83/13, art 5(4); Tor-Inge Harbo, "The Function of the Proportionality Principle in EU Law" (2010) 16:2 European Law Journal 158–185, cited in Pila, *supra* note 91 at 191.
[389] *Proposal for AI Liability Directive*, *supra* note 8 at 17.
[390] *Proposal for Artificial Intelligence Act*, *supra* note 8 at 11.
[391] *Ibid* art 3.
[392] *Ibid* recital 6.

or complexity of some AI systems to natural persons.[393] In this context, a certain degree of obligation to provide transparency has been introduced for high-risk AI in the *Proposal for AI Act*. According to the principle of transparency, it should always be possible to reduce the computations of AI systems to a form understandable by humans.[394] Users, in other words, should be able to interpret their output and use it appropriately. This obligation also complies with "Lawrence Lessig's arguments that "code is law" and that the digital architecture should be considered when analysing norms and behaviours."[395] In this context, it is essential to identify the ruptures that the opacity of some systems causes to the approaches of their regulatory systems.

In the recently adopted *Proposal for AI Liability Directive*, the EU legislator explicitly outlined the challenge of proving fault and causality by the victim due to the opacity of AI systems.[396] To this end, it eases the burden of proof for non-contractual civil law claims for damages caused by AI systems through rebuttable presumptions.[397] Article 4 alleviates the burden of proof by a rebuttable presumption of causality between non-compliance with a duty of care and the AI output or the failure of the AI system to produce an output that gave rise to the damage.[398] Recognizing the difficulty of establishment of the connection between a person's fault and damage related to AI output due to the AI system's opacity, complexity, and autonomous behavior, this provision presumes, essentially, a causality between this fault and AI output.[399] In

[393] *Ibid* recital 47.
[394] *European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics*, *supra* note 71 para 12.
[395] Lawrence Lessig, "Code is Law" The Industry Standard, 18, 1999; Lawrence Lessig, *Code*, version 2.0 ed (New York: Basic Books, 2006) cited in Stefan Larsson, "The Socio-Legal Relevance of Artificial Intelligence" (2019) N°103:3 Droit Société 573 at 583.
[396] *Proposal for AI Liability Directive*, *supra* note 8 at 2.
[397] *Ibid* at 11.
[398] *Ibid* art 4.
[399] *Ibid* at 16.

principle, however, the claimant is still required to prove the fault, and the AI output or its failure to produce an output gave rise to the damage.[400]

These Proposals are crucial for the vision they provide for this thesis. The EU legislator's most up-to-date approach should be the basis for subsequent legislative work on the same topic. In addition, although the Proposals do not contain a provision directly on this subject, they are also parts of coherent and consistent integrity. The next chapter will discuss a number of options based on the perspective presented in these Proposals and other sections in this chapter.

3.9 Conclusion

This Section has outlined the general elements of Union law. Copyright law of the European Union, the preferred jurisdiction of this thesis, has thus been summarized, with elements highlighted that will make a difference to creation of a legal framework for AI-generated works.

In order first to provide a rationale for this legal system, the underlying theories of the field were discussed. The concept of authorship, which poses a problem central to systems of law and this research, was then reviewed. Analysis of the author is also an essential step in analysis of copyright law. The concept of ownership was then discussed, along with its differentiation from that of authorship. The presumption that the author is the initial copyright owner was reviewed, as was its refutation where needed. The idea-expression dichotomy, a fundamental distinction in many copyright law systems, was then clarified. Originality was then stipulated as the primary criterion of protection of the system. This distinction and criterion are aspects that considerably narrow the monopoly granted by copyright law but also add a personal dimension to copyright

[400] *Ibid* art 4.

protection. Following these, the neighbouring rights regime was discussed in its general form, with the particularities that can serve as examples, highlighted. Finally, a review of the Proposals, recently published and initiated the writing of this thesis, was disclosed as also containing the EU legislator's thoughts on the most fruitful way to approach AI.

In this way, Chapter Three has summarized the system that forms the basis for answers to the fundamental research questions posed by this thesis. From the perspective of the EU legislator, Chapter Four will discuss the various suggestions that provide these answers.

4 To protect or Not to protect AI-Generated Works: The Alternative Models

4.1 Introduction

Having primarily outlined research question posed here and a framework for AI-generated works in Chapter Two, and EU copyright law in Chapter Three, this chapter will focus on solutions and proceed by itemising those that have been proposed in the literature. At its conclusion, this chapter will recommend the one best able to harmonize the technical and legal frameworks. Many of these solutions have been discussed extensively by scholars.[401] This chapter will detail the shortcomings of current EU copyright law addressed by this literature and the proposals that have been put forward in response. However, this thesis has the opportunity to include and consider the latest state-of-the-art of AI technologies and the perspectives of the proposed AI Act and AI Liability Directive recently published under EU law. It should be noted that this thesis will not address all proposed and possible arguments but only those which seem most convincing from practical, explanatory, and normative perspectives. It will not, therefore, attempt to fit AI-generated works into existing concepts, but will, instead, develop a *sui generis* solution tailor-made for these technologies that, due to their particular difficulties, has not yet been implemented.

First, the chapter will examine a proposal to grant an electronic personality to AI systems. Discussion will be kept to a minimum, however, as this option is not only beyond the scope of the thesis and copyright law but has not been accepted by the EU legislator for now. Second, the

[401] *Supra* note 9.

chapter will discuss contractual protection, also outside copyright law, and d*e facto* applied. Third, after determining the points where contractual protection may be insufficient, the chapter will consider the possibility of not granting protection in copyright law, that is making all AI-generated works, once created, a part of the public domain. After addressing this option and justifying protection of AI-generated works under copyright, it will outline four suggestions put forward or accepted under copyright laws: creation of a fictional link between the work and the most related individual; extension of the derivative works doctrine; adoption of the work-made-for-hire system; and the granting of neighbouring rights protection. The chapter will conclude by determining the most convenient and consistent solution for the nature of this technology and EU copyright law in its entirety.

4.2 Proposed Protection Models for AI-Generated Works

4.2.1 Granting an Electronic Personality

This section will begin with a proposal that treats the legal system holistically by creating a legal actor under European law. A legal actor with a legal personality is an entity that can possess rights and obligations in a legal system.[402] AI systems do not have legal capacity: this fact lies behind every debate they have instigated in each field of law, since most AI systems can perform many acts and neglect much like a natural person. Since most legal systems are built around a natural person, or entity with a legal personality, AI technologies cannot fill or more precisely, substitute for this role, even though they can replace them in real life. For this reason, it

[402] Barfield & Pagallo, *supra* note 48 c Legal personhood in the age of artificially intelligent robots by Robert van den Hoven van Genderen at 215.

is worth mentioning the solution of granting them a legal personality. It is a solution that would seem to address AI-related questions, not only in copyright law, but in other legal areas as well.

Current liability regimes can be employed for acts and omissions that can be traced back to a person but become dysfunctional in cases where the causal link is interrupted like the case in the definition above.[403] In the Resolution dated 2017, in particular, under the title of liability, the AI system characteristics of "learning from experience and taking quasi-independent decisions" were emphasized through consideration of their autonomous and cognitive features.[404] The uncertainty in liability regime due to these characteristics was a barrier to the use of AI systems by European companies.[405] The *Proposal for AI Liability Directive* has, correspondingly, eased the burden of proof of the one claiming the non-contractual civil liability regime.[406] This deficiency and provision also relate to the possible scenarios of copyright infringement. In relation to AI, once the system has been 'trained', if the system's opacity prevents the AI researcher from understanding what it has 'learned', then she will not be able, subsequently, to explain the similarity of the AI system's outputs to existing works.[407] These outputs, however, could constitute copyright infringement.

Within the scope of the 2017 Resolution, it was proposed to create a status of electronic persons for "the most sophisticated robots," the development of which is anticipated in the

[403] See Chapter 2.4, above.
[404] *European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics*, *supra* note 71 para Z.
[405] European Commission Directorate General for Communications Networks, Content and Technology, IPSOS, & iCite, *European enterprise survey on the use of technologies based on artificial intelligence: final report.* (LU: Publications Office, 2020) at 58, cited in *Proposal for AI Liability Directive*, *supra* note 8 at 1.
[406] *Ibid* art 4.
[407] (Similar works mentioned here are not those producing (i.e., copying) the training dataset due to overfitting in the training process. Because in this example, the AI system produces the same thing as it memorizes the dataset, and this problem is a possibility that can be solved within computer science. The possibility of infringement mentioned in this thesis is the infringing results that are not caused by the training dataset or the design of the AI system but are the results of the learning process and, therefore, cannot be understood by the AI researcher. For detailed information about overfitting). See also Foster & O'Reilly for Higher Education, *supra* note 65 c Deep Learning.

future.[408] These personalities could then be held liable for any damage they caused. The Resolution indicated that this personality could also be helpful in cases where the robot makes autonomous decisions or interacts with third parties independently.[409]

Another option in the Resolution accompanying this solution is the registration of advanced robots by a European Agency.[410] For this purpose, the *Proposal for AI Act* has proposed to establish a "European AI Board"[411] and to register these systems when relevant and necessary. The following sections will address the establishment of a registration mechanism in the context of the copyright system.

By 2020, the European Parliament had published a novel resolution on Intellectual property rights for the development of artificial intelligence technologies (IPR Resolution).[412] The IPR Resolution stated that the granting of a legal personality was not an appropriate solution to protection of AI-generated content.[413] Further, it emphasized that this solution could be a source of disincentive for human creators.[414] As a matter of fact, many AI experts have stated, in an open letter to the European Commission in response to the former Resolution, that "from an ethical and legal perspective, creating a legal personality for a robot is inappropriate whatever the legal status model."[415]

Several legal scholars have also evaluated this option in conjunction with, or independently of these Resolutions. In evaluation of the proposition made by the former

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[408] *European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics*, *supra* note 71 para 59 f.
[409] *Ibid*.
[410] *Ibid* at 2.
[411] *Proposal for Artificial Intelligence Act*, *supra* note 8 art 56.
[412] EC, *European Parliament resolution of 20 October 2020 on intellectual property rights for the development of artificial intelligence technologies)*, [2020], (2020/2015(INI)).
[413] *Ibid* at 15.
[414] *Ibid*.
[415] "Robotics Openletter | Open letter to the European Commission", online: <www.robotics-openletter.eu/>, cited in Abbott, *supra* note 9 at 127.

Resolution, Ramalho referred to the analogy to the legal personality granted to legal entities.[416] She emphasized, however, that a human influence is still present in the case of legal entities; and they do not have the autonomy of AI.[417] She thus rejected this option.

On the other hand, Van den Hoven van Genderen gave several examples to illustrate the variable structure of the concept of personhood, from enslaved people in the Roman Empire who did not have rights but rather, peculium,[418] to the granting of personality to inanimate objects in today's discussions.[419] Nevertheless, the author recalled the intertwined relationship of a legal entity and the natural persons behind it by stating that the damage incurred by a company could also damage the natural persons forming it, at the least, as financial loss.[420] In contrast, this may not be the case for an AI system with a legal personality. He concluded, however, that a specific form of legal personality could be attributed to autonomously functioning intelligent systems by considering their degree of autonomy and society's social needs.[421]

Approaching the subject from the patent law perspective, Kim stated that the grant of legal personality is not necessary due to the factual nature of the act of inventing.[422] While the condition that the inventor be a natural person is required in some jurisdictions, it is not to

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[416] Ramalho, "Will Robots Rule the (Artistic) World?", *supra* note 315 at 21.
[417] *Ibid*.
[418] Barfield & Pagallo, *supra* note 48 at 218.
[419] Abigail Hutchison, "The Whanganui River as a Legal Person" (2014) 39:3 Alternative Law Journal 179–182, cited in *ibid*.
[420] *Ibid* at 236.
[421] *Ibid* at 247.
[422] Rudolf Kraßer & Christoph Ann, *Patentrecht: Lehrbuch zum deutschen und europäischen Patentrecht und Gebrauchsmusterrecht*, 7., neu bearbeitete auflage ed (München: C.H. Beck, 2016) §19 para 10; Georg Benkard & Barbara Dobrucki, eds, *Europäisches Patentübereinkommen*, Beck'sche Kurz-Kommentare Bd. 4a (München: C.H. Beck, 2002) art 60 para 15; Cf Friedrich-Karl Beier et al, eds, *Europäisches Patentübereinkommen: Münchner Gemeinschaftskommentar* (Köln: C. Heymanns Verlag, 1984). See also from a German patent law perspective Regional Court of Nürnberg- Fürth, [1968] GRUR 252, 254; Uwe Fitzner et al, eds, *Patentrechtskommentar: PatG, GebrMG, IntPatÜG, PCT und EPÜ mit Nebenvorschriften*, 4., völlig neu bearb. aufl ed (München: Beck [u.a.], 2012) para 16; Jochen Ehlers et al, "Internationale Vereinigung für den Schutz des Geistigen Eigentums (AIPPI): Berichte der Deutschen Landesgruppe für den Weltkongress der AIPPI 2015 in Rio de Janeiro, Brasilien" (2015) GRUR Int 909 (there is no legal requirement such as contractual capacity), cited in Kim, "'AI-Generated Inventions'", *supra* note 76 at 118.

designate legal capacity but to prevent legal persons from being recognized inventors.[423] The author thus suggested recognizing, not the legal personality of AI, but its inventorship and providing entitlement with special provisions regarding ownership.[424]

Abbott approached the issue in the context of criminal law. In some jurisdictions, copyright infringement may also result in criminal liability. The author thus recommended that an AI legal personality should only entail obligations, as giving personality to AI systems for punitive purposes would not necessarily entitle them to rights.[425] In addition, Abbott warned of the unintended consequences of this grant of personality, such as the over-anthropomorphization of AI systems or creeping AI rights.[426]

Finally, Lauber-Rönsberg and Hetmank indicated that this personality neither identify who could grant licenses nor who would enforce the copyright in case of infringement.[427]

Considering the shift in the EU legislator's approach, I will briefly evaluate the possibility, which has had quite a comprehensive influence on the research and remains a theoretical possibility in the EU.

The fact that the AI systems do not have legal capacity, i.e., are not entitled to have, and perform, rights and obligations, is a major impediment to their integration into copyright law. This is because, as with liability regimes, the copyright system has been designed in consideration of a natural person: although an AI system can perform some of the same acts as a

[423] *Ibid*.
[424] *Ibid*.
[425] Abbott, *supra* note 9 at 127.
[426] *Ibid* at 128.
[427] Lauber-Rönsberg & Hetmank, "The concept of authorship and inventorship under pressure", *supra* note 371 at 577.

natural person, it cannot acquire the same legal status. As a matter of fact, the authorship of a monkey or an elephant are rejected for the same reason.[428]

AI systems already exist that can make semi-autonomous or quasi-independent decisions.[429] However, the question must be asked whether the making of these decisions necessitates the granting of a personality. The level of autonomy at which that would be relevant is also an issue since the concept of autonomy is not yet uniformly defined. Parasuraman, Sheridan, and Wickens categorized autonomous systems along a spectrum.[430] The authors defined autonomy as involving varying degrees, in other words, rather than as an all-or-nothing state.[431]In fact, the term autonomy covers situations where just only one decision mechanism is transferred to an AI or robotic system and such an action may not correspond to as much as a tenth of that performed by a natural person.[432]

The former Resolution uses this holistic approach to AI systems. Even its scope, in the sense of its approach to robots and AI, is comprehensive: it disacknowledges that robotics systems can exist without embedded systems of AI.[433] The importance of this distinction is that without embedded AI, robotic systems lack the features of autonomy and intelligence that would include them as candidates for granting of a personality. The Proposals' approach to AI systems

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[428] Burkhard Schafer et al, "A fourth law of robotics? Copyright and the law and ethics of machine co-production" (2015) 23:3 Artif Intell Law 217–240 at 228; de Cock Buning, *supra* note 9 at 518; Burk, *supra* note 172 at 307.

[429] *European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics*, *supra* note 71; *European Parliament resolution of 20 October 2020 on intellectual property rights for the development of artificial intelligence technologies*, *supra* note 412 at para 59 f.

[430] R Parasuraman, TB Sheridan & CD Wickens, "A model for types and levels of human interaction with automation" (2000) 30:3 IEEE Trans Syst, Man, Cybern A 286–297, cited in Madeleine Clare Elish, "Moral Crumple Zones: Cautionary Tales in Human-Robot Interaction" (2019) 5 Engag Sci Technol Soc 40–60 at 41.

[431] *Ibid*.

[432] See generally R Parasuraman, TB Sheridan & CD Wickens, "A model for types and levels of human interaction with automation" (2000) 30:3 IEEE Trans Syst, Man, Cybern A 286–297 (Parasuraman, Sheridan, and Wickens propose ten basic levels of autonomy, ranging from the lowest level of autonomy involving a computer that offers no assistance to a human to the highest level of autonomy in which the computer makes all the decisions without any input at all from the human); *ibid*.

[433] Woodrow Barfield, "Towards a law of artificial intelligence" in *Res Handb Law Artif Intell* (Edward Elgar Publishing, 2018) 2, *supra* note 48 at 13.

on a much smaller scale is appropriate since their potential scale covers AI systems already mentioned in the Resolution that can, in the long run, exceed human intellectual capacity.[434] But in this case, as predicted in the "era of singularity",[435] where systems are created that exceed human intelligence and can comprehend people's actions better than humans themselves, the applicability of the rules of law determined by humans for these systems will be a controversial, speculative, and futuristic proposition.[436] Even mathematician I.J. Good, who was a part of Alan Turing's code-breaking group, predicted this scenario. The author expressed this process as follows:

> Let an ultraintelligent machine be defined as a machine that can far surpass all the intellectual activities of any man however clever. Since the design of machines is one of these intellectual activities, an ultraintelligent machine could design even better machines; there would then unquestionably be an "intelligence explosion," and the intelligence of man would be left far behind.[437]

In parallel, the Max Planck Institute for Innovation and Competition, in its Position Statement on IP Law and Artificial Intelligence, indicates that the degree of AI development that will be reached in the future remains uncertain.[438] For this reason, it is neither reasonable nor efficacious to attempt to foresee legal rules for systems whose processes will probably not end and that the human mind cannot, possibly after a certain point, perceive.

Several scholars have, consequently, underlined the need for a system-specific legal status rather than one that is holistic.[439] Indeed, such a personality also needs to be tailor-made to each

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[434] *European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics*, *supra* note 71 para K.
[435] (Bostrom relates this idea to "the possibility of an intelligence explosion, particularly the prospect of machine superintelligence.") Bostrom, *supra* note 20 at 2.
[436] James Grimmelmann, "There's No Such Thing as a Computer-Authored Work- And It's a Good Thing, Too" (2016) 39:3 Colum JL & Arts 403 at 403 (Grimmelman observes that such a shift would require something in the nature of a singularity to occur, in which case, 'copyright would be the least of our concerns'.), cited in Craig & Kerr, *supra* note 9 at 5.
[437] Irving John Good, "Speculations Concerning the First Ultraintelligent Machine" in *Advances in Computers* (Elsevier, 1966) 31 at 33, cited in Bostrom, *supra* note 20 at 4.
[438] Drexl et al, *supra* note 9 at 24.
[439] Barfield & Pagallo, *supra* note 48 at 247.

legal field. For instance, under current regimes, legal entities are categorized according to their purposes and functions that directly affect their rights and obligations.[440] The granting of a legal personality does not mean that this person can be recognized directly as the author of a work in copyright law, have 'life duration' in legal terms be taken as the basis for the term of protection, or own personality rights.

Considering the diversity of functions that today's AI systems perform, however, creating a special status for each may cause them to be overregulated. In addition, the boundaries of these statuses are unclear. For example, if existing traditional actors of copyright law are adhered to, authorship or ownership could be ascribed to AI system. Such a status would not result in, however, AI system's recognition as an inventor under patent law, or a taxpayer under tax law. Apart from a general provision granting this personality, then provisions applicable to the status would also need to be enacted in other areas of law or in each Member States' national laws.

As an example, the CIPO, and the Indian Copyright Office have registered an AI system as co-author of a work.[441] This is a status that has no exact equivalent even in copyright law and constitutes a title that is unlikely to be enforced by AI. If another co-author, a natural person, were not present, there would be probably no reason for granting copyright protection. All authorship rights are gathered paradoxically in the hands of this natural person, in fact, who is a co-author. Nevertheless, this identification could be the first step toward the goal of distinguishing AI-generated, from human-generated works, across the globe.

In addition, the connection between the natural persons and the legal personality may not actually function in practice. In a legal entity, a veil can be drawn, to some extent, between the

[440] Robert van den Hoven van Genderen, "Legal personhood in the age of artificially intelligent robots" in *Res Handb Law Artif Intell* (Edward Elgar Publishing, 2018) 213 at 240.
[441] *Supra* note 37; Sukanya Sarkar, *supra* note 4.

legal entity and natural persons that *de facto* fulfill most of the roles.[442] The extent to which it is necessary for the legal system to abstract the AI system from the programmer or dataset provider behind it, however, is debatable. This is because currently, although it is accepted that AI systems are rapidly advancing toward a high degree of autonomy, there are still many actions that they cannot perform on their own. A 100% AI-generated work would have no human presence in any of the creative steps performed by the machine learning model; as mentioned,[443] this is not yet possible. Some degree of human intervention is still required in their operation. For instance, an AI can write codes for another AI, and evolutionary algorithms can improve their algorithms.[444] An AI system that writes its algorithm can be developed,[445] but there will always be a need for a human being to write the initial algorithm. The dataset could be collected over the internet, but human intervention would still be needed for its curation.[446] The algorithm could be trained with unsupervised learning techniques, so that there would be no need to label the collected data. However, the output would require a human interpretation. The human being everywhere in the loop cannot simply be eliminated.[447]

Consequently, as Broussard points out, there are some things that machines will never learn; human judgment, reinforcement, and interpretation will always be necessary.[448] If AI systems could be developed to perform all of these acts, that is to be absolutely autonomous, the human beings could not possibly understand their working and output. It would be thus irrational to try to impose a system of human-created legal rules upon them. This speculative scenario

[442] Ben Allgrove, "Legal Personality for Artificial Intellects: Pragmatic Solution or Science Fiction?" (2004) SSRN Electron J, online: <www.ssrn.com/abstract=926015> at 58.
[443] See Chapter 2.4, above.
[444] "However, such techniques still considerably rely on the decision-making of human designers" Drexl et al, *supra* note 9 at 23.
[445] See Chapter 2.4, above.
[446] Darin Glasser, "Copyrights in Computer-Generated Works: Whom, if Anyone, Do We Reward?", (2001) 1 Duke Law & Technology Review, cited in Franceschelli & Musolesi, supra note 9 at 7.
[447] Hugenholtz & Quintais, "Copyright and Artificial Creation", supra note 9 at 1201.
[448] Broussard, *supra* note 47 at 119.

brings us to a problem that remains theoretical and is unlikely to need a solution anytime soon. Even if that solution were needed, I am unsure whether the current copyright law would apply to the case or to what extent it would be appropriate to discuss its applicability.[449]

4.2.2 Contract Law

After evaluating the option of granting an electronic personality to AI systems, a proposal that could have consequences for the legal system as a whole, this subsection will discuss the solutions provided within the scope of contract law, independent of copyright law. Contract law, as an independent branch of law, offers an enforceable possibility even if a solution could not be, or were not, adopted in copyright law.

For this reason, this subsection will evaluate the contractual protection before considering whether the works should be protected at all, or be uncopyrightable. It is also essential to evaluate the possibilities in this discipline before discussing those that lie within the scope of copyright law in order to distinguish between the aims of, and expectations for, copyright law. In this way, this thesis will be able to determine deficiencies in the contractual regime that copyright law might compensate for.

Although there are no harmonized provisions in contract law under Union law, the supporting character of contract law has been emphasized in a number of copyright directives. For example, the *InfoSoc Directive* allows the exploitation of copyright and neighbouring rights

[449] Gaon, *supra* note 9 at 162.

by contracts.[450] Some scholars have argued, however, that contract law should be relied upon directly rather than through establishment of a special property regime for AI-generated works.[451]

First, with the exception of copyright law, any legal regime that parties can introduce through agreement within contract law will be a powerful alternative for the legal regime of AI systems. As mentioned above, the EU Parliament admitted in its Resolution that these technologies do give rise to legal gaps in terms of contractual liability;[452] in particular, that traditional provisions cannot be enforced if their autonomous decision-making mechanisms encompass contracting, negotiating contract terms, choosing counterparties, or implementing contracts.[453]

Similarly, some scholars have argued that the liability for damages caused by AI-generated works can be eschewed through contractual terms, [454] and that explicit agreements could frame the ownership of these works. Hugenholtz and Quintais have stated that the co-authorship of AI-generated works could be resolved contractually. [455]

Currently, it seems that many tech companies rely heavily on contractual relationships. In fact, given the degree of contractual freedom, these contracts can easily modify the legal frameworks provided by copyright law for works produced with the use of AI systems. For example, the pricing scheme of a neural network algorithm, AIVA, gives the copyright to users who creates works through its premium account: but retains the copyright when the works those

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[450] InfoSoc Directive *supra* note 213 recitals 30-45, cited in Pila & Torremans, *supra* note 15 at 243.
[451] Lionel Bently, *The UK's Provisions on Computer-Generated Works: A Solution for AI Creations?* (2018), cited in Iglesias, Shamuilia & Anderberg, *supra* note 9 at 15.
[452] *European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics*, *supra* note 71 para AG (The Resolution indicates, "the shortcomings of the current legal framework are also apparent in the area of contractual liability"). See also Abbott, *supra* note 9 at 132.
[453] *European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics*, *ibid.*
[454] Bridget Watson, "A Mind of Its Own - Direct Infringement by Users of Artificial Intelligence Systems" (2017) 58:1 IDEA 29 at 83-84 cited in *Artificial Intelligence Collides with Patent Law*, White Paper, by World Economic Forum, White Paper REF 160418-case 00048540 (2018) at 12.
[455] Hugenholtz & Quintais, "Copyright and Artificial Creation", *supra* note 9 at 1219.

works are generated via its free account.[456] However, transfer of ownership according to choice of an account, even before a work is created, is open to discussion because these provisions are set forth within the scope of the membership agreement, which is entirely at the company's initiative. As expected, users are given no opportunity to discuss the terms of the contract: they take over, or transfer, ownership of the works through the agreement that accompanies the fee they pay when they become a site member.

The foregoing sketches the framework constructed in the field. Because the regime of contract law will be applicable regardless of the solutions developed within the scope of copyright law, this subsection will detail the protections it can, and cannot provide. For this reason, I'll outline the scope of contract law and the scenarios within which it can be asserted rather than the suitability of its provisions for AI-generated works.

An evaluation of the relationship between contract law and AI-generated works will begin with the possibility that these intelligent systems can be considered parties to contracts. The argument goes that AI systems, with a better understanding of, or explanation for, their works than that of the natural person behind them, should have a position in a possible contractual relationship. It is not suggested here that these systems become a direct party to the contract, as suggested in the Resolution, because such a role requires legal capacity.[457] This route brings us back to the previous option, the granting of personality to these systems,[458] which this thesis has rejected as incompatible with the European system. I'll therefore evaluate other possible roles and effects of AI systems within contractual relationships.

[456] *Supra* note 135.
[457] *European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics*, *supra* note 71 para 59 f.
[458] See Chapter 4.2.1, above.

For example, in the terms of a contractual legal framework for AI-generated works, the rights and obligations of the parties – a case in which all persons involved in the work's creation can be included – can be shaped accordingly in a contract. Another copyright area where contractual relations are frequently used is cinematographic works. Like those that are AI generated, these works are collaborative and involve many people in the creative process, the rights for whom are arranged in practice primarily by contractual relations. Contractual relations are also employed in Union law to sort out the impacts of the territorial restrictions of Member States' legal regimes and of competition and free movement principles of EU law.[459]

Contractual freedom, the primary strength of contract law, can overcome the challenges posed by lack of information and developments in the field, where uncertainty prevails. In fact, it can also serve to advantage of those who hold the information and resources. But contract law also has drawbacks compared to IP law in this context, which will be relevant to contracts regarding AI-generated works.

First, an intellectual property regime provides an absolute right that can be asserted against third parties. Since the contract relies on the parties' will, it will be binding only for those who sign it; it cannot establish a regime binding for third parties. A property regime based on the will of the EU legislator, rather than one that represents a private ordering mechanism,[460] could provide an equitable framework within which the rights and obligations for each stakeholder would be balanced, including the programmer, dataset providers, trainers, and other natural persons. However, contractual relations may not be suitable for this type of technology and output, which have a wide area of use.

[459] Pila & Torremans, *supra* note 15 at 243.
[460] *Ibid* at 74.

Second, since the contract is based upon the will of both parties, it would not be possible to conclude a contract without such a will, i.e., mutual agreement. At this point, as in every contractual relationship, bargaining power, financial resources, and legal knowledge of the parties is essential to an equitable contract. The gap increases considerably between a single internet user and a big tech company. To correct an imbalance such as this between parties, a regime introduced under the intellectual property law would avoid leaving the protection regime entirely to the parties' will and provide more stable protection for created works.

Having stressed the importance of the harmonized regulation of globally developing technologies such as AI, it remains that they must be evaluated here at EU copyright level rather than on individual basis: the uniform application of such contracts in cross-border relations would otherwise be extremely challenging.

In sum, contract law would ensure the smooth operation of the provisions envisaged in this area, and is therefore a field that offers a good alternative to copyright law, but it would not provide a completely uniform and equitable legal regime.

4.2.3 Fall into the Public Domain

After evaluating the possibilities in, or affecting, a number of different areas of Union law, this subsection will outline an option framing copyright law. This option will path the way, not only for authorship protection of AI-generated works but also for four further regimes which will be discussed under copyright law.

Uncopyrightable works are said to be part of the public domain. These can be reproduced, communicated, or modified without any form of permission from the author from the point of

their creation.[461] Referring to the relationship between the public domain and copyright protection, some scholars sought to emphasize the exceptional nature of copyright protection: it must be said at the outset that public domain works are no less important than those that are copyrighted.[462] They are only not subject to the monopoly of copyright protection because of the social cost that it would cause, i.e., the prevention of their public access and use.[463]

Some scholars have argued that AI-generated works should be uncopyrightable.[464] Schönberger has suggested that granting copyright protection to these products would mean granting legal personhood to the artificial agents.[465] He added that copyright protection is unnecessary since AI systems would not be incentivized through it.[466] In addition, he touched upon the ontological implications of this type of protection:[467] why, he asked, would a natural person sustain all the challenges of the creative process when the same protection is provided to AI-generated works?[468] All of these works, he went on to say, will be a sources of new artistic genres and areas of innovation and should be used for the good of society.[469]

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[461] Eechoud & Hugenholtz, *supra* note 94 at 197.
[462] Martin-Bariteau & Scassa, *supra* note 9 at 29.
[463] *Ibid*.
[464] Mark Perry & Thomas Margoni, *From Music Tracks to Google Maps: Who Owns Computer Generated Works?* (Rochester, NY, 2010); Werra, *supra* note 9 pp.145-173, available at: <ssrn.com/abstract=3098315>, cited in Iglesias, Shamuilia & Anderberg, *supra* note 9 at 15; Daniel J Gervais PhD, "The Machine as Author" (2020) 105:5 Iowa Law Review 2053–2106 at 19, cited in Hugenholtz & Quintais, "Copyright and Artificial Creation", *supra* note 9 at 1191; Craig, "The AI-Copyright Challenge", *supra* note 25 at 3.
[465] Werra, *supra* note 9 at 158.
[466] James Grimmelmann, *Copyright for Literate Robots* (Rochester, NY, 2015); Pamela Samuelson, "Allocating Ownership Rights in Computer-Generated Works" (1986) 47:4 1185 at 1185; Jun 28th 2016 03:20am-Mike Masnick Tue, "Another Dumb Idea Out Of The EU: Giving Robots & Computers Copyright", (28 June 2016), online: *Techdirt* <www.techdirt.com/2016/06/28/another-dumb-idea-out-eu-giving-robots-computers-copyright/>, cited in *ibid* at 159.
[467] Pamela Samuelson, "Allocating Ownership Rights in Computer-Generated Works" (1986) 47:4 1185. 104 James Grimmelmann, *Copyright for Literate Robots* (Rochester, NY, 2015) at 657, cited in *ibid* at 159; But see (The author refers to the insurance fund foreseen by the European Parliament and states that this could be an exceptional indirect incentive tool in this context. [Acknowledgments go to Burkhard Schafer].
[468] *Ibid*.
[469] *Ibid* at 160.

Craig does not consider an AI system as "author" and what it does as "authorship" from an ontological perspective.[470] The author added that the copyright law does not aim to incentivize such proliferation of monopolies resulting from AI systems' mass generation capacity.[471]

The IPR Resolution makes the following contradictory statements on the subject:

> *[The Resolution] (…) takes the view that technical creations generated by AI technology must be protected under the IPR legal framework in order to encourage investment in this form of creation and improve legal certainty for citizens, businesses and, since they are among the main users of AI technologies for the time being, inventors; considers that works autonomously produced by artificial agents and robots might not be eligible for copyright protection, in order to observe the principle of originality, which is linked to a natural person, and since the concept of 'intellectual creation' addresses the author's personality; (…), if it is considered that such works could be eligible for copyright protection; recommends that ownership of rights, if any, should only be assigned to natural or legal persons that created the work lawfully and only if authorisation has been granted by the copyright holder if copyright-protected material is being used, unless copyright exceptions or limitations apply.*[472]

In this context, the general concern of the legislators and authors in the field is that copyright law would not be able to accommodate the work surplus.[473] Since an AI system is capable of using a single word to produce, in seconds, content that a person could not create in years, the protection granted to these works would significantly increase copyright monopolies. Such protection would dilute the exceptional characteristics of these ephemeral monopolies. Having established the key issues and framework put forward by legislators and scholars, this section will now evaluate whether European copyright law should protect AI-generated works.

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[470] Craig, "The AI-Copyright Challenge", *supra* note 25 at 16; (For a discussion on a new ontological category for robots between object and agent) See Peter H. Kahn, Jr., et al., The New Ontological Category Hypothesis in Human-Robot Interaction, 2011 Proc. 6th Intl Conf. on Human-Robot Interaction 159, cited in Calo, *supra* note 75 at 532 (Calo employs the terms "robot" and "artificial intelligence" interchangeably).

[471] Craig, "The AI-Copyright Challenge", *supra* note 25.

[472] *European Parliament resolution of 20 October 2020 on intellectual property rights for the development of artificial intelligence technologies*, *supra* note 412 at para 15.

[473] Craig, "The AI-Copyright Challenge", *supra* note 25 at 2.

First, the granting of protection by the copyright system would bring legal certainty and transparency to the distinction between AI-generated, and human-generated, works and even to the identification of those that are co-authored. In this context, Craig's arguments disregard jointly generated works by AI and human beings. This assumption would lead to legal protection of works that are in fact jointly generated, as human-generated. In fact, the artifacts generated with AI assistance or contribution have been protected without disclosure since the 1950s.[474] However, as stated in the Compendium of U.S. Copyright Office Practices (Compendium), the crucial task is distinguishing works of human authorship.[475] It is, i.e., to identify whether a human, rather than a machine, "conceived and executed the traditional elements of authorship in the work."[476]

If preference were given, on the other hand, to the fall of AI-generated works into the public domain, many creators would continue to obtain the same protection as that given to human-generated works, without disclosing their AI contribution. The difference between the human and AI-generated works would not be identified, in other words, and an unenforceable regime would be introduced, probably until an entirely AI-generated work would be disclosed.

As copyright law protects only those by virtue of their acts of intellectual creation,[477] these acts need to be clearly defined. The disclosure provisions to be introduced under copyright law can objectively determine each stakeholder's role. This is important, not only because of the AI involvement but because the person obtaining the right may not have contributed to the creative process as she claimed. At the least, the intellectual works generated by these

[474] Amy X Wang, "Alan Turing's 1951 music-making machine: Researchers have restored the first computer-generated song — Quartz", (26 September 2016), online: *Quartz* <qz.com/791438/alan-turings-1951-music-making-machine-researchers-have-restored-the-first-computer-generated-song/> [perma.cc/H7DK-6UYD].
[475] US, Copyright Office, *Compendium of U.S. Copyright Office Practices*, § 101", (3d ed. 2021), online: <www.copyright.gov/comp3/chap300/ch300-copyrightable-authorship.pdf> [perma.cc/74EW-5ZP9].
[476] *Ibid*.
[477] Pila & Torremans, *supra* note 15 at 69.

technologies should be recognized and differentiated from those fully created by a human being. As IPR Resolution argued, granting these rights would also provide legal certainty both for citizens and investors.[478]

Second, the fall of AI output into the public domain works against their continued enhancement of creativity. It is the copyright system that rewards those who develop AI technologies and organize creative process, thus contributing to the larger purpose of encouraging and adding to learning, and the dissemination of ideas.[479] Copyright, as a desert-based system, aims to compensate the financial and personal needs of those who create intellectual products, on the basis of their investment in creating them.[480] Apart from the protection granted for the AI and data, copyright law would reward all forms of labour or effort given to each new artifact created with the AI system.[481] Although it has been argued by many that the AI system cannot be directly incentivized through such protection,[482] the persons behind these intelligent systems can be incentivized and the IP rights granted could stimulate investment in the research and development of these technologies.[483]

Third, the false claim of authorship for work in the public domain constitutes copyfraud.[484] Even if these creations were to be a part of the public domain, thus, false title claims on them would constitute copyfraud. Neither the laws of all Member States nor the

[478] *European Parliament resolution of 20 October 2020 on intellectual property rights for the development of artificial intelligence technologies*, *supra* note 412 at para 15.
[479] Peter Drahos, *A philosophy of intellectual property*, Book, Whole (Aldershot;Brookfield, USA; Dartmouth, 1996) at 23.
[480] Pila & Torremans, *supra* note 15 at 80.
[481] *Ibid*.
[482] Shlomit Yanisky-Ravid & Xiaoqiong (Jackie) Liu, "When Artificial Intelligence Systems Produce Inventions: The 3A Era and an Alternative Model for Patent Law" (2017) SSRN Journal, online: <www.ssrn.com/abstract=2931828>; Werra, *supra* note 9 at 157.
[483] Lauber-Rönsberg & Hetmank, "The concept of authorship and inventorship under pressure", *supra* note 371 at 576.
[484] Jason Mazzone, "Copyfraud" (2006) 81:3 N Y U L Rev 1026 at 1028.

Enforcement Directive, however, contain a provision dealing with falsely claimed authorship.[485] Through the practice of copyfraud, an individual could extend control over works beyond those for which the law provides.[486] In a similar way, AI technology permits the human being in the loop to access material beyond that which her creativity provides. This is one of reasons why contributions of AI, which seem like they were produced through a creative process, must be handled with caution. As Foucault states in *What is an Author:*

> The disclosure that Shakespeare was not born in the house that tourists now visit would not modify the functioning of the author's name, but, if it were proved that he had not written the sonnets that we attribute to him, this would constitute a significant change and affect the manner in which the author's name functions.[487]

The justification of copyright law, on the basis of unjust enrichment or unfair competition, intends to prevent people from being unjustly enriched as free riders, e.g., by reaping what they have not sown.[488] This practice distorts both the balance of the exclusionary right and the public benefit the copyright system provides to stakeholders, even though it is not explicitly sanctioned in copyright systems.

Fourth, even if copyright law would provide protection for AI-generated works, in principle, they would eventually fall into the public domain. As Schönberger argues for, thus, they could be used freely for the good of society.[489]

This section discussed the question of whether AI-generated works should be uncopyrightable. It concluded then that protection and thus commercial force should be given to these works as long as a natural person contributes something to the creative process. However,

[485] Hugenholtz & Quintais, "Copyright and Artificial Creation", *supra* note 9 at 1210.
[486] Jason Mazzone, *supra* note 484 at 1030.
[487] Foucault & Faubion, *supra* note 229 at 210.
[488] Pila & Torremans, *supra* note 15 at 81.
[489] Werra, *supra* note 9 at 160.

European copyright law offers a broad range of protection models. The following sections will, therefore, discuss the various solutions for AI-generated works under copyright law. It should be noted that these sections will not address all proposed models but only those which seem most convincing from practical, explanatory and normative perspectives.

4.2.4 Fictional Link

This subsection will consider a possibility that has already been reified and has application in a legal system: the assumption of a fictional link between AI-generated work and the most involved human being in creative process. It will begin with one of the suggestions made in British law, establishment of a fictional link between the output and the natural person controlling the intelligent system.

The UK *Copyright, Designs and Patents Act 1988* Section 9(3) provides for the authorship of computer-generated works.[490] Provisions in the laws of Ireland,[491] New Zealand,[492] South Africa,[493] India[494] and Hong Kong[495] are derivations of the above provision but for purposes of this thesis, the *UK Act*, will be taken as a basis. As mentioned above,[496] the provision distinguishes computer-generated, from human-generated, works by definition. This is also the basis of the distinction between AI-generated and human-generated work at the core of this thesis. As a consequence, it prescribes a fictional authorship rule. According to Section 9(3):

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[490] *Supra* note 34.
[491] ss 2(1) and 21(1)(f) *Copyright and Related Rights Act* 2000 (Ireland).
[492] ss 2(1) and 5(2)(a) *Copyright Act 1994* (NZ), 1994/143.
[493] s 1(1)(h) *Copyright Act* (S Afr) No 98 of 1978.
[494] s 2(d)(vi) *Copyright Act* 1957 (India).
[495] ss 11(3) and 198(1) *Cap. 528 Copyright Ordinance* (Hong Kong).
[496] See Chapter 2.4, above.

> *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 necessary arrangements for the creation of the work are undertaken.*[497]

Lord Young's 1987 statement in the House of Lords also nicely depicts the scope of application of the provision and the UK legislator's envisioned outcome of its enactment:

> *We have, however, taken account of technical advances since 1956. For example, it may already be feasible for a computer to generate works to which it would not be possible to ascribe human authorship. In order to ensure that such potentially valuable works enjoy copyright protection, the Bill makes provision to ascribe authorship in cases of so-called computer generated works. We believe this to be the first copyright legislation anywhere in the world which attempts to deal specifically with the advent of artificial intelligence.*[498]

Balganesh labelled the authorship relationship assumed by the provision "presumptive causation."[499]

In a 1988 House of Lords debate, Lord Beaverbook indicated the following on the applicability of the provision for moral rights:

> *[m]oral rights are closely concerned with the personal nature of creative effort, and the person by whom the arrangements necessary for the creation of a computer-generated work are undertaken will not himself have made any personal, creative effort.*[500]

Based on this comment, Guadamuz considered Section 9(3) an exception to the creativity and originality criteria of copyright protection.[501] However, some scholars have criticized the provision due to its failure to address the issue of originality.[502] Many authors have also variously

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[497] *Supra* note 34.
[498] UK, HL, Deb, (12 November 1987), vol 489, col 1477, online: <hansard.parliament.uk//Lords/1987-11-12/debates/9b959a7b-172a-4e28-8676-1a6747b0f370/CopyrightDesignsAndPatentsBillHl>.
[499] Balganesh, *supra* note 160 at 73.
[500] UK, HL, Deb, (25 February 1988), vol 493, col 1305, online: <hansard.parliament.uk//Lords/1988-02-25/debates/c5f12665-50ed-4b3e-8396-305c311fc545/CopyrightDesignsAndPatentsBillHl>.
[501] Guadamuz, *supra* note 9 at 177.
[502] Iglesias, Shamuilia & Anderberg, *supra* note 9 at 15.

addressed the vague concept of 'necessary arrangements.' Ginsburg criticized this ambiguity by questioning "what arrangements are required."[503] Ramalho argued that the provision could cover the investor, the programmer, the producer, the seller or user of the software, or even a combination of these.[504] The author added that the provision requires human intervention at some point.[505] Lauber-Rönsberg and Hetmank, on the other, addressed precisely this contradiction, stating that the high level of autonomy of AI systems means the number of people the provision could cover behind the AI system is many to none.[506] Another criticism raised is that the provision does not cover the works jointly generated by humans and computers.[507] Even, some scholars also argued that the provision should be amended.[508]

To date, *Nova Productions Ltd v. Mazoma Games*[509] is the only case that explicitly cites the provision, in a discussion of the copyright protection of frames and graphics created for an arcade game. That these conflicts are not more numerous may be due in part to the fact that, in most cases, the AI contribution is already hidden.[510] While referring to the possibility of numerous authors, Jacob L J made the following point regarding the user:

> *The player is not, however, an author of any of the artistic works created in the successive frame images. His input is not artistic in nature and he has contributed no skill or labor of an artistic kind. Nor has he undertaken do any of the arrangements necessary for creation of the frame images. All he has done is to play the game.*[511]

[503] Ginsburg, *supra* note 235 at 1070.
[504] Ramalho, *supra* note 9 at 59.
[505] *Ibid* at 60.
[506] Lauber-Rönsberg & Hetmank, "The concept of authorship and inventorship under pressure", *supra* note 371 at 577.
[507] Iglesias, Shamuilia & Anderberg, *supra* note 9 at 15.
[508] *Supra* note 99.
[509] *Nova Productions Ltd v Mazooma Games Ltd & Ors* [2006] EWCH 24 (Ch).
[510] Abbott & Shubov, "The Revolution Has Arrived", *supra* note 35 at 15.
[511] *Ibid* at 106.

He makes the distinction, in other words, between the user and creators of an AI system based upon the contribution of skill or labour of an artistic kind.[512] However, even this distinction does not fully clarify the provision's vague concepts.

It should also be noted that the provision existed prior to Brexit and some authors have evaluated its compatibility with the EU law. Bently, for example, has criticized the British regime for its incompatibility with EU law.[513]

It is clear from the above that the provision has played an essential role in identifying concepts key to this discussion, such as 'AI-generated work'. Having established a general framework, then, the subsection will now assess its compatibility with AI-generated works under European Union law.

The complex nature of AI systems, due possibly to their autonomy or the number of people behind them, and the inability to establish a causation relationship with one of these human beings, hinders the smooth application of copyright law. The regime just discussed was to presume a fictional causal link between the most relevant of these natural persons and the output.

As mentioned, the link posited by the provision in the *UK Act*, the first to adopt this solution, was insufficiently clear. As mentioned, and criticized, the phrase "necessary arrangements" is open to a range of interpretations.[514] With an AI system, the programmer who wrote the code takes the initial, necessary, step. However, curation of the dataset, and the use of it to train the system, are other necessary steps that can directly change the generated output. Suppose this system is DALL-E[515] or Midjourney[516], popular examples today; every word

[512] Guadamuz, *supra* note 9 at 178.
[513] Lionel Bently, *Intellectual property law* (New York, NY: Oxford University Press, 2018), cited in Hugenholtz & Quintais, "Copyright and Artificial Creation", *supra* note 9 at 1212. See also "Before the Singularity: Copyright and the Challenges of Artificial Intelligence", (25 September 2018), online: *Kluwer Copyright Blog* <copyrightblog.kluweriplaw.com/2018/09/25/singularity-copyright-challenges-artificial-intelligence/>.
[514] Ramalho, *supra* note 9 at 59.
[515] "DALL·E 2", online: *Openai* <openai.com/dall-e-2/> [https://perma.cc/2EDK-LJQG]; Metz, *supra* note 2.

entered by the user as a command is a necessary arrangement. The provision, which offers no direct guidance on which of these natural persons should be preferred, or whether collective protection should be granted, is thus insufficient in terms of its applicability.

Another issue with the provision, within the scope of EU law, is the probability that the EU legislator considered, and rejected this option. Following the June 23, 2016 referendum, the UK exited the European Union in January 2020.[517] Considering that the EU copyright directives, their proposals, and white papers that have been published and came into force until 2016 within the scope of the Union, a reasonable implication of these is that the EU legislator consciously chose to omit the UK legislator's solution. Accepted solutions on the subject of those within and without the EU were discussed: the possibility that this option was not noticed before 2016 is very unlikely.

Another factor obscuring the scope of the provision is the use of the term 'computer'. As outlined above, the term 'computer' has had various meanings throughout the history of its use.[518] Although a definition is given in the law for computer-generated works, the concept of computer is used quite broadly. Even today, while the distinction between software and hardware or between a robotic system and an AI system is widely known and emphasized, it would be appropriate to shape the terminology, in light of current usage, in a novel legal text. No matter which of the options discussed here is preferred within the scope of the EU, preference should be given to the narrower terms based on the Proposals' definition of AI. Otherwise, copyright law could be extended as far as works produced using computers and traditional software in daily life.

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[516] "Midjourney", online: *Midjourney* <www.midjourney.com/home/> [perma.cc/6Y7H-68J6].
[517] "Relations with the United Kingdom", online: *European Commission* <ec.europa.eu/info/strategy/relations-non-eu-countries/relations-united-kingdom_en> [perma.cc/J3BF-A45X].
[518] See Chapter 2.4, above.

As mentioned, another criticism of the provision that's been raised is its failure to cover works generated jointly by a person and an AI system. In fact, it is not wrong to say that its treatment completely rejects the possibility of a work generated by AI. Even the title of the provision accepts the existence of computer-generated works in reality. The author-in-law, however, to which the provision refers will be the person making the "necessary arrangements." If natural or legal persons other than this person are involved, they may also be included as persons making "necessary arrangements". However, it is clear that the provision in no way ascribes authorship to a computer or an AI system itself. Thus, the UK legislator also rejected the grant of joint authorship to AI and humans in the eyes of the copyright system. This legal policy preference also seems to hold regarding the provision's applicability and enforceability.[519]

The UK legislative text, the first on this topic, correctly identifies the legal problem in this regard and points out the lack of authorial causation. It provides the first and most functional solution workable within the traditional legal system. However, the provision's terminology and its preference for concepts far from the field of computer science limit its applicability. Designation of the preferred person as she who "mak[es] necessary arrangements" should thus be translated into modern computer science terminology. "Necessary arrangements" need to be detailed as the corresponding acts in the field, because evaluation of 'necessity' is very challenging for a technology that is so rapidly developing.

The EU legislator already has a tendency to enact directives in response to the emergence of technological innovations;[520] within the scope of copyright law, after the final versions of the

[519] Compare Craig, "The AI-Copyright Challenge", *supra* note 25 Craig's arguments would incline the human co-author to protect jointly generated works under the same regime as the human-generated ones, which is not preferable in the long term, as entirely AI-generated work is a distant possibility.

[520] de Cock Buning, *supra* note 9 at 526. See also EC, *Council Directive 87/54/EEC of 16 December 1986 on the legal protection of topographies of semiconductor products* [1986] OJ, L 24/36; EC, *Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs* [1991] OJ, L 122/42; EC, *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.

Proposals come into force, a directive could similarly be enacted to provide the regime of AI-generated works in the field of copyright law. The EU legislator is not required to stick with the wording of this Section in a future provision.

A clear choice could also be made in the provision to be introduced under EU law amongst all people involved in the generation of a work. Despite the debate on the protection type, a significant majority opinion[521] supports the granting of protection to the user. Even though interpretation of the concept of 'user' is also controversial,[522] it is clearly more instructive than the term "necessary arrangements." A fictional link based on an objective threshold (e.g., substantial investment) or other long-established legal mechanisms (e.g., agency relationship) could be preferable to ensure legal security and certainty. Finally, the EU provision could use the expression 'AI' instead of the term 'computer'. This option, then is, not a definitive solution, but it seems like a good place to start.

4.2.5 Derivative Work Regime

A number of authors have discussed the applicability of the derivative works regime to the protection of AI-generated works. An analogous approach has also been considered by the

[521] Ramalho, *supra* note 9; Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9; Samuelson, *supra* note 9; Franceschelli & Musolesi, *supra* note 9 at 9.

[522] See *Proposal for a Regulation of the European Parliament and of the Council Laying Down Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts*, *supra* note 8 art 2 (The only official user definition available in this context is "any natural or legal person, public authority, agency or other body using an AI system under its authority, except where the AI system is used in the course of a personal non-professional activity" in the Proposal for AI Act. However, this definition is not quite compatible with the user mentioned in this thesis).

EU legislator. This section will detail derivative work doctrine, particularly through the arguments of Bridy,[523] Yanisky-Ravid and Velez-Hernandez.[524]

Union law does not provide a harmonized definition of derivative works. It is generally silent on the matter because of these works' intertwined connection with unaddressed issues in Union law, such as initial ownership and authorship.[525] However, all the Member States must adhere to the *Berne Convention*, which provides an article under the title "derivative works." Under Article 2(3) of the *Berne Convention*:

> *Translations, adaptations, arrangements of music and other alterations of a literary or artistic work shall be protected as original works without prejudice to the copyright in the original work.*[526]

This provision makes mention of categories of derivative works to be protected; what it lacks are a definitive listing and a definition. U.S. law, however, defines derivative works as "any work that is based upon one or more pre-existing works."[527]

Within the scope of this regime, Bridy, Yanisky-Ravid and Velez-Hernandez consider AI-generated work to be derivative works of a generative algorithm.[528] It is an argument that has also been recently addressed by the U.S. District Court in *Rearden, LLC v. Walt Disney Co*.[529]

Bridy addressed the protection of AI-generated works as derivative works under U.S. law and discussed whether subsequent works produced could be subject to copyright due to copyright

[523] Bridy, *supra* note 9 (The author argued both the derivative works and work-made-for-hire doctrines. Even though neither is a perfect fit for AI-generated works, she recommended the work-made-for-hire doctrine as it can be more easily modified.).
[524] Shlomit Yanisky-Ravid & Luis Antonio Velez-Hernandez, "Copyrightability of Artworks Produced by Creative Robots and Originality: The Formality-Objective Model" (2018) 19:1 Minn JL Sci & Tech 1–54 (This thesis refers to three Yanisky-Ravid papers on the same subject. However, it should be noted that this one covers the most recent arguments.)
[525] Eechoud & Hugenholtz, *supra* note 94 at 65.
[526] *Supra* note 198 *Berne Convention* art 2(3).
[527] 17 U.S.C. § 101 (2011).
[528] Bridy, *supra* note 9 at 25; Yanisky-Ravid & Velez-Hernandez, *supra* note 524 at 16.
[529] *Rearden, LLC v Walt Disney Co.* 293 F Supp (3d) 963 (Dist Ct Cal 2018).

protection on the algorithm.[530] For a work to be deemed derivative in U.S. law, however, "it must contain material taken from the pre-existing work,"[531] and AI-generated works do not include any part of the generative code. Bridy, therefore, suggested expanding the concept of derivative work.[532] Then she rejected this suggestion as it would be an inapplicable extension[533] contradicting the nature of derivative works. It would be unenforceable, as the owner of the work would be the creator (here, the generative code) as long as the derivative works contain new material and are non-infringing.[534]

Yanisky-Ravid and Velez-Hernandez outlined their arguments in reference to *Rearden, LLC v. Walt Disney Co*.[535] In this case, Rearden argued that the characters produced by Walt Disney should belong to Rearden LLC and Rearden Mova LLC as derivative works on the grounds that they were produced by a system called MOVA.[536] The decision is still pending before the U.S. District Court. The link established here is derived from the copyright ownership of the AI system. Given the complexity of the AI system, however, Yanisky-Ravid and Velez-Hernandez could not determine whether the works were purely derivative or novel creations.[537]

As discussed by all authors, deeming AI-generated works derivative of an algorithm is a broad and contradictory interpretation of the doctrine.[538] As detecting such a connection between the output and the input is challenging enough; it would hardly be possible for the authorship or

[530] Bridy, *supra* note 9.
[531] See e.g. *Montgomery v. Noga*, 168 F.3d 1282, 1292 (11th Cir. 1999) (stating that "[t]o constitute a violation of section 106[2], the infringing work must incorporate a portion of the copyrighted work in some form"); *Alcatel USA, Inc. v. DGI Technologies, Inc.*, 166 F.3d 772, 787 n.55 (5th Cir. 1999) ("[T]o violate clause [2], the infringing work must incorporate a sufficient portion of the pre-existing work . . . ."); *Litchfield v. Spielberg*, 736 F.2d 1352, 1357 (9th Cir. 1984) (requiring an infringing work to "incorporate in some form a portion of the copyrighted work"), cited in *ibid* at 25.
[532] *Ibid*.
[533] *Ibid*.
[534] *Ibid* at 26.
[535] Yanisky-Ravid & Velez-Hernandez, *supra* note 524 at 15.
[536] Complaint, *Rearden LLC v. Walt Disney Co*., No. 3:17-cv-04006 (N.D. Cal. Filed July 17, 2017).
[537] Yanisky-Ravid & Velez-Hernandez, *supra* note 524 at 16.
[538] Bridy, *supra* note 9; Yanisky-Ravid & Velez-Hernandez, *supra* note 524 at 17.

ownership of the generative code. In addition, while there is currently no harmonized definition of derivative work in EU law, it cannot be expected that the EU legislator would introduce a provision that would broaden the scope of the concept.

A similar regime was addressed by a subsequently discarded provision in the draft proposal of the *Computer Programs Directive*. Article 2(5) of the draft proposal stipulated that "the person who caused the generation of subsequent programs would be entitled to exercise all rights in respect of those programs."[539] The provision added that:

> *although the human input as regards the creation of machine-generated programs may be relatively modest, and will be increasingly modest in the future . . . nevertheless, a human 'author' in the widest sense is always present, and must have the right to claim 'authorship in the program'.*[540]

The provision was excluded from the final version of the Directive since the technology was still underdeveloped.[541]

This provision is not based on the assumption that computer-generated programs are derivative works; and unlike the arguments above, the Article was introduced solely for "computer programs." Given the current state of AI technologies, however, the question arises, should this option, considered solely for software, be applied to all types of algorithm-generated works?

What needs to be discussed first is whether current AI systems are as developed as envisaged in the draft proposal. As mentioned above, AI systems do currently exist that can generate not only codes but also many types of works that would fall within the scope of Article 2 of the *Berne Convention*.[542] The connection between these works and the code that produced

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[539] Ana Ramalho, "Originality redux: an analysis of the originality requirement in AI-generated works" (2019) AIDA 2-18 cited in Hartmann et al, *supra* note 9 at 88.
[540] EC, *Proposal for a Council Directive on the legal protection of computer programs*, COM (88) 816 final, art 2(5) cited in de Cock Buning, *supra* note 9 at 526.
[541] *Ibid*.
[542] Hugenholtz & Quintais, "Copyright and Artificial Creation", *supra* note 9 at 1191.

them can therefore be considered to be "causing the generation of subsequent works."[543] This argument relates to the technical aspects of the provision, however, and will not be detailed here.

The concept, "the wide sense of author",[544] might also require a reinterpretation. In the first place, it can be accepted that the programmer, who may have an impact on all subsequent creations, can be named as the author of the AI-generated works. Theoretically, it can be argued that the programmer makes the initial creative effort by developing the code and should be rewarded. On the other hand, the computer program is also copyrighted. Senftleben and Buijtelaar explain the situation this way: "[she] is the author of the author."[545] The programmer's contribution is the *sine qua non* of the production process, but as Samuelson explains: "the programmer creates the potentiality for creation of the output, but not its actuality."[546] Should the same person obtain secondary protection just because the system is generative?[547] Nevertheless, the protection of each output, indeed, complies with copyright rationales.

It should also be accepted that the complexity of AI systems, and the multiplayer interactions of the various stakeholders, mean that the granting of protection solely to this person will not provide sufficient enforceability. Obtaining rights on the output, in the absence of knowledge of the training process and commands entered, and being held responsible in case of infringement, is not a solution that is compatible with the role of 'author' in copyright law. The broad scope of rights and obligations granted under this title does not comply with such a passive role.

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[543] Ramalho, "Originality redux: an analysis of the originality requirement in AI-generated works" (2019) AIDA 2-18 cited in Hartmann et al, *supra* note 9 at 88.
[544] EC, *Proposal for a Council Directive on the legal protection of computer programs*, COM (88) 816 final, art 2(5) cited in de Cock Buning, *supra* note 9 at 526.
[545] Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9 at 15.
[546] Samuelson, *supra* note 9 at 1209.
[547] See Brown referring to this as "two bites at the apple" Brown, *supra* note 342 at 37.

If the programmer is determined to be the author, this authorship continues for the duration of her life and the following 70 years.[548] It would be an enormous practical challenge to grant ownership to the programmer during this period for each work created by the program code. In fact, in the event of the death of the programmer, the economic rights on the work would be inherited by her heirs, and it would be a very indirect fictional link for them to acquire ownership of each of the works created for the next 70 years.

Although some scholars have argued that most users enter into a contractual or quasi-contractual relationship with the programmer in order to use AI system, the rights granted in these relations may not give her the right to monitor every creation.[549] In addition, if the user has the AI system in her possession, it will be difficult for the programmer to access every output and even be aware that the AI system has developed it.[550] This kind of tracking process is getting increasingly blurry, particularly for proprietary AI software.

Finally, granting of protection to the programmer, who then obtains all the benefits from the program and the creation process, can be disincentivizing to the user. [551] In this case, the user may refuse any fee or royalty payment to access the technology.

It is unlikely that the EU legislator would introduce a new provision to broaden the scope of this regime, which does not even have a harmonized definition under Union law. In addition, due to the opacity of the systems and multiplayer interactions, the programmer, the initial protagonist, gradually loses control as the process moves toward its end. While not denying the programmer's creative contribution to the output, this section does not consider it sufficiently dominant to enforce protection.

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[548] *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 neighbouring rights (codified version)*, *supra* note 219 art 1.
[549] Samuelson, *supra* note 9 at 1207.
[550] *Ibid* at 1208.
[551] Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9 at 16.

4.2.6 Work-Made-for-Hire Doctrine

American scholars frequently discuss the work-made-for-hire doctrine as a solution for the protection regime of AI-generated works. As explained above, this doctrine sets forth a fundamental exception in copyright law regarding ownership,[552] by creating a fictional link between the created work and a person. Different from the provision in the *UK Act*, however, is its granting of copyright ownership, and determination of the person, according to her agency in the creative process.

The application of this doctrine, for which the Article of the *Computer Programs Directive*[553] and Recital of the *Databases Directive*[554] explicitly provide, also varies by Member States.[555] It has also, although not subject to the much-harmonized provisions throughout the EU[556], been explicitly recognized in the *U.S. Copyright Act*. Under this Act, the employer is deemed the work's author, and the term of protection runs from the creation or first publication of the work.[557] The arguments of Bridy, and Yanisky-Ravid, on the issue are summarized here.

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[552] See Chapter 3.4, above.
[553] *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) (Text with EEA relevance)*, *supra* note 231 art 2(3).
[554] *Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases*, *supra* note 232 recital 29.
[555] See e.g. *Dutch Copyright Act* (Netherlands) art 7 (where both authorship and ownership belong to the employer); art L111-1 CPI (where sole ownership is vested to the employer). See also §43 UrhG (where ownership is vested to the employee, without any possibility either of transfer of ownership or ex ante licenses in favor of her employer), cited in Pila & Torremans, *supra* note 15 at 273.
[556] *Ibid.*
[557] See *Copyright Act* 17 USC §§ 201-216 (1958), s 101: (1) "a work prepared by an employee within the scope of his or her employment; or (2) a work specially ordered or commissioned for use as a contribution to a collective work, as a part of a motion picture or other audiovisual work, as a translation, as a supplementary work, as a compilation, as an instructional text, as a test, as answer material for a test, or as an atlas, if the parties expressly agree in a written instrument signed by them that the work shall be considered a work made for hire."
s 201: (a) "Initial Ownership.: Copyright in a work protected under this title vests initially in the author or authors of the work. The authors of a joint work are coowners of copyright in the work."

Bridy has stated that the doctrine bypasses the author-in-fact.[558] It thus eliminates the need to give rights to the real author (i.e., the AI system), and to incentivize it through copyright law.[559] In the sense of agency, AI-generated works do not currently arise from a contractual or a quasi-contractual relationship. However, the author has argued that *U.S. Copyright Act* Section 101 could be amended to also cover these kinds of works.[560]

Yanisky-Ravid has similarly argued for the implementation of a broader version of the doctrine. In this model, AI systems are considered to be employees or contractors.[561] Users are accepted as the owners of the output. The author added that this assumption recognizes the human-like features of AI systems, provides AI-generated works with commercial force, and potentially solves the accountability problem based on these works.[562]

Having sketched the framework of the doctrine and its related arguments, this subsection will present an argument for application of a long-established doctrine to AI-generated work by analogy and will demonstrate that this analogy fills the legal gap.

Filling a legal gap by analogy is a mechanism that has been employed in the civil law tradition for years[563] and shows that the legal system, by providing the fundamental provisions, can accommodate many possibilities. In the case of a directly enforceable provision, a legal gap will not be a question. However, legal rules can seem insufficient in the face of concepts and acts that do not fully fit into existing legal definitions, such as those used to define AI-generated works. In situations like this, it is preferable to employ options that have been previously applied

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(b) "Works Made for Hire: In the case of a work made for hire, the employer or other person for whom the work was prepared is considered the author for purposes of this title, and, unless the parties have expressly agreed otherwise in a written instrument signed by them, owns all of the rights comprised in the copyright."

[558] Bridy, *supra* note 9 at 26.

[559] See Samir Chopra & Laurence F White, *A Legal Theory for Autonomous Artificial Agents* (Ann Arbor, MI: University of Michigan Press, 2011), cited in *ibid*.

[560] *Ibid* at 27.

[561] Yanisky-Ravid, *supra* note 9 at 705.

[562] *Ibid* at 716.

[563] Katja Langenbucher, "Argument by Analogy in European Law" (1998) 57:3 Camb Law J 481–521 at 482.

rather than having the legislator enact novel regulations or directives; those recommended here will therefore comply with the principles of legal certainty and legal security. Further, in terms of rapidly developing technologies, it is best to take advantage of applied and known options to avoid the overregulation trap. These options can also be more rapidly implemented than can a legislative process.

When applying the principle of analogy, it is particularly important to adhere to the legal definitions and fundamental principles of existing mechanisms. Changing the boundaries of an existing legal instrument in a way that harms its essence would result in the loss of its functionality.[564] An analogy established in Union law would also need to be dependent on the current application of the doctrine. If the EU legislator were to make an analogy with the work-made-for-hire doctrine, its European implementation would be based on, not the U.S. one. This section will therefore consider the jurisdictional differences between Union, and U.S., law.

As explained above, the work-made-for-hire doctrine does appear, though in a limited way, in Union law. With a provision similar to the one in the *Computer Programs Directive*, an identified natural person would, unless otherwise stipulated in a contract, be entitled to economic rights over an AI-generated work. With this in mind, although the EU legislator could adopt a different provision from that in the *Computer Programs Directive*, it would not be her preference in terms of consistency and legal certainty.

The fundamental element of such a solution will be the designated natural person, rather than the employer or principal as in the original version of the doctrine, and most scholars, at this

[564] For a discussion of how a legal fiction erodes the rule it was initially meant to preserve, see Ian Kerr, Prenatal Fictions and Postpartum Actions, 20 Dalhousie L. Rev. 237 (1997) (relied upon, with approval, by the Supreme Court of Canada in Dobson [Litigation Guardian of] v. Dobson, [1999] 2 S.C.R. 753 [Can.], cited in Craig & Kerr, *supra* note 9 at 22.

point, seem to grant rights to the user.[565] This is consistent with the "first connection thesis" as the person who is first connected,[566] i.e., the user, will also acquire ownership of the work produced by the system. For AI systems, the user can be defined as the 'person who employs the AI system.'[567] Because an ownership regime is provided, however, the principle of accession in property law, derived from Roman Law, can apply: the owner of a tree is considered to be the owner of its fruits.[568] The entitlement of the person who financially supported the development of the AI system, the copyright owner and more directly, the physical system's owner, can also be recognized. A structure where several persons have entitlement can also be constituted. Several options are therefore available for the choice of person to whom the rights will be granted.

Other theoretical problems relate to this option. An agency relationship, a theory that relies primarily on the parties' will, requires for the parties to have a legal capacity. AI systems are currently do not possess a legal personality. But referred agency relationship between agent and principal includes the work produced within that relationship framework. As long as this work is in accordance with the agency relationship's framework, the work created is also considered to lie within its scope. Otherwise, the person who produced the work is regarded as its copyright owner.

As detailed above, however, the contribution of AI technologies intervenes in the authorial causation or the fragile bond between the work and the author. At one point, as the AI system moves far beyond the possibilities envisioned by its user or owner, the regime to which the output will be subject is debatable. In the work-made-for-hire relationship, the agent is considered to make an authorial intervention, but her will is interpreted as her creation of a work

[565] *Supra* note 521.
[566] P. Drahos, A Philospohy of Intellectual Property (Dartmouth, 1996), 108-14 201-2 cited in Pila & Torremans, *supra* note 15 at 87.
[567] See "Final Report on the National Commission on New Technological Uses of Copyrighted Works" (1981) 3:1 Computer LJ 53 at 45 cited in Abbott & Shubov, "The Revolution Has Arrived", *supra* note 35 at 22.
[568] Thomas Merrill, "Accession and Original Ownership" (200AD) 1 J Legal Analysis 459, cited in *ibid* at 37.

within her competence. The agent agrees, or it is deducible from the circumstances of the situation, that she produces the work on behalf of the principal and, in the process, follows principal's will. Otherwise, the doctrine cannot be applied. In fact, the intended scope of delegation determines the scope of both the relationship and the output.[569] The direction of the intention of the AI system cannot be determined, and in fact, there is no such thing as an AI system's intention. The agency relationship cannot be constituted without these anthropomorphic concepts. Final difficulty with application of the doctrine is discussed below.

Although the term 'agent' is employed for AI systems in the field of computer science, in a legal context, it has a different meaning. An agent in computer science is defined as "an autonomous entity which observes the world through sensors and acts upon an environment using actuators and the agent directs its activity towards achieving goals in a rational manner."[570] Agency law, however, as explained above, is a legal field that provides a regime of certain relations.[571]

AI systems, as explained, lie outside this analogy. Some authors compare the working principles of AI systems to the tutoring of a minor[572] or the direction of an animal[573] and then claim of ownership over their creations. The work-made-for-hire doctrine cannot be applied in any of these situations, either directly or by analogy, because the act of a minor or a monkey is intervened in the creative process in such a way as to eliminate, or prevent expression of, the will of the person controlling it.

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[569] Ginsburg & Luke Ali Budiardjo, *supra* note 9 at 361.
[570] Barfield & Pagallo, *supra* note 48 at 22.
[571] See Chapter 3.4, above.
[572] Bostrom, *supra* note 20 at 29; Schafer et al, "A fourth law of robotics?", *supra* note 428 at 231; Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9 at 11; Yanisky-Ravid, *supra* note 9 at 675.
[573] J Jason Tanz, "Soon We Won't Program Computers. We'll Train Them Like Dogs", online: *Wired* <www.wired.com/2016/05/the-end-of-code/> cited in Werra, *supra* note 9 at 169.

As can be seen, this doctrine is based entirely on the agency relationship, and no analogy can be made with it due to the lack of the personality of an AI system. If a fictional link is constituted without consideration of agency, it brings the discussion back to the *UK Act* provision, which was discussed above.[574]

4.2.7 Neighbouring Rights Protection

The arguments on whether the neighbouring rights offer an adequate protection regime for AI-generated works in Union law will be summarized now. This section will consider several European scholars' arguments[575] and nuances to propose a framework of protection and assess its compatibility with AI-generated works.

As outlined above, neighbouring rights protection constitutes an essential part of EU copyright law in accordance with the *Rome Convention*.[576] At this point, it should be noted that, unlike the situation with the systems from common-law tradition, the regimes of copyright and neighbouring rights protection differ in Union law. Not all the author rights are granted to a neighbouring right holder,[577] whose rights vary according to the subject matter. For this reason, this is an area within which the EU legislator has more legislative freedom, and where tailor-made protection regimes are present. Several authors have thus highlighted the flexibility of this option for AI-generated works.

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[574] See Chapter 4.2.4, above.
[575] See e.g. Ramalho, *supra* note 9; Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9; Lauber-Rönsberg & Hetmank, "The concept of authorship and inventorship under pressure", *supra* note 371; Hartmann et al, *supra* note 9.
[576] See Chapter 3.7, above.
[577] *Ibid.*

Ramalho has discussed this proposal extensively for protection of AI-generated works, and suggested introducing an authorless protection with a *sui generis* neighbouring right regime: "disseminator's right."[578] This regime would reward those who make AI-generated works available to the public;[579] and it would be necessary first, Ramalho added, to empirically examine whether these works' dissemination would be necessary for copyright law to foster.[580] Other points to which the author drew attention are the lack of protection threshold of the neighbouring rights regimes,[581] and the legal uncertainty created by the 'substantial investment' threshold of the *sui generis* databases protection.[582]

Senftleben and Buijtelaar, in their assessment of the AI system user's contribution, made an analogy with other neighbouring right regimes,[583] such as those of phonogram and film producers whose investment allows them to obtain neighbouring right protection. The authors also warned about overprotection, in hand with Ramalho, and suggested, for example, that the "right to prevent use" can be converted to the "right to payment of equitable remuneration."[584]

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[578] Ana Ramalho, "Will Robots Rule the (Artistic) World? A Proposed Model for the Legal Status of Creations by Artificial Intelligence Systems" (2017) SSRN Journal, online: <www.ssrn.com/abstract=2987757> cited in Iglesias, Shamuilia & Anderberg, *supra* note 9 at 15.
[579] Ramalho, *supra* note 9 at 63.
[580] *Ibid* at 64.
[581] *Ibid*.
[582] EC, *Commıssıon Staff Workıng Document A Digital Single Market Strategy for Europe - Analysis and Evidence Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions A Digital Single Market Strategy for Europe*, (2015), cited in *ibid*.
[583] Cf. Madeleine de Cock Buning, "Artificial intelligence and the creative industry: new challenges for the EU paradigm for art and technology by autonomous creation" in *Research Handbook on the Law of Artificial Intelligence* (Edward Elgar Publishing, 2018) at 322 (arguing for a *sui generis* right). See also Marie-Christine Janssens & Frank Gotzen, "Kunstmatige Kunst. Bedenkingen bij de toepassing van het auteursrecht op Artificiële Intelligentie" (2020) 2018–2019:3 Auteurs en Media at 333 (mentioning a neighbouring rights approach as an alternative protection); Ana Ramalho, "Will Robots Rule the (Artistic) World? A Proposed Model for the Legal Status of Creations by Artificial Intelligence Systems" (2017) SSRN Journal, online: <www.ssrn.com/abstract=2987757> (stating that it would be best to leave robot-generated works in the public domain or create a "disseminator's right" that is limited in scope to ensure that robot-generated works are brought into public circulation, while at the same time avoiding privatization), cited in Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9 at 19.
[584] *Ibid*.

Finally, they argued for the appropriateness of a shorter term of protection, in line with the regime recently introduced for press publishers.[585]

Lauber-Rönsberg and Hetmank have questioned the criterion that would be used to determine substantive protection, offering "substantial investment" or "creative achievement" as protection thresholds.[586] They argued that the distinction between human, and AI-generated, works can often cause legal uncertainty.[587] They emphasized that in order to avoid creating the impression that AI-generated works are "better" than those created by humans, such a relationship of superiority should not be established between them.[588] Such a superiority to human works could be ruled out by defining the requirements and scope of protection clearly and strictly, despite the difficulty of doing so in the subjective regime of copyright.[589]

In general, all of these scholars evaluated neighbouring right protection as a good and workable regime, assuming that it would incentivize investment in the AI system by the person behind it. A focus on the human being behind the system rather than the system itself would still create a regime that complies with copyright law rationales.

The European Commission examined this proposal in detail in its 2020 Trends and Developments in Artificial Intelligence report.[590] The report noted that AI-assisted outputs could be accommodated in Union law within existing regimes, i.e., the rights of phonogram producers, broadcasters, film producers, and publishers of press publications, since these do not impose originality or otherwise prerequisites for a threshold.[591] However, as mentioned above, the

[585] *Ibid*.
[586] Lauber-Rönsberg & Hetmank, "The concept of authorship and inventorship under pressure", *supra* note 371.
[587] *Ibid* at 578.
[588] *Ibid*.
[589] *Ibid*.
[590] Hartmann et al, *supra* note 9 at 94.
[591] *Ibid* at 89.

report's definition of 'AI-assisted output' is too broad, and its conclusion does not answer questions regarding who, or what, the author or right holder will be.[592]

Finally, the report specified that solid empirical analysis should be relied upon to introduce a new neighbouring right regime.[593] It indicated that there was no need for protection beyond existing regimes without establishment of market failure, and no findings of this were reached during its preparation.[594] This statement can be interpreted as the EU legislator's justification for not introducing a *sui generis* neighbouring right regime.

This argument is additionally echoed in the 2021 Position Statement of the Max Planck Institute for Innovation and Competition. The Position Statement identified two strands of justification for introducing a new copyright regime:[595] the deontological argument, favouring the creator's personality and efforts; and the economic-utilitarian argument supporting compensation for market failure.[596] The authors concluded that the former justification is irrelevant given the "lack or insufficient involvement of a human creator" and the latter requires "a market failure."[597]

In sum, neighbouring rights protection is a regime that differs from copyright protection and offers an alternative for it in legal systems from the *droit d'auteur* tradition. Especially in Union law, as mentioned above,[598] this protection has been preferred over copyright protection for various creations at various times and for various reasons. This thesis will address the

[592] See Chapter 2.4, above.
[593] Hartmann et al, *supra* note 9 at 95.
[594] See 2019 AIPPI World Congress, *London Adopted Resolution on Copyright in artificially generated works*, (18 September 2019): "As AI is still developing, it is too early to take a position on the question, whether AI generated works not covered by such existing protection should be eligible for exclusive rights protection as a Neighbouring right or as exclusive rights under copyright (not in the meaning of the RBC)". See also submissions to WIPO Conversation on IP and AI, available at <www.wipo.int/about-ip/en/artificial_intelligence/policy.html#submissions>, cited in *ibid*.
[595] Drexl et al, *supra* note 9 at 22.
[596] *Ibid*.
[597] *Ibid*.
[598] See Chapter 3.7, above.

particular views of authors mentioned above, as well as other issues that may be important for the suitability of this kind of protection for AI-generated works that have not yet been mentioned.

Previous subsections have presented the arguments for the necessity of a protection regime under copyright law,[599] none of which, it should be noted, directly involved an AI authorship regime. This subsection will proceed by claiming why the neighbouring rights regime might be a more proportionate alternative.

According to the natural rights justification underlying European copyright law, intellectual products are extensions of personhood.[600] Some scholars, however, have argued that the fact that humans are needed for the technology to produce a work does not mean that the work reflects their personalities.[601] As Weinrib claimed, the concept of 'creative process' should thus be interpreted in relation to current conditions in art and technology[602]to determine whether an AI creation does fall within its scope, as this interpretation will also affect the content of the concepts of authorship, neighbouring rights, and originality in copyright law.

When an AI is involved in the creative process, it seems that individuals exceed their creative spheres. Generative AI systems operate on a basis that is probabilistic, not deterministic.[603] The user, in other words, commands an AI to create the artistic probabilities according to what it understands from the input, not the specific creative probability she envisions. This works against copyright law which aims to promote the importance of individual

[599] See Chapter 4.2.3, above.
[600] Pila & Torremans, *supra* note 15 at 79; Hegel, *supra* note 208 at 55. See also Chapter 3.2.1, above.
[601] Sturm et al, "Artificial Intelligence and Music", *supra* note 9 at 4.
[602] Pila & Torremans, *supra* note 15 at 88.
[603] Franceschelli & Musolesi, *supra* note 9 at 2.

creativity[604] and the author's autonomy.[605] In most cases, the AI user does not maintain this kind of individual creativity or autonomy as AI's autonomy intervenes in it.[606]

The inability to fully understand the point reached by that technology could also inhibit human creativity in the long term.[607] AI systems can produce faster and more effectively with the latest technology than humans can create works. The capacity of these systems for mass production could very well increase the motivation to use them in the relevant industries and reduce the need of these industries for a human labour force. In practice, a natural person competing with an AI has the possibility of either directing her creativity to a different field or abandoning the particular sector.[608] As Schönberger argues, why would a human being bother to create a painting for the same protection when an AI system can produce one in a tenth of the time?[609]

From the perspective of *proprietarianism*, everything an AI can create is capable, in theory, of being created and owned by a human being, or more reasonably many human beings.[610] Considering the mass production capacity of an AI, those who obtained monopolies for its artifacts would also interfere with the creative capacity of the community of artists by removing possibilities from their sphere of potential artworks.[611] The claimed authors would gain an unfair economic advantage by flooding sectors with AI productions for the same reason: it

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[604] Drahos, *supra* note 479 at 15.
[605] Pila & Torremans, *supra* note 15 at 78.
[606] As neural networks can make inference from examples and find hidden patterns in the input, the AI researcher is not required to train AI on the definition of the categories or the features to be weighted see Bostrom, *supra* note 20 at 8; Ramalho, "Will Robots Rule the (Artistic) World?", *supra* note 315 at 20.
[607] "This post was written by a human", online: <www.cbsnews.com/news/this-post-was-written-by-a-human/>, cited in Schafer et al, "A fourth law of robotics?", *supra* note 428 at 229.
[608] Lauber-Rönsberg & Hetmank, "The concept of authorship and inventorship under pressure", *supra* note 371 at 576.
[609] Werra, *supra* note 9.
[610] Pila & Torremans, *supra* note 15 at 87; Drahos, *supra* note 479 at 18.
[611] Clark D Asay, "Independent Creation in a World of AI" (2020) 14:2 lawreview, online: <ecollections.law.fiu.edu/lawreview/vol14/iss2/5>, cited in Craig, "The AI-Copyright Challenge", *supra* note 25 at 24.

would constrict the vast sea of potential contributions of other sectoral stakeholders. Although a legally recognized competitive nexus between AI and human beings involved in the production process does not yet exist, the long-term involvement of AI technologies in a number of industries may create a system of horizontal competition.[612]

Copyright systems cannot prohibit the increasing use of AI systems or the proliferation of AI output. The individuals' behaviours, however, can be channeled in the desired way as per the utilitarian theory[613] by providing adequate protection to humans involved in the creative process before workforce erosion in the affected sectors occurs.[614]

Finally, this protection complies with the principle of proportionality by providing more limited protection than does authorship in civil law systems. Copyright and neighbouring rights protection should provide no greater control than that strictly necessary,[615] since these monopolies prevent the free circulation and dissemination of works of art.

The arguments given so far could also be grounds for the refusal of copyright protection, but this thesis is concerned, instead, to find a protection regime that is fair, proportionate, and easily applicable to AI-generated works. It thus recommends a deviation from the traditional authorship regime. Additionally, several practical reasons exist for considering neighbouring rights protection a better alternative than copyright in some instances for AI-generated works.

First, this regime has emerged for neighbouring rights holders such as broadcasters where, within the creative process, an author cannot be chosen between several persons, including legal

[612] Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9 at 21; Sturm et al, "Artificial Intelligence and Music", *supra* note 9 at 12.
[613] Pila & Torremans, *supra* note 15 at 85.
[614] See e.g. critiques of granting an award to AI-generated work Kevin Roose, "An A.I.-Generated Picture Won an Art Prize. Artists Aren't Happy.", (2 September 2022), online: *The New York Times* <www.nytimes.com/2022/09/02/technology/ai-artificial-intelligence-artists.html> [perma.cc/BF6W-5WR3].
[615] Ginsburg, *supra* note 355 at 29.

entities.[616] Similarly, AI-generated works are too complex to establish a connection with a natural person.[617] For this reason, it would be more appropriate to provide an authorless model of protection, as Ramalho has suggested,[618] and a neighbouring right to natural persons involved in the creative process. The absence of authorial causation with a specific individual in these works, thus, would be emphasized. It should be noted that the neighbouring right holder and the author of these works do not need to be the same person. While the composer is the composition's author, for example, the performer performing it obtains the neighbouring right. In fact, anonymous works have been protected for years within the scope of Union law in parallel to the *Rome Convention*.[619] When an anonymous work is performed, the performers may have a neighbouring right over their performance; in parallel, a natural person could have a neighbouring right on an authorless AI-produced work.

Neighbouring rights protection does not preclude copyright protection for the same work. While both types of protection may coexist on a work, neighbouring rights protection may come to the fore in cases of particular forms of authorship, such as with anonymous or collaborative works. In this context, if an authorless protection regime were not proposed, the double layering of rights could be cause for concern. In this thesis' proposal, however, in terms of enforcement, the neighbouring rights are preferable for right holders.

Second, copyright protection gives the author extensive copyrights, including the right to block non-mechanical and non-literal reproductions of the work; however, neighbouring rights holders obtain narrower protection.[620] Limiting the scope of protection will limit not only the rights but also the obligations of the right holder. In this way, the possibilities of infringement can

[616] Ricketson & Ginsburg, *supra* note 334 at 1206.
[617] See Chapter 2.4, above.
[618] Ramalho, *supra* note 9 at 63.
[619] *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 neighbouring rights (codified version)*, *supra* note 219 art 1(4).
[620] Pila & Torremans, *supra* note 15 at 249.

be restricted for AI-generated works that can be rapidly reproduced and circulated on the internet. In addition, liability can be limited if the role of each stakeholder involved in the creative process can be objectively determined. This is because the way in which the programmer writes the code, or any measures taken against overfitting problems[621] during the training process with the dataset, will affect the AI system's ability to produce new work rather than simply copying the data provided to it. The natural persons involved, each with a different task, must not be held responsible for each other's acts, particularly when the user is a non-professional creating content on the internet with a software, without being given the opportunity to discuss the terms of the software license agreement.

Many authors have argued that protection should be granted only to the user: [622] for the reason just stated, this thesis does not. What is recommended instead is a regime like collaborative works, especially cinematographic works. In a collaborative protection regime, as in joint works protection, all rights holders can constitute each other's restrictions. In this way, it is ensured that stakeholders, and their roles, can be objectively determined and their bargaining power, balanced. However, joint authorship is not the final recommendation due to the lack of "concerted creative effort."[623]

In addition, if protection is granted to one individual, she would always be able to circumvent the law. As Ramalho warned, this person could create "copyrightable derivative works" whose author herself would be.[624] However, in a collaborative framework, each right holder would limit others' subsequent modifications. Such circumvention of law would still be

[621] *Supra* note 140.
[622] *Supra* note 521.
[623] Paul Goldstein & P B Hugenholtz, *International copyright: principles, law, and practice*, fourth edition ed (New York, NY: Oxford University Press, 2019) at 233; See Cass civ 1e, 18 October 1994, [1995] 164 R.I.D.A. at 304-308, cited in Hugenholtz & Quintais, "Copyright and Artificial Creation", *supra* note 9 at 1208.
[624] Robert Yu, "The Machine Author: What Level of Copyright Protection is Appropriate for Fully Independent Computer Generated Works" (2017) 165:5 U Pa L Rev 1245 at 1264-1265 cited in Ramalho, *supra* note 9 at 62.

possible under this thesis' proposal as its drawback if only one individual is behind the whole process. It should, however, be noted that even the current copyright system does not prevent any individual from creating derivative works from authorless works, such as anonymous ones.

Another solution in this regard is the registration system, which has a broad application in common law tradition copyright systems,[625] and is available in civil law systems for audiovisual works.[626] With an EU-wide registration, individuals involved in the creation of AI-generated works could be registered as rights holders. The protection regime should not require this registration, but registration could be necessary for litigation.[627]

Such a record would allow all persons involved in the creative process to prevent one individual from obtaining authorship without disclosing the AI contribution. Any one of these persons, that is, could thus be prevented from falsely claiming the authorship of the work. This regime will not fully ensure that a natural person will disclose every type of AI contribution. This brings us to the limits of copyright law, i.e., what it can and cannot do. At this point, it may be more appropriate to expect the solution from the technology itself. In the long term, novel systems could be used by IP Offices to determine whether AI was involved in the production of a work. This use would obviate a registration system based upon someone's declaration.

In addition, by establishing a separate category of registration, this system would comply with the current practices of the CIPO and the Indian Copyright Office to 'label' AI-generated works. Hence, rather than identifying a functionless co-author, a particular characteristic of the work would be publicly disclosed.

[625] See e.g. the voluntary system of registration of the U.S. in 17 U.S. Code § 411, cited in Guadamuz, *supra* note 9 at 15.
[626] Kamina, *supra* note 353 at 85.
[627] Compare *ibid*.

In the long term, infringement claims could also be augmented related to the data used to feed AI systems[628] and the generated output.[629] As emphasized in the *Proposal for AI Liability Directive*, establishing causality in such claims is challenging due to the "opacity of these systems and the large number of people involved in their design, development, deployment, and operation processes."[630] Although this thesis will not address copyright infringement, the legal recognition of the AI contribution would also provide a legal basis for other, future, discussions. This transparent identification would be illustrative for the claims to be made in these lawsuits, because determining whom to address for an infringement claim calls for identification of the rightsholder. Otherwise, the authorial causation required by copyright law cannot be established between AI-generated works and the natural persons. Giving protection to each individual to the extent of their creative contribution prevents the possibility of hiding behind a machine learning model or black-box paradigm in a future infringement dispute.

Third, unlike authorship, neighbouring rights are regimes without the prerequisite for the first right holder to be a natural person[631] and impose no examination of originality[632] as they contain no provision for authorial causation between the work and the creator of the subject matter to which neighbouring rights protection is granted. Some scholars, however, have criticized the absence of a *de jure* threshold for these protections.[633] Hugenholtz has emphasized

[628] See e.g. an image search tool to detect whether a work has been used as a part of a dataset to train AI Benj Edwards, "Have AI image generators assimilated your art? New tool lets you check | Ars Technica", (16 September 2022), online: *Ars Technica* <arstechnica.com/information-technology/2022/09/have-ai-image-generators-assimilated-your-art-new-tool-lets-you-check/> [perma.cc/WAA9-FFUS].
[629] See Schafer, Komuves, Zatarain and Diver arguing that compliance with copyright law should be established as the fourth law of robotics in addition to Asimov's rules Schafer et al, "A fourth law of robotics?", *supra* note 428 at 219. See also *Amel Chamandy / Galerie NuEdge Fine Arts v. Adam Basanta*, 500-17-104564-185.
[630] *Proposal for AI Liability Directive*, *supra* note 8 recitals 3 and 17.
[631] Goldstein & Hugenholtz, *supra* note 116 at 230.
[632] Hartmann et al, *supra* note 9 at 88.
[633] Hugenholtz, *supra* note 351 at 1009.

the legal uncertainty created by this absence.[634] Neighbouring rights are generally granted as an incentive to the human resources and financial investment, rather than the creativity, provided.

Although the prodigious contributions of current AI technologies include creative examples across copyright law, the human creativity required to produce each output decreases to the vanishing point for each creative process.[635] Protection is needed as long as a natural person contributes to the creative process. In order to notice the absence her creativity, however, the copyright system could also monitor its decrease. The current European copyright system is not able to recognize the difference between a 100% human-generated work and work generated with the contribution of an AI. The distinction should be made objectively, and protection should be granted by a fair copyright system that ensures the necessary transparency.

To put it another way, focusing on substantial investment as a protection threshold in a context where human creativity prominently decreases might be a stable and long-term solution. Due to the AI system's autonomy and opacity, it gets more challenging to trace the effects of human contribution, thus the authorial causation, to the AI output. A process capable of producing millions of outputs that can be reduced to a single click clearly needs to be rewarded according to the resources provided rather than the creativity. Today, a significant amount of money and human labour are invested in this type of technology, and even daily usages are subject to fees through various license agreements. In addition, the organizational investment rewarded by the recently adopted press publisher's neighbouring right could be exemplary for AI-generated works.

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[634] *Ibid*.

[635] Cf. Remy Chavannes, "Auteursrecht | Tijdschrift voor auteurs, media- & informatierecht", online: *Auteursrecht* <www.auteursrecht-online.nl/>; Daniel J Gervais PhD, "The Machine as Author" (2020) 105:5 Iowa Law Review 2053–2106, 14-15, cited in Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9 at 22.

Neighbouring right protection is, in fact, a reward-based expenditure mechanism. Indeed, rights have been granted to performing artists because of their necessary creative intervention in giving life to existing works.[636] The producers of sound recordings obtained their rights on the basis of their creative, financial, and organizational resources.[637] Similarly, broadcasters were provided with these rights on the basis that they made the works available to the public.[638] Press publishers' newly introduced novel rights reward the organizational and financial investment made to produce press publications.[639]

Ramalho, however, has addressed the difficulty of enforcing the substantial investment threshold of *sui generis* protection on databases.[640] In terms of AI-generated works, there may be so many persons involved in the creative process, that a criterion to facilitate the choice among them would not only introduce more legal certainty but prevent overprotection, or the emergence of an unenforceable regime requiring the consent of several persons.

Since too many persons are involved in this process, in addition, identification of certain people can facilitate the granting of protection. Many authors have come up with suggestions for these right holders, including programmers, data suppliers, trainers, feedback suppliers, users, owners, financial investors of the AI system, government and machine, itself.[641] In this context, it would not be easy to define the roles of these persons and entities individually. It can be stated, however, that programmers, dataset curators, trainers, feedback suppliers and users could well benefit from this protection as the contribution of each is indispensable to the production of the work. It should be noted, however, that these contributions can also vary for each AI system in

[636] *Understanding copyright and neighbouring rights*, second edition ed (Geneva, Switzerland: WIPO, 2016) at 28.
[637] *Ibid*.
[638] *Ibid*.
[639] Scalzini, "The New Neighbouring right for Press Publishers", *supra* note 359 at 108.
[640] Ramalho, *supra* note 9 at 63.
[641] Sturm et al, "Artificial Intelligence and Music", *supra* note 9 at 4; Deltorn & Macrez, *supra* note 9 at 6; Yanisky-Ravid, *supra* note 9 at 692; Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9 at 14.

each case. At this point, 'necessity' should be assessed in terms of steps of the creative process that enabled generation of the work, not in terms of its financial support. As with audiovisual works, these identified persons could register the work. This type of registration system would not prevent parties from consolidating all rights within a single person through other contracts. Initially, however, all creative contributors would be granted the right, to ensure the equity of subsequent contractual relationships. Otherwise, the rights of all parties, including authorship, would be stipulated without discussion, by a contract determined by a tech company, as is the situation today.

Finally, as there exists no authorial causation between the right holder and the neighbouring rights, the protection terms in this context are not associated with the right holder's lifetime. The protection term of each neighbouring right is independently determined by the EU legislator for varied *ratio legis*. For instance, the recent right of press publishers lasts just two years after publication.[642] In a regime for AI-generated works, with countless examples and possible rights holders, the protection period may be shorter than a natural person's life span.

For these reasons and the recommendations mentioned, a collective neighbouring right regime for AI-generated works should be introduced under Union law. A new neighbouring right regime could be created with a directive that would also be enacted in copyright law. Although the Trends and Developments in Artificial Intelligence report stated that a market failure needs to be demonstrated to justify establishment of such a regime, its mention at all shows that the EU legislator has not substantively rejected this regime.[643] The development of AI technologies and

[642] *Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and neighbouring rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC (Text with EEA relevance.)*, *supra* note 191 art 15(3).
[643] Hartmann et al, *supra* note 9 at 95. See also Reto Hilty, Jörg Hoffmann & Stefan Scheuerer, *Intellectual Property Justification for Artificial Intelligence* (Rochester, NY, 2020) at 15 (Outlining the context-dependency of market failure regarding AI outputs as opposed to not identifying market failure regarding AI tools); Philipp Hacker, "Immaterialgüterrechtlicher Schutz von KI-Trainingsdaten" (2020) GRUR 1025 at 1033 (considering market failure

the preparation of such a report, in fact, demonstrate its necessity. It cannot, therefore, be said that a neighbouring right regime for AI-generated works is against the will of the EU legislator.

4.3 Conclusion

On the basis of the information provided in the first three chapters, this chapter sought the most appropriate solution for AI-generated works under European Union law. In this context, the granting of an electronic personality to AI systems, contractual protection, the fall of these works into the public domain, assumption of a fictional link between a person and the work, establishment of analogies with the derivative work and the work-made-for-hire doctrines, and introduction of a new neighbouring right regime have all been considered.

The first solution, creation of a digital personality, was an option that EU legislators had previously considered and rejected. Such legal reform also exceeds the limits of this thesis and of copyright law. A comprehensive amendment to the legal system of this kind would also require extensive empirical analysis. Similarly, given the diversity of existing AI systems, the choice of those to be granted personality is a policy problem requiring detailed analysis. It would be most efficacious for the legislator not to prefer an over-inclusive regime that covers all of these systems. For this personality to perform its rights and obligations, it would be necessary to establish a connection with certain natural persons. Considering the number of persons among whom the choice would need to be made, however, an over-inclusive structure would make

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possible regarding training data); Dornis, "Der Schutz künstlicher Kreativität im Immaterialgüterrecht" (n 80) 1264 (assuming an economic need for protection); briefly, all authors acknowledge the lack of clear empirical evidence, where the whole market failure standard ultimately comes down to an allocation of the burden of proof or burden of justification, with the option of either the status quo or the freedom principle as a starting point", cited in Stefan Scheuerer, "Artificial Intelligence and Unfair Competition – Unveiling an Underestimated Building Block of the AI Regulation Landscape" (2021) 70:9 GRUR Int 834–845 at 842.

enforcement challenging. There is, therefore, currently no need for this type of fundamental amendment to the legal system as a whole for a problem emerging from IP law. This option fails, in sum, to comply with the principle of proportionality under EU copyright law.

Second, contract law was discussed as an option that would be available in any case. Even if AI-generated works were uncopyrightable, they would be subject to contractual relations, and through these, determination of a right holder. This area, where contractual freedom dominates, would serve as the most suitable regime for AI-generated works in all cases: the parties would have the opportunity to shape the regime as they wished and to create the most appropriate model of protection. Currently however, the power and information imbalance characterizing the tech industry, the lack of knowledge about such a rapidly developing field, and the disproportionate diffusion of material resources, mean that these technologies require harmonized provisions, and through these, establishment of an equitable legal framework.

Third, also considered were the implications of the fall of AI-generated works into the public domain. This option is tightly related to the rationales of copyright law and determines whether the works are subject to protection in the copyright system. Since an authorial connection is not established in law between AI-generated works and a natural person, their fall into the public domain could be the most workable solution. This thesis however prefers an enforceable proposal. In addition, the slightest human contribution that could be present in the generation of these works needs to be encouraged. In sum, the argument was made here for a protection regime in copyright law, and the following four models of protection were discussed.

The fourth was assumption of a fictional link between a natural person and a work in parallel with Section (9)3 of the *Copyright, Designs and Patents Act 1988*. This option was rejected because current uncertainties in the provision have delayed its implementation. This

would be a challenge, in any case, given the current complex structure and advancement of AI technologies.

Fifth, the extension of the derivative works doctrine was argued to cover AI-generated works. However, since this doctrine does not have a harmonized definition in Union law and the definition generally accepted in copyright systems is incompatible with the structure of AI systems, this proposal was also rejected.

Subsequently, the work-made-for-hire doctrine, was discussed, and an attempt was made to establish an analogy with AI-generated works. This option was also rejected because its primary shortcomings would also hinder its implementation, i.e., that AI systems do not possess a legal personality or will. In the eyes of a legal system, natural persons and AI systems are too different for such an analogy to be made. If it could be made, indeed, all existing copyright law mechanisms could be applied.

Finally addressed was neighbouring rights protection, which is frequently employed in EU law. An authorless *sui generis* protection regime could also be created for AI-generated works, as its types are shaped according to needs in Union law. In addition, the EU legislator's consideration of the possibility in a number of documents shows its compliance with her will and the system’s entirety.

As a result, this thesis proposes an authorless protection of AI-generated works with a registration system under Union law. This system could encompass all of the persons creatively contributing to the output, including the programmer, dataset provider, trainer, feedback provider and user behind the AI system, who would have a neighbouring right to the AI-generated work. In this context, a registration system and contract law would provide the mechanisms that facilitate enforcement of this right. AI-generated works would thus be protected by an authorless neighbouring rights regime supported by contract law.

5 Conclusion

This thesis sought to discuss whether and how AI-generated works should be protected in the framework of European Union copyright law. The employment and the visibility of AI technologies have lately increased in the creative industries and, thus, in this field of law. In the culture, media, and entertainment industries, the line between works made by human beings and those made with AI contribution started to blur. In fact, an AI-generated painting produced with a text-to-image system during the final stages of this thesis won an annual art competition.[644] Many criticized the award's acceptance of the use of AI; many criticized the granting, to the image, of the award.[645] However, the author did not violate the rules of the competition.[646]

Copyright law, a desert-based system, aims to reward creative effort in a variety of forms. However, it also has a consistent set of rationales, rules, and mechanisms. This thesis thus sets out specifically to investigate whether AI-generated works could be integrated into the European Union copyright system while complying with its rules and preserving its coherent integrity.

Since the 1950s, the creative industries have used AI technologies to create a multitude of works.[647] These works have been part of copyright systems without being explicitly termed 'AI-generated'. The present state of the art integrates works created by this means in a number of ways.[648] In 2019, WIPO's Trends Report revealed a number of regimes in various copyright systems covered by this thesis.[649] In addition, the IP courts and offices in a number of

[644] Roose, *supra* note 614.
[645] *Ibid*.
[646] *Ibid*.
[647] Amy X. Wang, *supra* note 474.
[648] See e.g. *Copyright, Designs and Patents Act 1988* (UK), s 9(3); *supra* note 34; Sukanya Sarkar, *supra* note 4; Beijing Internet Court Civil Judgment, Beijing, 2018, *Feilin v. Baidu*, (2018) Jing 0491 MinChu No. 239 and Guangdong Shenzhen Nanshan District People's Court Civil Judgment, 2019, *Tencent Shenzhen v. Shanghai Yingxin*, (2019) Yue 0305 MinChu No. 1401.
[649] *WIPO Technology Trends 2019 – Artificial Intelligence*, WIPO Technology Trends (Geneva, Switzerland: World Intellectual Property Organization (WIPO), 2019).

jurisdictions have taken other positions in varying cases on the intersection of AI-generated works and copyright law.

First, the Beijing and Shenzhen Courts explicitly labelled two works as 'AI-generated' in China.[650] Although decisions like these would not make a difference to the enforcement of rights granted under this title, identification of the works is a crucial step. The impact of this approach can be seen in the solution recommended here to the research question posed above.

Second, in the *Amel Chamandy / Galerie NuEdge Fine Arts v. Adam Basanta* case, the Québec Court discussed whether the randomly generated output of an AI system that reproduced an existing work could constitute a copyright infringement.[651] Although this case is pending, even the litigation process has sparked many questions about authorship and liability.

Recently, a natural person and a drawing application have been registered as co-authors of an AI-generated work by the Indian Copyright Office,[652] and the CIPO.[653] These registrations have not currently caused an enforcement dispute in the copyright system and do, at least however, underline the AI-generated feature of the works. While this approach has been influential in terms of the thinking that led to the outcome adopted here, the idea of granting a title to AI systems has not been recommended for now.

In reaction to these developments, a substantial number of works have been written on AI and its relevance to copyright law.[654] The EU legislator has also indirectly addressed the issue: in recent years, its Parliament and Council published two proposals to regulate AI technologies and

[650] Beijing Internet Court Civil Judgment, Beijing, 2018, *Feilin v. Baidu*, (2018) Jing 0491 MinChu No. 239 and Guangdong Shenzhen Nanshan District People's Court Civil Judgment, 2019, *Tencent Shenzhen v. Shanghai Yingxin*, (2019) Yue 0305 MinChu No. 1401.
[651] *Amel Chamandy / Galerie NuEdge Fine Arts v. Adam Basanta,* 500-17-104564-185 (decision pending).
[652] Sukanya Sarkar, *supra* note 4.
[653] *Supra* note 37.
[654] *Supra* note 9.

adapt their civil liability regimes.[655] This thesis was thus able to take into account the most up-to-date but not the final, view of the EU legislator on the issue.

This thesis began with an introduction framing its research question and background. Chapter Two provided an overview of AI in order to allow the reader to contextualize the research question. As AI technology is described as "a comprehensive set of sciences, theories, and techniques,"[656] the chapter narrowed the focus to the systems' opacity and autonomy and then centered on the epitome of these features: machine learning models. The first section then introduced the legal definition of the term 'Artificial Intelligence' adopted for purposes of this research: 'techniques and approaches, listed in Annex I of the *Proposal for AI Act*, that aim to reproduce the cognitive abilities of a human being.' After second section explained the aim and operation of machine learning models, the third section then distinguished between, AI-assisted, and AI-generated, works. The third section defined 'AI-generated work' for purposes of this thesis as that created by breaking the causal link with any human being in the creative process, as a consequence of the autonomy of the AI system. The fourth section exemplified these technical details by listing several contemporaneous and sensational AI models and some of the works they've created. Chapter Two thus demonstrated the areas of common usage served by AI systems and the wide relevance of the research question to the daily lives of ordinary people. The final section provided examples of similar generative artworks, illustrating how the causal link between author and output can be interrupted as the definition of AI-generated works adopted in this thesis suggests.

Chapter Three addressed the fundamental structure of European Union copyright law by outlining the elements that cannot accommodate AI-generated works. It first presented the three

[655] *Proposal for Artificial Intelligence Act*, *supra* note 8; *Proposal for AI Liability Directive*, *supra* note 8.
[656] Council of Europe, *supra* note 28.

most prominent theories underlying EU copyright law, and then discussed the concept of authorship, another cornerstone of the research question posed here. The chapter then illustrated how this system, which defines the originality of the work as "the stamp of the author's personal touch,"[657] can also grant protection to anonymous works. It demonstrated the ways in which EU law places the human creator of an artwork at copyright system's center, by connecting moral rights to the author's personality and linking the duration of protection to the span of the author's life. It then referenced the idea-expression dichotomy, a fundamental distinction in many copyright law systems, and originality, as the systems' primary criterion of protection. The chapter then outlined neighbouring rights, where the personal relationship between the rights holder and her work is weaker than it would be under authorship. It concluded with a brief review of the recent Proposals that revealed the EU legislator's current thinking on AI. The chapter thus summarized the elements of the legal system upon which the solution arrived at here for protection of AI-generated content was based.

While the first three chapters expanded on the research question, Chapter Four developed the options and arguments for a solution to protection of AI-generated works. As a collection of practical options currently applied in a number of contexts, Chapter Four comprises the latest and primary recommendations of scholars in the field for the dilemma posed by prodigious AI production of creative work. The chapter initially outlined solutions outside the realm of EU copyright law. These were (i) the granting of electronical personality to AI systems, and (ii) the protection of AI works within the scope of contract law. It then outlined a solution framing copyright law: (iii) the fall of these works into the public domain; and the solution to which many jurisdictions have resorted within the scope of copyright law, i.e., (iv) establishment of a fictional link between the person behind the AI system and the work. One of the exceptional provisions

[657] *Painer*, *supra* note 33 at paras 90-93. *Football Dataco*, *supra* note 33 at paras 38-39.

relevant to EU law before Brexit, Section (9)3 of the UK's *Copyright, Designs and Patents Act 1988*,[658] was addressed in this context. Finally, the chapter addressed other three solutions within the scope of copyright law: (v) extension of the derivative works doctrine; (vi) analogy to the work-made-for-hire doctrine; and (vii) neighbouring rights protection. Although various solutions from a number of jurisdictions have been proposed, their compatibility with the EU system affect their adoption here as proposed solutions.

The first solution, granting of an electronical personality, was an option that EU legislators had previously considered and rejected. It is obvious that such a legal reform exceeds the limits of this thesis and copyright law, as it fails to comply with the fundamental principles of EU copyright law: subsidiarity and proportionality. Such a comprehensive amendment to the legal system would also require extensive empirical analysis.[659] In addition, given the diversity of existing AI systems, the choice of systems to be granted personality is a policy problem requiring detailed analysis. The legislator should, and would, not prefer an over-inclusive regulation covering all of them. For this personality to perform its rights and obligations, it would also be necessary to establish its connection with designated natural persons. The choice of these, however, should not lead to creation of an over-inclusive structure that would make enforcement challenging. In brief, this option is considered to be a speculative and inefficacious solution to the research question addressed here.

Second, contract law was addressed as an option that would be available in any case. This area of law, where contractual freedom dominates, can provide parties with the opportunity to shape the regime as they wish, and to create one optimal for each group of people behind AI-generated work through tailor-made contracts. Due to the current power and information

[658] See *Copyright, Designs and Patents Act 1988* (UK), s 9(3) *supra* note 34.
[659] Hartmann et al, *supra* note 9 at 5.

imbalances governing the tech industry, the lack of public knowledge of such a rapidly developing field, and the disproportionate diffusion of material resources, however, these technologies initially require central and supranational regulations to establish equitable legal framework for stakeholders.

Third, the possibility of having AI-generated works simply fall into the public domain was discussed. This option is also tightly related to the rationales of copyright law and determines whether these works are subject to protection in the copyright system. Since an authorial connection is unlikely to be established between AI-generated works and a natural person, having them fall into the public domain might be a first-level solution. The problem with this situation, however, is that because traditional authorship is more advantageous than a public domain work regime, people would not have been disclosing AI contribution. A solution that is practically applicable, that is to say, enforceable by the right holders and adoptable by the 27 Member States, is preferable within the terms of this thesis. In addition, the slightest human creativity that may be present in the generation of AI-generated works needs to be encouraged. This section therefore argued that a protection regime should be introduced into copyright law and the sections following discussed the merits of four available models.

Fourth, a European version of Section (9)3 of the *UK Copyright, Designs and Patents Act 1988*, which seems to envisage a fictional link between the human controlling the computer and the output, was suggested. Such an explicit and specific provision is a first for AI-generated works. Given the complex structure of current AI technologies and the diversity of those who control them, however, the ambiguity of its preferred terminology hurdles its application.

Fifth, the protection of AI-generated works as derivative works of the generative algorithm was discussed, but this option had the same fate as the previous: since the connection between AI-generated work and the algorithm does not fall under the scope of the derivative

work doctrine, it cannot be directly applied. Additionally, the introduction of a new and expanded scope is unlikely be expected in the absence of a harmonized definition of these works, so this option is incompatible with EU law's structure.

Sixth, another copyright law doctrine, work-made-for-hire, was discussed, and an attempt was made to make an analogy between the AI system and the agents considered by the doctrine. It was concluded, however, that the primary shortcomings in the analogous relationship, i.e., the absence of the AI system's legal personality, would hinder implementation of the doctrine. It seems that a natural person and an AI system are too different from a legal perspective for an analogy to be properly made. If such an analogy could be established, indeed, all existing copyright law mechanisms including this doctrine would be applied to AI systems and their works.

The final model considered was the neighbouring rights regime, which is frequently and diversly applied in EU law. This option was deemed appropriate for AI-generated works as it contains neither an originality threshold connecting them to a natural person nor a system that centers on the right holder, as tightly as does authorship. A *sui generis* neighbouring rights regime can also be created for AI-generated works, as their types are shaped in Union law according to their needs. In addition, the EU legislator's explicit consideration of this possibility in a number of documents[660] shows their compliance with its will and the system's integrity.

Chapter Five, here, will conclude with a discussion and illustration of the ways in which neighbouring rights might provide flexible and tailor-made protection for AI-generated works.

As a result, Chapter Five proposes an authorless protection of AI-generated works with a registration system under Union law. A *sui generis* authorless protection and a neighbouring right regime can be introduced for them through an analogy with anonymous works. This regime

[660] *Ibid*.

would not require a direct connection with a creator who must be a natural person, as authorship and term of protection do. In a vertical legal text such as the *Computer Programs* or *Databases Directives* — other novel or relatively controversial categories of works — a novel neighbouring rights regime can be introduced. As previously done, EU legislators could publish a Directive providing a protection regime for AI-generated works as a specific type of work. This choice of instrument would provide both "flexibilities to the Member States without friction in their national regimes and the harmonisation and legal certainty desired by the EU."[661] The scope of this Directive would allow the Union law to stipulate the AI-generated works' definition, protection regime and term, and the rights to be granted. Under the principle of proportionality, the content of a neighbouring right should neither be broad enough to directly coincide with copyright protection nor be narrow enough to make enforcement impossible.[662]

A registration system is also suggested where people who contribute to the creative process, including the programmer, dataset provider, trainer, and user behind the AI system, could be recorded and identified. These people would thus have a collaborative neighbouring right to the AI-generated work. In this context, contract law would still provide mechanisms to facilitate the enforcement of the right. AI-generated work would thus be protected by an authorless neighbouring rights regime supported by contract law.

The disclosure requirements, as the *Proposal for AI Act* did, to be introduced under copyright law can objectively determine each stakeholder's role. In this way, the European copyright system would provide these individuals with proportionate and enforceable protection, rather than the recognition of any of the humans involved in the creative process as the author.[663]

[661] *Proposal for AI Liability Directive*, *supra* note 8 at 7.
[662] See for a discussion on appropriate scope of protection Senftleben & Buijtelaar, "Robot Creativity", *supra* note 9 at 18.
[663] Ginsburg & Luke Ali Budiardjo, *supra* note 9 at 404.

Through this proposed registration system, one of the various rights holders could register the AI-generated work in a national registration system, such as the ones available in several jurisdictions for audiovisual works.[664] During registration, stakeholders who perform specific roles would need to be identified. In this context, a number of individuals or single person could be identified as the programmer, dataset provider, trainer, and user. However, since this registration would be public, other people could claim their titles later by proving their proper contribution. Their contribution could be assessed through an objective threshold such as substantial or organizational investment.[665]

In terms of term of protection, shorter periods could be preferred, as in other neighbouring rights regimes, so that the capacity of AI technology for mass production could be accommodated in the copyright system. Finally, a 'use it or lose it' requirement like the one proposed for phonogram producers[666] could be introduced. The registration system as a whole, and this obligation, would serve to establish the registrants' continuing intent to protect the AI-generated work.

The proper functioning of such a system could not be ensured by legal rules alone. In this context, with a discriminative AI system, it could be ensured that everyone was able to control whether or not a work was registered. Other rights holders would be able to detect registrations that were carried out without their knowledge. This solution is not detailed here, as it is a technical, rather than a legal, fix.

An executable regime would need to be put forward for all possible right holders, particularly in a creative process such as this, where a large number of people are involved. Even

[664] See e.g. registration mechanisms in Italy, Spain and France Kamina, *supra* note 353 at 85.
[665] But see Lauber-Rönsberg & Hetmank, "The concept of authorship and inventorship under pressure", *supra* note 371.
[666] *Supra* note 344.

if each of these were different, and in different jurisdictions, establishing such a system would enable them to initiate other legal relations, including subsequent contracts, from a more equitable position. However, these people would retain the right to shape the regime as they wished, by concluding agreements with each other. The purpose here would be to ensure that none of the stakeholders is left behind and to ensure fairness in the system. In addition, public knowledge that a work is 'AI-generated' would also provide the necessary transparency in the system.

In practice, the s*ui generis* neighbouring right regime and registration system proposed here could resemble many neighbouring rights, as well as protection for anonymous, and audiovisual, works. This resemblance would, in fact, ensure the smooth operation of the protection regime for all beneficiaries, as intended. Although copyright infringement related to AI-generated works is not directly addressed here, the proposed regime would be determinant for future conflicts. For example, registered individuals would be acknowledged as potential beneficiaries of the alleviations of the burden of proof by the newly published *Proposal for AI Liability Directive*,[667] or the copyright exceptions on, e.g., text and data mining, introduced in the *CDSM Directive*.[668] The most important first step, however, is to overtly define the works as AI-generated and proportionately integrate them into the European Union copyright law system.

[667] *Proposal for AI Liability Directive*, *supra* note 8 art 4.
[668] *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.)*, *supra* note 191 art 3.

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