Can Output Produced Autonomously by AI Systems Enjoy Copyright Protection, and Should It? An Analysis of the Current Legal Position and the Search for the Way Forward

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The debate as to whether output produced autonomously by Artificial Intelligence (A.I.) systems can, and should, benefit from copyright protection is evolving from a topic of largely theoretical discussion to a question with which courts and legislators can no longer avoid grappling.

In the European Union (EU), the European Parliament has recognized the need to improve legal certainty in this area – but action to deliver this has not been forthcoming. In the United Kingdom (UK), the Intellectual Property Office's review of the regime that affords protection to computer-generated works has concluded that the relevant laws should be left unchanged, because any change would cause uncertainty. That reasoning may raise eyebrows given that the reason for undertaking the review in the first place was because the existing law is unclear. In the United States (U.S.), the Copyright Office is facing a legal challenge to its decision to refuse copyright protection to an artwork the applicant claims his AI machine produced autonomously. It is clear that law makers need to do more to meet the challenges that AI autonomous creation is posing to copyright law and the principles that underpin it.

This Article analyses the current state of AI creativity and how this interacts with both existing law and the doctrinal foundations of copyright in each of the EU, UK and U.S. It examines how a way forward might be found that balances the competing concerns at play, calling for serious action to tackle the need for reform.

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Introduction

AI systems are proving capable of producing a range of artistic works that are increasingly difficult to distinguish from those created by human beings, from paintings to newspaper articles.[1] It has even been suggested that AI systems

1. According to some predictions, AI will create a "Top 40" pop song by 2027-2028 and write a New York Times bestseller by 2049, as reported by Stefan Brambilla Hall, *AI Will Write a Best-Seller By 2049, Experts Predict*, World Econ. F. (Mar. 1, 2018), https://www.weforum.org/agenda/2018/03/timeline-of-creative-ai/ [https://perma.cc/MQD8-6FNK]; *see also* Jane Ginsburg, *People Not Machines: Authorship and What It Means in the Berne Convention*, 49 Int'l Rev. Intell. Prop. & Competition L. 131, 133 (2018); Yong Wan & Hongxugang Lu, *Copyright Protection for AI-generated Outputs: The Experience from China*, 42 Comput. L. & Sec. Rev. (2021); Christie's, *Is Artificial Intelligence Set to Become Art's Next Medium* (Dec. 12, 2018), https://www.christies.com/features/A-collaboration-between-two-artists-one-human-one-a-machine-9332-1.aspx [https://perma.cc/9EYW-28CB]; Dom Galeon, *The World's First Album Composed and Produced by an AI Has Been Unveiled*, Futurism (Aug. 21, 2017), https://futurism.com/the-worlds-first-album-composed-and-produced-by-an-ai-%20has-been-unveiled [https://perma.cc/AN22-UTSE]; Lauren Goode, *AI Made a Movie and the Results Are*

are likely to soon "take center stage in the creative process, becoming the main drivers of creativity and innovation."[2] This is not only challenging long-standing understandings of human creativity and art but has caused "one of the most complicated and universal debates in modern copyright law."[3] This is the debate as to whether copyright law and the theories that underpin it can, and should, protect output autonomously generated by AI systems.[4]

Prevailing doctrine in most jurisdictions suggests that creations autonomously generated by AI cannot benefit from protection due to the lack of a human author, ultimately sending such creations "straight into the public domain."[5] Even in jurisdictions with provisions for computer-generated works, it is not clear how these work in the case of fully autonomous AI-systems.[6] The legal uncertainty this causes undermines the efforts of policymakers to unlock the full potential of AI.

Many jurisdictions have made efforts to encourage growth and innovation in the field of AI, and some have started to formulate frameworks to regulate this disruptive technology.[7] However, the lack of clear regulation or policy regarding the copyright protection of AI-generated output, and resulting legal uncertainty, is a clear gap in these efforts. Thus far, efforts to consider reform in this area have been lackluster. In 2017, the European Parliament requested that the European Commission elaborate on the criteria on which "works produced by computers or robots" could benefit from copyright protection.[8] In 2020, the European Parliament noted the importance of improving legal certainty in this area.[9] However, there has not yet been any move towards reform to create such certainty. In late 2021, the UK Intellectual Property Office (IPO)

Horrifyingly Amazing, Wired (June 11, 2018), https://www.wired.com/story/ai-filmmaker-zone-out/ [https://perma.cc/9SYQ-QKUK].

2. Kalin Hristov, *Artificial Intelligence and the Copyright Dilemma*, 57 IDEA 431, 434 (2016).

3. *See generally* Wan & Lu, *supra* note 1.

4. Jane Ginsburg & Aam Ricketson, International Copyright and Neighbouring Rights: Rhe Berne Convention and Beyond 721 (2nd ed. 2006).

5. Tim W. Dornis, *Of 'Authorless Works' and 'Inventions without Inventor' – The Muddy Waters of 'AI Autonomy' in Intellectual Property Doctrine*, Eur. Intell. Prop. Rev. 1, 2 (2021).

6. Andres Guadamuz, *Do Androids Dream of Electric Copyright? Comparative Analysis of Originality in Artificial Intelligence Generated Work*, 2 Intell. Prop. Q. (2017) (updated June 2020 version), https://ssrn.com/abstract=2981304 [https://perma.cc/C5VR-TZHF]; Jani McCutcheon, *Curing the Authorless Void: Protecting Computer Generated Works following Ice TV and Phone Directories*, 37 Melb. U. L. Rev. 46, 51 (2013); UK Intell. Prop. Off., *Impact Assessment: Consultation Stage Impact Assessment on Artificial Intelligence and Intellectual Property* (Oct. 29, 2021), https://assets.publishing.service.gov.uk/media/617bfda2d3bf7f55fc098f73/impact-assessment.pdf [https://perma.cc/DFU6-V3QU].

7. Future of Artificial Intelligence Act, H.R. 4625, 115th Cong. (2017); Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts, COM (2021) 206 final (Apr. 21, 2021); UK Government Department for Digital, Culture, Media and Sport, Establishing a Pro-innovation Approach to Regulating AI: An Overview of the UK's Emerging Approach (July 20, 2022).

8. European Parliament (Committee on Legal Affairs), Report with Recommendations to the Commission on Civil Law Rules on Robotics, at Explanatory Statement, Eur. Parl. Doc. (2015/2103(INL)) (Jan. 27, 2017).

9. European Parliament, Resolution of 20 October 2020 on Intellectual Property Rights for the Development of Artificial Intelligence Technologies, at para 6, Eur. Parl. Doc. 2020/2015(INI) (Oct. 20, 2020).

launched a consultation calling for views on whether the relevant British laws in this area should be changed.[10] The outcome was a finding that there is too much uncertainty about the impact that any change would have. Therefore, the conclusion was to maintain the status quo. The status quo, however, is also one full of uncertainty (which is what prompted the consultation to begin with). Such inaction on the part of lawmakers is an unsatisfactory approach and, as legal author Tim Dornis articulates, "problems are sure to emerge from the uncertainty of practitioners and courts, who, confronted with new and untested legal issues, are left to their own devices."[11]

This thesis will examine the current legal landscape and what it means for output produced autonomously by AI systems, with a focus on the law in the EU and UK. It will also examine the theories that are used to justify copyright law, and whether protecting or not protecting such output is consistent with their rationales. Finally, the most prominent solutions that have been proposed will be assessed.

I. Autonomously Generated AI creations

In certain contexts, AI systems can be viewed as tools being used by human beings to support or assist with their creative processes. In such cases, where a human being is involved in the output-producing process, it is largely straightforward to point to a human author responsible for creating the work. Therefore, it is possible to deal with such scenarios within the current legal landscape by applying the existing principles of copyright law.[12] Comparisons can be made to the use of a camera by a human photographer, as although the photographer uses the camera to create a photograph (and modern cameras use software to offer significant assistance in ensuring the best photograph is achieved), the photographs can still be recognized as the creative output of the photographer and the photographer owns the copyright in the photographs.[13] As author Jacopo Ciani puts it, "machine assistance does not disqualify the human agent from being deemed the author."[14] Indeed, the European Parliament has stressed the importance of distinguishing between AI-assisted human creations and creations autonomously generated by AI and has stated that where AI systems are used as a tool to assist an

10. UK Intell. Prop. Off., *Consultation Outcome: Artificial Intelligence and Intellectual Property: Copyright and Patents* (June 28, 2022), https://www.gov.uk/government/consultations/artificial-intelligence-and-ip-copyright-and-patents [https://perma.cc/5LHT-6T48].

11. Tim W. Dornis, *Artificial Creativity: Emergent Works and the Void in Current Copyright Doctrine*, 22 Yale J.L. & Tech. 1, 6 (2020), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3451480 [https://perma.cc/5LHT-6T49].

12. Andres Guadamuz, *Artificial Intelligence and Copyright*, WIPO Mag. (Oct. 2017), https://www.wipo.int/wipo_magazine/en/2017/05/article_0003.html [https://perma.cc/C4RC-G7XF].

13. *See* Case C-145/10, Eva-Maria Painer v. Standard Verlags GmbH et al., 2011 E.C.R. I-12533; *see also* Opinion of AG Trstenjak, para 121.

14. Jacopo Ciani, *Learning from Monkeys: Authorship Issues Arising From AI Technology, in* Progress in Artificial Intelligence 275, 276 (Moura et al. eds., 2019).

author in the creative process, the current framework for intellectual property rights remains applicable.[15]

However, we are now in a new era of creation in which increasingly intelligent programs are producing "advanced works that would normally be given copyright protection by the author" and we are being presented with "pieces that have emerged from the program, itself, and practically without human interaction."[16] It is this type of creation, rather than AI-assisted human creations that create "new regulatory challenges" in terms of intellectual property protection, as has been recognized by the European Parliament.[17] It is these creations and the challenges they pose that are the focus of this thesis.

As AI continues to develop and expand in capability it becomes increasingly necessary to have clarity on whether works created autonomously by AI systems can and should be protected by copyright - a question that "scholars and courts will need to answer soon."[18] Guadamuz argues that the latest AI systems are already more than mere tools used by humans to support human creative processes, as they already make "many of the decisions involved in the creative process without human intervention."[19] Ginsburg similarly recognizes that "the burgeoning of 'computer generated works'—outputs of digital neural networks that have 'taught themselves' to combine rules of literary, musical or artistic assembly after being 'trained' on a database of pre-existing works – suggests purely computer-generated works already exist or at least are in near prospect."[20]

The issues this poses for copyright law are not entirely new, given that, as Grubow notes, "legal scholars' consideration of authorship for compositions made by [AI] dates back to at least 1965."[21] However, the laws that are relevant for the copyright protection of AI-generated works still pre-date the now widespread use and pervasiveness of sophisticated AI systems. For example, the majority of EU copyright instruments, and the Berne Convention, are silent as to whether an "author" of a copyrighted work must be a natural or a legal person, which has resulted in debate as to whether an AI system can qualify as an "author", as examined further in section 5.3 below.[22] Ramalho captures

15. European Parliament, Resolution of 20 October 2020 on Intellectual Property Rights for the Development of Artificial Intelligence Technologies, at para 14, Eur. Parl. Doc. 2020/2015(INI) (Oct. 20, 2020).

16. Guadamuz, *supra* note 6; Bruce E. Boyden, *Emergent Works*, 39 Colum. J.L. & Arts 377, 378 (2016).

17. European Parliament, Resolution of 20 October 2020 on Intellectual Property Rights for the Development of Artificial Intelligence Technologies, at recital J, Eur. Parl. Doc. 2020/2015(INI) (Oct. 20, 2020).

18. Daniel J. Gervais, *The Machine as Author*, 105 Iowa L. Rev. 2053, 2057 (2020).

19. Guadamuz, *supra* note 12.

20. Ginsburg, *supra* note 1.

21. Jared Vasconcellos Grubow, *OK Computer: The Devolution of Human Creativity and Granting Musical Copyrights to Artificially Intelligent Joint Authors*, 40 Cardozo L. Rev. 387, 388 (2018).

22. Directive 2001/29, 2001 O.J. (L 167) 10; Directive 2019/790, 2019 O.J. (L 130) 92; Berne Convention for the Protection of Literary and Artistic Works, Sept. 9, 1886, as revised at Paris on July 24. 1971 (1161 U.N.T.S. 3) and amended in 1979 S. Treaty Doc. No. 99-27; WIPO Copyright Treaty, Dec. 20, 1996, S. Treaty Doc. No. 105-17 (1997); 2186 U.N.T.S. 121; 36 I.L.M. 65 (1997).

the full breadth of the challenge by pointing out that considering the role of AI within copyright law forces us not only to reconsider key concepts in copyright, including authorship and conditions for protection, but also "the dialectic between privatization and public domain, and the rationales underlying copyright protection in the first place."[23]

The European Parliament's Committee on Culture and Education has recognized that "trained AI systems can quasi-autonomously create and generate cultural and creative works, with only minimum human input."[24] The Committee also noted that AI systems can evolve unpredictably and create original works unknown even to those who initially programmed the system, which the Committee viewed as "a fact that should also be taken into account when establishing a framework for the protection of the exploitation rights derived from such works."[25] Therefore, although there is debate as to whether fully autonomous AI already exists or remains futuristic,[26] assessing the framework for intellectual property rights in light of the current state of AI and its continuing development is a priority for this area of law, and has been recognized as such by the European Parliament.[27] To try to find a solution to these challenges, it is useful to first consider how sophisticated AI systems produce output.

II. Overview of AI Systems and Their Output-Generating Processes

Firstly, it should be noted that there is no one universal, exhaustive and widely agreed upon definition of AI. Instead, an exact definition remains a subject of controversy among researchers, although it is often described as computer-based systems developed so as to mimic human behavior,[28] or "the cognitive functions that humans associate with their own intelligence."[29] Schalkoff defines it as "[a] field of study that seeks to explain and emulate

23. Ana Ramalho, *Will Robots Rule the (Artistic) World? A Proposed Model for the Legal Status of Creations by Artificial Intelligence Systems* 21 J. Internet L. 1, 2 (2017).

24. European Parliament, Opinion of the Committee on Culture and Education for the Committee on Legal Affairs on "Intellectual Property Rights for the Development of Artificial Intelligence Technologies," at 6, Eur. Parl. Doc. 2020/2015(INI) (Sept. 3, 2020).

25. *Id.*

26. Ana Ramalho, Intellectual Property Protection for AI-Generated Creations Europe, The United States, Australia and Japan 10 (2022); *see also* the recognition by the UK IPO that "[s]ome believe that AI will soon be inventing and creating things in ways that make it impossible to identify the human intellectual input in the final invention or work. Some feel this is happening now" in UK Intell. Prop. Off., *supra* note 10.

27. European Parliament (Committee on Legal Affairs), Report on "Intellectual Property Rights for the Development of Artificial Intelligence Technologies," at 13-22, Eur. Parl. Doc. 2020/2015(INI) (Oct. 2, 2020); European Parliament, Resolution of 20 October 2020 on Intellectual Property Rights for the Development of Artificial Intelligence Technologies, at recital E and paras 1 and 3, Eur. Parl. Doc. 2020/2015(INI) (Oct. 20, 2020).

28. Josef Drexl et al., *Technical Aspects of Artificial Intelligence: An Understanding from an Intellectual Property Law Perspective*, Research Group on the Regulation of the Digital Economy, Max Planck Inst. Innovation & Competition Rsch. Paper No. 19-30 1, 3 (2019) http://dx.doi.org/10.2139/ssrn.3465577 [http://perma.cc/LYZ8-TAZU].

29. Ugo Pagallo, Marcelo Corrales, Mark Fenwick & Nikolaus Forgò, *The Rise of Robotics & AI: Technological Advances & Normative Dilemmas*, *in* Robotics, AI and Rhe Future of Law 1, 5 (Marcelo Corrales, Mark Fenwick & Nikolaus Forgò eds. 2018).

intelligent behavior in terms of computational processes."[30] It has also been summarized as being "intelligence exhibited by machines."[31]

For the purposes of this examination, it is sufficient to say that although there is not a single widely accepted definition of AI, it is generally understood to be the "science of making computers do things that require intelligence when done by humans."[32] The most important characteristic of AI for this discussion is that it relates to computer programs which have a degree of independence or unpredictability, meaning that their "function and output are not exclusively determined by human creators."[33]

Understanding what is meant by "autonomous" AI systems is important in order to embark on an examination of how copyright law principles should apply to AI-generated output. In this analysis, the focus will be on the sophisticated types of AI that are more likely to be considered capable of autonomously producing output.

A. Machine Learning

Machine learning is currently the most commonly used sub-field of AI.[34] It has been defined as "the study of computer algorithms that allow computer programs to automatically improve through experience.[35] The process involves "teaching a computer program to identify patterns in data and to apply the knowledge to new data."

The machine learning process can be summarized, at a very high level, into the following three steps:

Step 1: The model architecture is programmed, meaning that the code for the AI system is written, mainly by human programmers.

Step 2: A training process based on a training algorithm and training data sets is used to develop a model. For example, the AI system may be provided with a large number of pictures of an animal, such as a cat, and from this can learn the features of a cat by detecting patterns and correlations, which then enables the AI system to recognize a picture of a cat the next time it is shown one, even if it has not seen that specific picture before.[36] As another example, an AI system can view many paintings by a particular artist and can learn to create a painting in the same style as that artist, as the Next Rembrandt project did.[37]

Step 3: The model developed in Step 2 is applied to new data to generate a certain output.[38]

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30. Robert J. Schalkoff, Artificial Intelligence: An Enigneering Approach, 2 (1990).
31. Ciani, *supra* note 14, at 275 (citing Pagallo, U., Intelligenza artificiale e diritto. Linee guida per un oculato intervento normativo. Sistemi Intelligenti, 3, 614, (2017)).
32. Jack B. Copeland, *What is Artificial Intelligence?*, Alanturing (May 2000), www.alanturing.net/turing_archive/pages/Reference%20Articles/What%20is%20AI.htm [https://perma.cc/T8PD-NFEJ].
33. Dornis, *supra* note 5, at 4.
34. Drexl et al., *supra* note 28, at 3.
35. Tom M. Mitchell, Machine Learning 1(1997).
36. Gervais, *supra* note 18, at 2057–58; Drexl et al., *supra* note 28, at 5.
37. *ING Presents The Next Rembrandt,* Next Rembrandt, https://www.nextrembrandt.com [https://perma.cc/7T6E-7HCQ] (last visited Oct. 13, 2022).
38. Drexl et al., *supra* note 28, at 4.

In Step 2 of the above process, the pictures initially shown to the AI system to train it might be labelled by humans with information about whether there is a cat in the picture before they are shown to the system.[39] This is known as supervised learning. Alternatively, programmers may use unsupervised learning. In unsupervised learning the system is not provided with labelled pictures, meaning that in our example, it is not provided with information about what a cat looks like. Instead, the AI system finds for itself what a cat looks like, for example by searching the web for pictures and identifying what those pictures have in common. Another technique is known as reinforced learning, in which the AI system makes decisions freely, and human beings confirm whether the decision made is good or bad.[40]

One method of machine learning that is particularly relevant regarding the challenges that AI poses to existing copyright law is a technique known as "deep learning." The deep learning technique "uses a layered structure of algorithms that allows the machine to learn and make decisions on its own."[41] Each layer in this structure deals with a particular task. The nature of deep learning means that it is automated and therefore, any human involvement in what is produced is at least one step removed from the person or people who programmed the AI code. This separation is what poses a challenge to the concept of authorship in copyright law. As Gervais asks, "Who is the author of the (unpredictable) outputs created by a (deep learning) AI machine?"[42] An issue also arises with regards to traceability and explainability, as the trial-and-error nature of the process means that it can be difficult to explain the final output if there is not access to the various iterations that led to it.[43]

B. Generative Adversarial Networks (GANs)

A specific type of deep learning model is known as "generative adversarial networks" (GANs), the emergence of which has led to "an explosion of AI-generated works."[44] This type of AI system poses particular challenges for copyright law. Indeed, it has been stated that GANs "can learn to mimic any distribution of data. That is, GANs can be taught to create worlds eerily similar to our own in any domain; images, music, speech, prose."[45] GANs refer to "the interplay between two models: a discriminative model and a generative one."[46] In short, the role of the discriminative model is to detect whether a given piece of data is part of the real dataset that the GAN has been provided with or not, whereas the role of the generative model is to produce output that imitates

39. *Id.* at 5.

40. Juan Pavón & María J. González- Espejo, *Fundamentals of Artificial Intelligence*, *in* An Introductory Guide to Artificial Intelligence for Legal Professionals 11–12 (María J. González-Espejo & Juan Pavón eds., 2020).

41. Gervais, *supra* note 18, at 2058.

42. *Id.* at 2059.

43. Pavón & González-Espejo, *supra* note 40, at 15.

44. Guadamuz, *supra* note 6.

45. Chris Nicholson, *A.I. Wiki: A Beginner's Guide to Generative Adversarial Networks (GANS)*, Pathmind, https://wiki.pathmind.com/generative-adversarial-network-gan [https://perma.cc/4Z3V-H6RN] (last visited Oct. 13, 2022).

46. Drexl et al., *supra* note 28, at 8.

that of a real dataset.[47] The authors of the model explain that "[t]he generative model can be thought of as analogous to a team of counterfeiters, trying to produce fake currency and use it without detection, while the discriminative model is analogous to the police, trying to detect the counterfeit currency."[48]

This can be described as an "actor-critic model" and one that is "'adversarial' because two machines work one against the other, creating a constant feedback loop that increases the quality of outputs."[49] GANs are usually provided with unlabeled data and therefore "any underlying structure is not evident to humans and/or cannot be easily discovered by other techniques."[50] A GAN network was used to create the artwork known as The Portrait of Edmond Belamy which sold for $435,000 at an auction at Christie's.[51]

As the above summary of these types of AI systems illustrates, there are already sophisticated types of AI systems in existence that arguably can operate independently from human beings. The greater the degree of autonomy a system has, the more difficult it is to find copyright protection for its outputs under current legal frameworks. If, for example, the output produced in Step 3 of the summary above is a pop song, which has been created by the AI system that has used a huge database of existing pop songs so as to "find correlations among the various songs and identify the elements. . .that may cause a song to be popular," then Gervais proposes that it is a fiction to consider a human author as being responsible for, or owning the rights in, the output, given that the AI system has used its own insights to create it.[52] Therefore, "[e]ven if the human programmer is considered the machine's master because she can switch it off or alter its code, is the master truly the author of the pupil's creation?"[53] Indeed, under both EU and U.S. law, once an AI system is fully autonomous, it seems impossible to consider a human being to be the author of its output or for such output to benefit from copyright protection, as discussed further in section 5 below.

This raises further questions as to whether the current law and our understanding of concepts such as authorship remain appropriate in face of such developments. We must consider reframing the legal and regulatory landscape to keep pace with, and not stand in the way of, technological developments. Answering this first requires an examination of the theories that justify copyright law.[54]

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47. *Id.*

48. Ian J. Goodfellow et al., Generative Adversarial Nets, 2 Proceedings of the 27th International Conference on Neural Information Processing Systems (NIPS'14) 2672, 2672 (2014).

49. Gervais, *supra* note 18, at 2057.

50. Ramalho *supra* note 26; Pavón & González- Espejo, *supra* note 40, at 13.

51. Charlotte Jee, *A Controversial Artwork Created by AI has Hauled in $435,000 at Auction,* MIT Tech. Rev. (Oct. 26, 2018), https://www.technologyreview.com/2018/10/26/139292/a-controversial-artwork-created-by-ai-has-hauled-in-435000-at-auction/ [https://perma.cc/Gs2A-5FJQ].

52. Gervais, *supra* note 18, at 2059.

53. *Id.*

54. Rosa Maria Ballardini, Kan He & Teemu Roos, *AI-Generated Content: Authorship and Inventorship in the Age of Artificial Intelligence, in* Online Distribution of Content in the EU 117, 120 (Taina Pihlajarinne, Juha Vesala and Olli Honkkila, eds., 2019).

III. The Philosophical Theories That Justify Copyright Law

As Ramalho puts it, "[b]y analysing the justifications for copyright protection in the first place, a conclusion on whether new subjects and/or subject-matter should come under copyright protection becomes more grounded."[55] In considering the rationales for copyright law, we can identify two prevalent schools of thought - one which bases the justification of copyright protection on natural rights (using either the labor theory or the personality theory) and one which justifies it based on utilitarianism.[56]

A. Natural Rights Theories

The argument that copyright protection is justified on the basis of natural, or moral rights starts from the premise that copyright is a natural right, and so laws do not create the right, but simply recognize that it exists. This starting point gives rise to two major theories, known as the labor theory and the personality theory.[57]

1. Labor Theory

It has been said that "[p]rehaps the most powerful intuition supporting property rights is that people are entitled to the fruits of their labour."[58] This labor theory—formulated by British philosopher, John Locke, in the 17th century—posits that the intellectual labor performed by an author mixed with other resources held in common (i.e. which are either owned by all or not owned by anyone) gives rise to a right of the author over the fruit of such labor, so long as there remains enough left in common for others.[59] This is because each person has a natural right of property in their own person and body, and so the labor of their body and the work of their hands, are theirs.[60] For copyright law, this, broadly speaking, equates to the idea that if a person's intellectual labor results in an intellectual good, then that person is entitled to a proprietary right in that good. Ramalho stresses that under this theory, creative expressions are protected as they are the result of intellectual labor, even if the underlying idea is not, and also points to this being expressed in "case law from several jurisdictions that determine that is the mind behind the human process, not the executant, that ultimately is deserving of authorship status."[61] This is important in that it recognizes the human mind as a vital element of authorship.[62]

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55. Ramalho, *supra* note 23, at 14.
56. *Id.* at 2; Ana Ramalho, The Competence of the European Union in Copyright Lawmaking 3 (2016).
57. Ramalho, *supra* note 26, at 21.
58. Edwin C. Hettinger, *Justifying Intellectual Property,* 18 Phil. & Pub. Aff. 31, 37 (1989).
59. Ballardini, He & Roos, *supra* note 54, at 121; *see generally* John Locke, Second Treatise of Government (Peter Laslett ed., 3rd ed, 1963).
60. Locke, *supra* note 59; *see generally* Simon Stokes, Art and Copyright (2012).
61. Ramalho, *supra* note 26, at 22.
62. *Id.*

2. Personality Theory

The personality theory, which is largely derived from the writing of philosophers Hegel and Kant, maintains that a work reflects the personality of the individual who created it, and belongs to that individual.[63] Kant's theory conceptualizes authors' rights as personality rights, as opposed to property rights, and asserts that an author should never lose their inalienable rights over the intellectual content they create. Hegel's theory focuses on freedom. As Becker puts it, if Hegel was correct to assert that there is a connection between the full development of a person's personality and the act of successfully appropriating things as one's "own," and that this could be the basis of a property right, then "it seems natural to suppose that this might be a particularly strong basis for intellectual property. Where, after all, could it be more important to secure the appropriative powers of a personality than for its unique intellectual products?"[64] This justification for copyright law is reflected, to an extent, in the current approach of the CJEU and its focus on a work reflecting the personality of an author in order for such work to be original and benefit from copyright protection, as discussed further in Section 5 below.[65]

Hughes points out that it can be difficult to detect when people do or do not have a "personality stake" in a given work, and that even if this could be detected reliably, it is likely that personality is manifested to varying degrees in different works.[66] There is also what Hughes calls a "categorical" aspect problem with this theory, as "different categories of intellectual property seem to lend themselves to different amounts of personality."[67] Therefore, Hughes suggests that copyrightable technological creations, such as computer software, pose difficult questions for this theory, given that such items tend to "embody strongly utilitarian solutions to very specific needs."[68] For example, "Edison searched for the filament material that would burn the longest, not a filament that would reflect his personality."[69]

Many commentators on natural rights theories find that copyright is a mix of both the property interests that are the basis of the labor theory and the personality interests that are the basis of the personality theory.[70] Generally, civil law jurisdictions tend to adopt the natural rights theory as justification for

63. Margaret Jane Radin, *Property and Personhood,* 34 Stan. L. Rev. 957, 959, 962, 967, 973–78 (1982); G.W. E. Hegel, Elements of the Philosophy of Right (Allen Wood ed., 1991); William Fisher, *Theories of Intellectual Property, in* New Essays in the Legal and Political Theory of Property 168, 171–72 (Stephen Munzer ed., 2001).

64. Lawrence C. Becker, *Deserving to Own Intellectual Property*, 68 Chi.-Kent L. Rev. 609, 610 (1992).

65. Case C-5/08, Infopaq International A/S v. Danske Dagblades Forening, 2009 E.C.R. I-6569, para 45; Case C-145/10, Eva-Maria Painer v. Standard Verlags GmbH et al., 2011 E.C.R. I-12533, para 87; Case C-469/17, Funke Medien NRW GmbH v. Bundesrepublik Deutschland, ECLI:EU:C:2019:623, para 18 (July 29, 2019).

66. Justin Hughes, *The Philosophy of Intellectual Property,* 77 Geo. L.J. 287, 355 (1998).

67. *Id.* at 339.

68. *Id.* at 341.

69. *Id.*

70. Ramalho, *supra* note 26, at 24.; Hughes, *supra* note 66, at 329–30, 365–66; Stef van Gompel, Formalities in Copyright Law: An Analysis of Their History, Rationales, and Possible Futures 218 (2011).

copyright, whereas common law countries tend to base such justification on the utilitarianism theory.[71]

B. Utilitarian Theory

Utilitarianism holds that a "lawmaker's beacon when shaping property rights should be the maximization of net social welfare."[72] Utilitarian theories, therefore, justify providing copyright protection for the purpose of creating an incentive for individuals to undertake creative activities. In other words, they are based on economic incentives. This is because by awarding the creator an exclusive right over an artistic work, the legal system provides that creator an exclusive ability to exploit that work and to exclude any competitor from doing the same.[73] This creates an economic incentive to create, because if competitors could simply copy existing works, such as books or movies, there would not be an adequate incentive for creators to invest their time, money and energy into developing original works and to take the risk of testing such original works on the market.[74] Instead, it would be in each person's self-interest to let others develop such works and then simply mimic their output.[75]

It is important to distinguish this focus on incentives from the idea of granting a creator a "reward," as is seen in the natural rights theories discussed above. In the utilitarian theory, copyright is viewed as a positive right rather than a natural one, which is granted for the wider purpose of furthering societal goals.[76] Consequently, the utilitarian theory suffers from the criticism that it fails to fully justify copyright protection in cases where authors do not need an incentive to create. This can be the case where a creator is incentivized by the act of creating itself, or because the creative activity that they undertake has a very low cost (for example, making a home video, or taking photographs on a smartphone).[77]

Utilitarian justifications for copyright protection are enshrined in the enactment of copyright protections in the Constitution of the United States. The justifications are as follows: "to promote the progress of science and the useful arts."[78] Note that this wording explicitly links copyright with the notion of furthering progress – a utilitarian viewpoint rooted in furthering societal goals as opposed to having the goal of rewarding individual creators.[79] Indeed, it has been said that U.S. copyright law is "concerned with calibrating the optimal level of economic incentive to promote creativity."[80] The U.S. Supreme Court

71. Ginsburg, *supra* note 1, at 134; Wan & Lu, *supra* note 1.

72. William Fisher, *Theories of Intellectual Property, in* New Essays in the Legal and Political THeory of Property168, 169 (Stephen Munzer ed., 2001).

73. Ballardini, He & Roos, *supra* note 54, at 127.

74. Ruth Towse, Creativity, Incentive and Reward: An Economic ANalysis of Copyright and Culture in the Information Age 10–11 (2001).

75. Hettinger, *supra* note 58, at 48.

76. Ramalho, *supra* note 26.

77. *Id.* at 21.

78. U.S. Const. art. I, § 8, cl. 8.

79. Hettinger, *supra* note 58, at 47; Richard Watt, Handbook on the Economics of Copyright: A Guide for Students and Teachers 2 (Richard Watt ed., 2014).

80. Roberta Rosenthal Kwall, The Soul of Creativity: Forging a Moral Rights Law for the United States xiii (2010).

has also expressly stated that "[t]he copyright law . . . makes reward to the owner a secondary consideration . . . . The economic philosophy behind the clause empowering . . . patents and copyrights is the conviction that . . . [it] is the best way to advance public welfare through the talents of authors and inventors in 'Science and useful Arts.'"[81] It has also been claimed that such economic rationales were "also certainly in the minds of the original enactors of the early copyright statues in Europe."[82]

However, affording copyright protection to works also means that the author gains an exclusive right over their work, and thereby also gains the right to prevent other people from using their work. This has the effect of limiting the diffusion of new creations, and the extent to which society can benefit from them.[83] Therefore, there is a necessary implication in utilitarianism that such exclusionary powers must be offset by the incentive, or encouragement, that the exclusionary powers provide to authors to create further works.[84] Lemley notes that "[o]ne of the reasons that intellectual property rights are limited in scope, in duration, and in effect is precisely in order to balance these costs and benefits."[85] The difficulties with achieving this balancing act in formulating the law (a balancing act that is not unique to utilitarian theories of copyright law) are illustrated by the following statement made by Lord Mansfield in the English courts in 1785 when considering a copyright claim concerning navigational charts:

> [W]e must take care to guard against two extremes equally prejudicial; the one, that men of ability, who have employed their time for the service of the community, may not be deprived of their just merits, and the reward of their ingenuity and labour; the other, that the world may not be deprived of improvements, nor the progress of the arts be retarded.[86]

C. Applying the Rationales of Copyright Law to AI-Generated Output

As the philosophies or rationales set out above underpin copyright law, they provide a useful basis to assess whether existing copyright laws can and should accommodate AI-generated works.

From a utilitarian perspective, it has been argued that works created autonomously by AI systems should not qualify for copyright protection as an AI system does not need an incentive to create, nor can they reap the economic benefits of copyright protection.[87] However, this analysis overlooks the fact that human beings are involved in the development of AI systems, so utilitarianism's incentive-based justifications for copyright protection remain relevant, given that it is these developers who may require incentives to develop AI

81. Mazer v. Stein, 347 U.S. 201, 219 (1954).
82. Watt, *supra* note 79, at 2.
83. Mark Lemley, The *Economics of Improvement in Intellectual Property Law,* 75 Tex. L. Rev. 989, 996 (2008).
84. *Id.* at 996–97.
85. *Id.* at 997.
86. Sayre v. Moore, 1 East 361 n.1, 102 Eng. Rep. 139 (Lord Mansfield, C.J.) (1785).
87. Ramalho, *supra* note 26, at 61.

systems that can generate works.[88] Against this, however, it has been said that the relevant AI systems are already likely to be protected by intellectual property law, either in the form of copyright or patent protection. Additionally, Ramalho points out that such developers have a "first-mover advantage" which serves as an economic incentive and is independent of any copyright protection.[89]

Therefore, there are concerns that adding an additional layer of incentive for developers by granting copyright protection to works generated by the AI systems they develop goes beyond what is needed to incentivize development. This is especially so considering that the idea of balance between the advantages and disadvantages to society is inherent in utilitarian copyright justifications.[90] Those who voice these concerns argue that this balance will be not achieved if developers are granted the right to exclude others from using AI-generated works, which comes with a cost to society, and end up benefiting from a double layer of intellectual property protection.[91] This could have the undesirable effect of allowing AI programmers to quickly gain a dominant market position, particularly where AI-generated works compete against works created by human beings. Consider, for example, the concern expressed by the European Parliament's Committee on Culture and Education that "the potential vacuum between IPR and the development of AI . . . could make the cultural and creative sectors and education vulnerable to AI-generated copyright-protected works."[92] Additionally, the Impact Assessment conducted by the UK IPO as part of its consultation on AI and intellectual property rights suggested that there is a need to balance the incentives and rewards offered to those who invest in AI with the costs to third parties who wish to use AI-generated material protected by copyright, such as raised prices and reduced competition.[93]

Furthermore, UNESCO has recognized that there is a risk that the use of AI will increase the "concentration of supply of cultural content, data, markets and income in the hands of only a few actors," an outcome which could have negative repercussions on the "diversity and pluralism of media, cultural expressions, participation and equality."[94] This is a significant risk that could have far-reaching consequences for the creative economy, cultural expression and human creativity, the full extent of which is currently impossible to predict. This requires the attention of policymakers in spheres beyond the scope of copyright law, but it is an important consideration for this topic. This is because it is a risk that could be intensified if the balance of copyright protection tips too far in favor of protecting the owners of AI systems.

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88. Hristov, *supra*, note 2, at 438.

89. Ramalho, *supra* note 26, at 62.

90. *Id.*

91. *Id.*

92. Eur. Parl. Rep. of the Comm. on Legal Aff., Intellectual Property Rights for the Development of Artificial Intelligence Technologies, A9-0176/202 at 25-26 (2020).

93. UK Intell. Prop. Office, *supra* note 10, at 8.

94. UNESCO, *Recommendation on the Ethics of Artificial Intelligence* 1, 4 (2021), https://unesdoc.unesco.org/ark:/48223/pf0000380455 [https://perma.cc/UX6G-W2SB]; UNESCO, *Reshaping Policies for Creativity: Addressing Culture as a Global Public Good* 101 (2022), https://unesdoc.unesco.org/ark:/48223/pf0000380474 [https://perma.cc/593E-SMN3].

However, society as a whole also stands to benefit from properly incentivizing the generation of AI output, and the arguments based on concerns about a double layer of protection do not always fully account for this. The key concern here must be finding the appropriate balance, which is not achieved by flatly denying protection (over output) to the owners or users of AI systems. This viewpoint fails to fully account for the "fundamental correlation between legal protection on the one hand and creativity and innovation on the other."[95] Dornis uses the example of an AI application for music composition to illustrate the correlation, pointing out that if anybody could freely use output generated by an AI application then this raises the question of "who would be interested in buying the application in the first place?"[96] Without interested buyers, there is also less (or even no) economic incentive for the developers. The production of this type of application is one example of the type of benefit society stands to gain if generating AI output is properly incentivized by protecting not only AI systems but also the output itself.

Turning to natural rights justifications, the labor theory and the personality theory both center around the relationship between an author and their work, which appears, at least on the face of it, difficult to square with the idea of granting copyright protection to AI-generated works without a human author.[97] As the labor theory is focused on rewarding the labor that was invested in the creative process, it suffers from a similar criticism as utilitarianism in that it does not apply neatly to AI-generated works given that AI systems do not respond to such rewards (at least for now, when machines do not have consciousness and emotions).[98] However, arguments that use this to reject the idea of providing protection to AI-generated works again overlook the fact that human beings are behind the creation of AI systems and are responsible for putting in place the circumstances in which AI-generated output comes to exist.[99] Dornis uses the illustrative analogy of human beings responsible for planting and growing an orchard, who receive the benefit of not only the first harvest but also the subsequent yields, noting that "[t]herefore, a natural-law perspective hardly justifies rejecting protection for emergent works per se."[100]

As AI systems do not have a human personality, it can be difficult to justify granting copyright protection to works generated by such systems based on personality being reflected in a work. However, as noted in section 4.1.2 above, modern copyright law already protects certain categories of output, such as technological creations, in which it is difficult to find a reflection of human personality. Furthermore, Dornis argues that the personality theory only justifies denial of protection in part, as lower-level protection remains possible given that related or neighboring rights are "not founded on the classic paradigm of romantic authorship" and "are liberated from the requirement of a human creator or author."[101] The potential use of such rights as a way to fill

95. Dornis, *supra* note 5, at 583.
96. *Id.* at 584.
97. Ramalho, *supra* note 26, at 62.
98. *Id.*
99. Dornis, *supra* note 11, at 31.
100. *Id.*
101. *Id.* at 32.

the void caused by the lack of copyright protection for AI-generated creations will be explored below. As is also examined in further detail below, the UK (and some other jurisdictions) already offer computer-generated works a form of such lower-level protection.

IV. Overview of relevant EU Copyright Law

It is pertinent to now turn to an examination of the existing legal framework for copyright in the EU. This is of course the framework under which the copyright status of AI-generated works must be assessed. As will be explored, the role that AI systems now play in the production of works traditionally created by humans (and which traditionally benefit from copyright protection) raises questions that make it necessary to reconsider the fundamental tenets of copyright law (such as the notion of authorship) and the purpose and rationale behind existing copyright law.[102]

A. The Eligibility Criteria for Copyright Protection

Firstly, it must be noted that copyright protection does not cover ideas or facts, as it protects only the expression of ideas and not the ideas themselves. This is explicitly stated in Article 2 of the WIPO Copyright Treaty.[103] Secondly, EU copyright law requires any test of artistic merit.[104] That is, the quality of the work is not relevant in determining whether the work attracts copyright protection.[105] Furthermore, any aesthetic effect generated by a work will not of itself attract copyright protection for that work.[106] As Hartmann et al. note, "[t]his is an important observation in relation to AI-assisted outputs, many of which are undeniably of aesthetic value."[107]

Instead, a key criterion for copyright protection in the EU, and several other jurisdictions, is originality or creativity.[108] Therefore, the test of whether a work is eligible for copyright protection is not one that simply relies on skill or labor. This is reflected in the decision of the Court of Justice of the European Union ("CJEU") in *Football Dataco* that "significant labour and skill" was not a relevant consideration in determining whether lists of football fixtures attracted

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102. Ramalho, *supra* note 26, at 6–7.

103. WIPO Copyright Treaty, Dec. 20, 1996, S. Treaty Doc. No. 105-17 (1997) 2186 U.N.T.S. 121.

104. Case C-683/17, Cofemel – Sociedade de Vestuario SA v. G-Star Raw CV, 2019 EU:C:2019:721, para 54.

105. Stef van Gompel, *Creativity, Autonomy and Personal Touch: A Critical Appraisal of the CJEU's Originality Test for Copyright, in* The Work of Authorship 95 (Mireille van Eechoud ed., 2014).

106. Case C-683/17, Cofemel – Sociedade de Vestuario SA v. G-Star Raw CV, 2019 EU:C:2019:721, para 54.

107. Christian Hartmann et al., *Final Report for the European Commission on "Trends in Artificial Intelligence – Challenges to the Intellectual Property Rights Framework,"* 1, 71 (2020) www.ivir.nl/publicaties/download/Trends_and_Developments_in_Artificial_Intelligence-1.pdf [https://perma.cc/CF23-XX5B].

108. Ramalho, *supra* note 26. at 32. Ramalho's analysis of the law in the EU, US, Australia and Japan finds that this is the case in each of these jurisdictions.

copyright protection "if that labour and skill do not express any originality in the selection or arrangement of that data."[109]

The CJEU case law instead has held that to constitute a "work" that can benefit from copyright protection, such "work" must be original in the sense that it is an expression of an author's own intellectual creation.[110] In other words, an author must have expressed "his creativity in an original manner."[111] The CJEU has further elaborated that what is required is that "the author was able to express his creative abilities in the production of the work by making free and creative choices."[112] In *Painer*, a case involving whether school portrait photographs attracted copyright protection, the CJEU also specifically stated that "[b]y making those various choices, the author of a portrait photograph can stamp the work created with his 'personal touch'."[113] Again in *Football Dataco*, the Court reiterated the idea of "personal touch" being imparted by an author making "free and creative choices."[114]

In short, meeting the requirement for originality requires the authors to have made creative choices, and although creativity is typically viewed as a human concept, AI is now challenging this notion. As noted above, there are now many examples of pieces of art, music, and other subject matter that would benefit from copyright protection if they were created by a human. However, the approach taken in EU copyright law poses serious challenges for any argument that such works created autonomously by AI should benefit from copyright protection, given that "personal touch" implies a reflection of human personality that is not present in the actions of a machine. This approach also appears to assume that an author is a human being. The same can be said of the approach in some EU member states, including, for example, Italy where the Supreme Court has held that to be original a work must "bear the imprint of the author's personality."[115] The implication here is clearly that an author, having a personality, must be a human being. As Ciani puts it, "the lack of the willful intention to impress the stamp of its own personality on its artistic

109. C-604/10, Football Dataco et al. v. Yahoo! UK Ltd. et al., ECLI:EU:C:2012:115, para 42 (Mar. 1, 2012).

110. Case C-833/18, SI and Brompton Bicycle Ltd. v. Chedech / Get2Get, ECLI:EU:C:2020:461, para 22 (June 11, 2020); Case C-683/17, Cofemel – Sociedade de Vestuario SA v. G-Star Raw CV, 2019 EU:C:2019:721, paras 24 and 29; Case C-5/08, Infopaq International A/S v. Danske Dagblades Forening, 2009 E.C.R. I-6569, para 37; C-145/10, Eva-Maria Painer v. Standard Verlags GmbH et al., 2011 E.C.R. I-12533, para 87; C-604/10, Football Dataco et al. v. Yahoo! UK Ltd. et al., para 37 (March 1 2012); Case C-393/09, Bezpečnostní Softwarová Asociace, 2010 E.C.R. I-1397, para 45; Joined Cases C-403/08 and C-429/08, Football Association Premier League et al., 2011 ECR I-9083, para 97.

111. Case C-5/08, Infopaq International A/S v. Danske Dagblades Forening, 2009 E.C.R. I-6569, para 45.

112. Case C-469/17, Funke Medien NRW GmbH v. Bundesrepublik Deutschland, ECLI:EU:C:2019:623, para 23 (July 29 2019); C-145/10, Eva-Maria Painer v. Standard Verlags GmbH et al., para 87.

113. Eva-Maria Painer v. Standard Verlags GmbH et al., para 92.

114. C-604/10, Football Dataco and Others v. Yahoo! UK Ltd et al., para 38 (March 1, 2012).

115. Ciani, *supra* note 14, at 281 (translating a decision of the Italian Supreme Court, Jan. 12, 2018, no. 658).

effort might be an argument for excluding the non-human creative activity from copyright protection."[116]

On the other hand, there are arguments that "the willingness of the creative act is not required for a proper attribution of authorship."[117] For example as is arguably demonstrated by the fact that works created by minors and incapacitated persons can benefit from copyright protection and such persons can be recognized as the authors of such works.[118] This point of view is also arguably supported by the fact that the test of originality in EU copyright law does not entail a high standard or difficult to obtain threshold of such originality.[119] In fact, the CJEU's case law shows that level of such creativity required in "creative choices" can be interpreted as being fairly low, so long as the author's creative freedom has not been constrained by external factors.[120] This has led to copyright applying to a variety of objects that demonstrate "minimal creativity," and that even have "no unique distinctiveness."[121] For example, in *Painer*, even though school portraits tend to follow a standard format, the fact that the photographer could make choices regarding aspects such as lighting, background, the angle and framing of the photograph, and how to develop the photograph were all relevant creative choices that would allow the work to be given the personal stamp of the photographer.[122] In *Infopaq* the CJEU also suggested that a piece of text containing only 11 words could benefit from copyright protection.[123] At a national level, in the Netherlands works including '"passport photographs, striped wallpaper, the design of simple games like 'four in a row' and designs of basic holiday homes" have benefited from copyright protection.[124]

However, this low bar for protection nevertheless applies only to expressions of human creativity—with the human aspect being an essential criterion. It remains clear that EU copyright law has an anthropocentric foundation and aims to protect original expressions of human creativity, even if the level of creativity required in order to attract such protection is minimal. In this sense, the CJEU's jurisprudence leaves room for the possibility of copyright protection attaching to output created with the assistance of AI, especially considering the court's emphasis on creative choices and the resulting focus on the creative process (as opposed to the relevant act of expression).[125] Therefore, if

116. *Id.*
117. *Id.*
118. *Id.*
119. Gompel, *supra* note 105, at 95.
120. *Id.* at 100.
121. *Id.* at 96.
122. C-145/10, Eva-Maria Painer v. Standard Verlags GmbH and others, 2011 E.C.R. I-12533, paras 90-92.
123. Case C-5/08, Infopaq International A/S v. Danske Dagblades Forening, 2009 E.C.R. I-6569, paras 48-51.
124. P.B. Hugenholtz, Works of Literature, Science and Art, in A Century of Dutch Copyright Law: Auteurswet 1912–2012 33, 44 (P.B. Hugenholtz, A.A. Quaedvlieg & D.J.G. Visser eds. 2012) (summarizing the following cases: Cantonal Court Haarlem July 7, 2010, LJN: BN0985 (passport photograph); The Hague Court of Appeals Mar. 6, 2009, KG ZA 08-1667 (striped wall paper)).
125. P.B. Hugenholtz & J.P. Quintais, *Copyright and Artificial Creation: Does EU Copyright Law Protect AI-Assisted Output?,* 52 Int'l Rev. Intell. Prop. & Competition L. 1190, 1200 (2021).

any creative choices made by a human being during the creation process are reflected in the final work, the work is likely to be eligible for copyright protection.[126] Hugenholtz and Quintais have suggested that "even a combination of fairly obvious choices in the design, execution and editing of an AI-assisted output could suffice."[127]

Such a conclusion is arguably supported by the CJEU's finding in *Painer* that human creations protected by copyright can include works created with the aid of a tool such as a camera.[128] Many national copyright laws hold that execution alone does not make an individual an author, and instead "authorship places mind over muscle . . . an 'author' conceives of the work and supervises or otherwise exercises control over its execution."[129] Ramalho has also commented that the broadness of the scope of relevant acts for a finding of originality, as discussed in Section 5.1 above, is to the advantage of AI-generated works—for example, it could be argued that the preparation phase of training the AI system in the context of machine learning could eventually qualify as a creative choice that would give the work its original character if there is sufficient causal connection between the work and the person who created it.[130]

It certainly seems likely that in the case of works produced by humans with assistance from AI, it is likely that it will be possible to find the "sufficient causal connection" to which Ramalho refers. However, for truly autonomous AI systems, this will not be the case. Creativity and originality for the purposes of EU copyright law require the "personal touch" of an author,[131] and for a truly autonomous AI system, the imprinting of "personal touch" on a work remains a difficult, if not impossible, criterion to fulfil. If personal touch and creative choices by a human being are not a sufficient part of the process, one might consider such AI-generated works to not be comparable to the photographs in *Painer*, and instead to be closer to the military reports in *Funke Medien,* which the CJEU suggested may not benefit from copyright protection as there was not sufficient room for creative choices to be made in their preparation.[132]

B. Can Output Produced Autonomously by AI Systems be Creative?

In the case of such autonomously AI-generated works, one view is that such output should not be protected by copyright, because the process does not involve creative choices by humans so as to "generate the originality required to benefit from copyright protection."[133] This view has also been considered in the European Parliament's Resolution on Intellectual Property Rights for the Development of Artificial Intelligence Technologies, which noted that works produced autonomously by AI systems may not benefit from copyright

126. *Id.*
127. *Id.* at 1199.
128. Case C-145/10, Eva-Maria Painer v. Standard Verlags GmbH et al.thers, 2011 E.C.R. I-12533.
129. Ginsburg & Ricketson, *supra* note 4, at 1072.
130. Ramalho, *supra* note 26, at 28-29.
131. Eva-Maria Painer v. Standard Verlags GmbH et al., para 92.
132. Case C-469/17, Funke Medien NRW GmbH v. Bundesrepublik Deutschland, ECLI:EU:C:2019:623, para 23 (July 29 2019).
133. Gervais, *supra* note 18, at 2068.

protection due to the principle of originality, "which is linked to a natural person, and since the concept of 'intellectual creation' addresses the author's personality."[134] The EU is not the only jurisdiction in which this conclusion may be reached. In her analysis of the copyright laws in the EU, United States, Australia and Japan, Ramalho concludes that "[w]here there is no human author, a work cannot be original; and without originality, a work cannot be protected by copyright."[135]

However, an interesting observation is made by van Gompel in pointing out a flaw in the current law by asking: "If copyright law's originality criterion is so tied to the individual author, how then must the original character of large-scale collaborative works, such as Wikipedia entries, be assessed?"[136] This question offers a useful example of the shortcomings in copyright law, and in particular with the concepts of originality and creativity, that are not unique to AI-generated works. As van Gompel concludes, current law faces difficulties when it comes to examining the copyright status of large-scale collaborative works, especially with regard to the requirement for there to be a "personal imprint" of the creators.[137] This is a strikingly similar problem to the one that any works autonomously created by AI systems will face.

There is also some discomfort with the very idea that the output of machines could be considered "creative" in the same way that human output is. Guadamuz has noted that "[a]rt, music, and literature are quintessentially human, and any effort to allocate creativity to artificial intelligence feels wrong."[138] This discomfort stems from the idea that AI cannot really exercise creativity or other original thought, or at least that it is very limited in this regard. Therefore, it may be felt that AI systems can never be creative because, as Eshraghian puts it, "[n]eural networks fundamentally transform a set of discrete, limited-domain input parameters into another set of discrete, limited-domain output parameters, using a set of pre-defined functions."[139]

However, there are commentators who reject the idea that AI systems cannot be creative. Grubow refers to "computational creativity," which can be summarized as the use of computers to generate creative outcomes.[140] Grubow also rebuts the argument that neural network-based creativity is insufficient for authorship because it requires humans to train it by pointing out that human creativity also requires training.[141] Grubow's argument is an interesting one and certainly has at least some merit in rebutting the specific argument it targets, although it does not account for human creativity that does not require particular training, such as that of an untrained amateur painter or the sketches

134. European Parliament, Resolution of 20 October 2020 on Intellectual Property Rights for the Development of Artificial Intelligence Technologies, at para 15, Eur. Parl. Doc. 2020/2015(INI) (Oct. 20, 2020).

135. Ramalho, *supra* note 26, at 53.

136. Gompel, *supra* note 105, at 127.

137. *Id.* at 138.

138. Guadamez, *supra* note 6.

139. Jason K. Eshraghian, *Human Ownership of Artificial Creativity,* 2 Nature Mach. Intel. 157, 157 (2020).

140. Grubow, *supra* note 21, at 408.

141. *Id.* at 410.

of a toddler. Nor does it account for the fact that copyright law protects these sorts of outputs and requires a very minimal level of creativity—so long as it is human creativity.

Dornis articulates a useful distinction in this respect by distinguishing between normative creativity and objective creativity in order to analyze the status of AI-generated output. Whereas normative creativity requires a "human spark," objective creativity requires "objectively denominating the fabrication of products that would be sufficiently creative and copyrightable had they been made by a human author or creator."[142] It is also worth noting that in any case, the European Parliament has recognized that in relation to the condition of originality, "the general trend . . . is to work towards a concept of relative novelty, making it possible to distinguish a protected work from works already created."[143] It also seems that there is a growing consensus that output generated by an AI system could be deemed a work of art based on the outcome: that is, the creative result and not the creative process.[144] As noted in Section 4.1.2 above, there are already technological creations that enjoy copyright protection despite what seems to be a lack of creativity, in the sense of creativity that reflects human personality, embodied in them.[145]

Nevertheless, for the time being, EU copyright law retains an anthropocentric focus, and the jurisprudence of the CJEU makes it clear that it considers human creativity to be an essential criterion for copyright protection. This human focus is compounded by the fact that EU law (and the law of many other jurisdictions) presumes that the author of a copyrighted work will be a human being, as is examined further below.

C. Authorship

As Ballardini, He and Roos note, "[a]uthors are always the starting point and centre of any discussion on copyright law."[146] This remains true for any analysis of copyright protection for AI-generated subject matter. As copyright is generally held (at least initially) by the relevant author of a work, without an author there is no copyright protection. Therefore, the question arises as to whether an AI system can ever, legally speaking, be an author. In short, it seems that most jurisdictions agree that an author must be a human being.[147] This is evidenced by an examination conducted by Ginsberg of the laws of the civil law jurisdictions of France, Belgium, the Netherlands, and the common law jurisdictions of the UK, United States, Canada, and Australia.[148] An examination of the instruments of international law, EU directives, and the case law of the CJEU also lead to a similar conclusion, as detailed below.

142. Dornis, *supra* note 11, at 10.
143. Intellectual Property Rights for the Development of Artificial Intelligence Technologies at 13, Eur. Parl. Doc. 2020/2015(INI) (Oct. 2, 2020). [*See* 21.9(b)(ii)].
144. *Id.*
145. Hughes, *supra* note 66, at 341.
146. Ballardini, He & Roos, *supra* note 54, at 120.
147. Ginsburg & Ricketson, *supra* note 4, at 1066.
148. *Id.*

1. Authorship Under International Copyright Law

Although there are international conventions relating to copyright, there is not yet systematic international regulation specifically dealing with the initial ownership of such rights.[149] The Berne Convention, for example, does not define the term "author," although it is used throughout the convention.[150] Nor does it provide guidance on what the terms author or authorship mean.[151] Ricketson suggests that this may be because the Member States shared an understanding as to what was meant by "author" and did not feel that further explanation of the term was necessary at the time that the Berne Convention was agreed upon.[152]

Hugenholtz and Quintais further suggest that the Berne Convention's "text and historical context strongly suggest that 'author' and 'authorship' for the purposes of the Convention refer to the natural person who created the work."[153] For example, Articles 6 and 7 refer to the life and death of an author in relation to the term of protection, which suggests that the author must be a natural person.[154] Furthermore, the fact that Article 6 expressly grants moral rights to "authors" has been taken as confirmation that the copyright protections it grants are "triggered only by acts of human creation."[155] The WIPO Copyright Treaty and the TRIPs agreement similarly do not provide a definition, although both instruments require compliance with the Berne Convention.[156]

It is also noteworthy that both the Universal Declaration of Human Rights[157] and the International Covenant on Economic, Social and Cultural Rights[158] acknowledge that "everyone" has the right to protection of interests in certain works of which "he is the author," and the preambles make it clear that "everyone" refers to "all members of the human family."[159]

2. Authorship Under EU Law

Turning to EU legal instruments, some directives, including Directive 2001/29/EC on the harmonization of certain aspects of copyright and related

149. Ciani, *supra* note 14, at 279.

150. *See generally* Berne Convention for the Protection of Literary and Artistic Works, Sept. 9, 1886, as revised at Paris on July 24. 1971 (1161 U.N.T.S. 3) [hereinafter Berne Convention].

151. *See generally id,*

152. Sam Ricketson, *The 1992 Horace S. Manges Lecture - People or Machines: The Berne Convention and the Changing Concept of Authorship,* 16 Colum.-Vla J.L. & Arts1, 8 (1991-1992).

153. Hugenholtz & Quintais, *supra* note 125, at 1195.

154. Berne Convention, *supra* note 150, art. 6-7.

155. *Id.*

156. WIPO Copyright Treaty, Dec. 20, 1996, S. Treaty Doc. No. 105-17 (1997) 2186 U.N.T.S. 121; Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299.

157. G.A. Res. 217 (III) A, art. 27, Universal Declaration of Human Rights (Dec. 10, 1948).

158. International Covenant on Economic, Social and Cultural Rights, art. 15(1)(c), *opened for signature* Dec. 19, 1966, 993 U.N.T.S. 3.

159. G.A. Res. 217 (III) A, Universal Declaration of Human Rights (Dec. 10, 1948); International Covenant on Economic, Social and Cultural Rights, *opened for signature* Dec. 19, 1966, 993 U.N.T.S. 3.

rights in the information society (the "Information Society Directive")[160] and Directive 2019/790/EU of 17 on copyright and related rights in the Digital Single Market (the "Copyright Directive")[161] are silent about the meaning of "author" or "authorship." In contrast, Article 4 of Directive 1996/9/EC on the legal protection of databases (the "Database Directive) provides that "the author of a database shall be the person or group of natural persons who created the database or, where the legislation of the Member States so permits, the legal person designated as the rightholder by that legislation."[162] Similarly, Article 2(1) of Directive 2009/24/EC on the legal protection of computer programs (the "Computer Programs Directive") states that "the author of a computer program shall be the natural person or group of natural persons who created the program or, where the legislation of the Member State permits, the legal person designated as the right holder by that legislation."[163]

As can also be observed from these provisions, while there are references to natural persons, the EU Member States are also given some flexibility to define authorship by legal persons. However, as Ramalho notes, "references to natural persons and moral rights in the original Proposal for a Software Directive lead to the conclusion that not only legal persons were not to be considered as authors, but also that authors were necessarily human beings."[164] This can be seen, for example, in language that refers to authorship being resolved "in favour of the natural person or group of persons who have created the work" and references to the authors "unalienable rights to claim paternity of his work."[165] It is also noteworthy that the recitals to the Copyright Directive refer to 'authors' in a way that suggests the references are meant to refer to natural persons by, for example, making reference to the "weaker contractual position" that "authors and performers" tend to be in when granting a license to their rights.[166] Directive 93/98/EEC harmonizing the term of protection of copyright and certain related rights (the "Term Directive") also supports Ramalho's conclusion, given that the preamble defines original as a work that is "the author's own intellectual creation reflecting his personality."[167] As Handig notes, "[t]he expression 'author's own intellectual creation' clarifies that a human author is necessary for a copyrighted work."[168]

Furthermore, although EU copyright law does not expressly state that a human author is required, its anthropocentric focus is "self-evident in many aspects of the law."[169] This is borne out in the case law of the CJEU which suggests that originality relies on the idea of a human engaging in creative acts

160. Directive 2001/29, 2001 O.J. (L 167) 10.
161. Directive 2019/790, 2019 O.J. (L 130) 92.
162. Directive 96/9, art. 4(1), 1996 O.J. (L 77) 20.
163. Directive 2009/24/EC, art. 2(1), 2009 O.J. (L111) 16.
164. Ramalho, *supra* note 26, at 31.
165. Commission on the European Communities, 'Proposal for a Software Directive-Explanatory Memorandum (COM (88) 816 final, 1989) 20.
166. Directive 2019/790, recital 72, 2019 O.J. (L 130) 92.
167. Council Directive 93/98, art. 9, 1993 O.J. (L 290) 9 (EEC).
168. Christian Handig, *The Copyright Term "Work" - European Harmonisation at an Unknown Level,* 40 Int'l Rev. Intell. Prop. & Competition L. 665, 668 (2009).
169. Hugenholtz & Quintais, *supra* note 125, at 1195.

that reflect creative choice.[170] For example, in *Brompton Bicycle*, the CJEU held that the author's personality must be reflected in the subject matter in order for it to be considered original.[171] As noted above, this is also seen in *Painer,* in which the Court found that "[b]y making those various choices, the author of a portrait photograph can stamp the work created with his 'personal touch.'"[172] Indeed, in the CJEU-endorsed opinion of Advocate General Trstenjak in *Painer*, this concept is deduced from Article 6 of the Term Directive that "only human creations are therefore protected, which can also include those for which the person employs a technical aid, such as a camera."[173]

Finally, Ciani suggests that although the Information Society Directive and the Copyright Directive do not define "author," "authorship" or "copyright holder," and are silent as to the legal capacity that is required in order to exercise the rights of a copyright holder, that silence must be interpreted in line with: articles 1 to 21 of the Berne Convention and previous Directives in force.[174] Although the EU is not a party to the Berne Convention, it is obliged to comply with it under Article 1(4) of the WIPO Copyright Treaty (to which the EU is a party and which Directive 2001/29/EC implements); andprinciples already set out in relevant existing EU directives, and in particular, to Recital 13 of the Term Directive which refers to authors as "one or more physical persons,"[175] and also to Article 4 of the Database Directive, which refers to an author as "the natural person or group of natural persons."[176] This leads Ciani to the conclusion that "both international and EU legal framework, as they are currently configured, cannot vest copyright over a machine-generated work."[177]

It is also worth noting that the national law in some EU member states also suggests that an author must be a human being. For example, Article 5(1) of the Spanish Intellectual Property Statute explicitly states that an author is the "natural person" who creates a work (although Article 5(2) provides that legal persons may benefit from the legal protections of authors were the law expressly provides for it).[178] In the German Copyright Act, a copyrightable work must be the author's "own intellectual creation," implying the necessary involvement of a human being.[179]

In conclusion, an analysis of the jurisprudence of the CJEU leads one to conclude that, although the logic is not without its flaws, "authors" of copyrighted works must be natural persons, and where a machine such as an AI-system is used, authorship can only be established by identifying a human

170. Case C-833/18, SI and Brompton Bicycle Ltd. v. Chedech / Get2Get, ECLI:EU:C:2020:461, para 23 (June 11, 2020).
171. *Id.*
172. Case C-145/10, Eva-Maria Painer v. Standard Verlags GmbH et al., 2011 E.C.R. I-12533, para 92.
173. *Id.*
174. Ciani, *supra* note 14.
175. Council Directive 93/98, 1993 O.J. (L 290) 9 (EEC).
176. Directive 96/9, art. 4, 1996 O.J. (L 77) 20.
177. Ciani, *supra* note 14, at 280.
178. Intellectual Property Statute art. 5(1) (B.O.E. 1987) (Spain).
179. Ureberrechtsgesetz [Copyright Act], Sept. 9, 1965, Bundesgetsetzblatt at 1, 1273, § 2(2) (Ger.)).

person behind the creation. Therefore, as the law in the EU stands, if a work were to be entirely and autonomously created by an AI system in such a way that it was not possible to trace a human author, such a work would not benefit from copyright protection.

V. The British Approach to Copyright Protection

Although the UK has now left the EU, it remained a member state until 2020. Therefore, much of the copyright law in the UK during the time of membership developed in line with harmonized EU law on the subject and remains aligned with the EU laws analyzed above. However, the UK (and the Republic of Ireland, which remains an EU member state), is a common law jurisdiction, in contrast to the civil law systems in the other EU member states. This is part of the reason that the approach to copyright law in the UK, and in Ireland which follows a similar legal tradition to the UK, has historically differed from that elsewhere in the EU, as explored further below.

A. The "Sweat of the Brow" Approach

Traditionally, copyright law in the UK was less focused on finding creative steps in order to establish copyright protection and instead focused on whether there had been "labour, skill, and/or judgement" in determining if a given work was original (also known as a "sweat of the brow" approach).[180] This was generally considered to be a lower threshold of eligibility for copyright protection than that which existed in civil law jurisdictions in the EU.[181]

For some time, the prevailing understanding was that the determination of the standard for originality required in copyright law was a matter for national law in EU member states, as it was largely unharmonized at the EU level.[182] This was the case until the introduction of Directive 91/250/EEC on the legal protection of computer programs (the "1991 Software Directive"), followed by the Database Directive and the Term Directive. These directives introduced a definition of originality in relation to software, databases and photos, which focused on the idea of the "author's own intellectual creation."[183] The assumption that surrounded the introduction of this originality standard was that it was the result of an attempt to compromise between the varying thresholds for originality that existed in EU member states.[184] This assumption is supported by the 2000 Commission Report on the Software Directive which expressly states that the originality standard set out in that directive represents

180. Walter v. Lane, [1900] A.C. 539 (UK); University of London Press Ltd v. University Tutorial Press Ltd., [1916] 2 Ch 601 (UK); Ladbroke v. William Hill, [1964] 1 All ER 465 (UK).

181. Ramalho, *supra* note 26, at 26.

182. Stef van Gompel, *Creativity, Autonomy and Personal Touch: A Critical Appraisal of the CJEU's Originality Test for Copyright, in* The Work of Authorship 96-97 (Mireille van Eechoud ed., 2014).

183. Council Directive 91/250, art. 1(3), 1991 O.J. (L 122) 42 (EEC); Directive 96/9, art. 3(1), 1996 O.J. (L 77) 20; Council Directive 93/98, art. 6, 1993 O.J. (L 290) 9 (EEC).

184. Ramalho, *supra* note 26, at 26.

a compromise that required a majority of member states to lower their thresholds for granting copyright protection, and the remaining minority of member states to "lift the bar."[185] It is safe to conclude that the UK (along with Ireland) was a member of this minority due to their "sweat of the brow" approach. The standard introduced in the directives then formed the basis for the originality test set out by the CJEU in cases, such as *Infopaq* and *BSA*,[186] leading to the harmonization of this standard across member states for all copyrightable subject matter (no longer limited to software, databases and photographs as covered by the directives).

Therefore, the approach in the UK came to follow EU jurisprudence on this matter and moved away from the "sweat of the brow" approach.[187] Although the UK has now exited the EU, the "intellectual creation" test set out in the EU case *Infopaq* was adopted into English law by the English High Court in 2013.[188] Regarding AI-generated output, it is worth noting that the "sweat of the brow" approach potentially allows greater scope for affording copyright protection to such items. This approach aligns more closely with the labor theory of copyright law than the personality theory, and in doing so it focuses less on the question of whether an author's personality is imprinted on a work. However, this does not necessarily mean it is devoid of any human-centric concerns. The very terminology used relies on human characteristics—a machine of course neither sweats nor has a brow—and the metaphor conjures up images of human labor. That said, the term "sweat of the brow" is used as a metaphor to refer to the work put in by an author, and it seems conceptually easier to agree that a machine can "work" than it is to find that a machine can have a "personality."

Furthermore, if considering whether output produced with the assistance of AI (rather than autonomously by AI) benefits from copyright protection, the "sweat of the brow" approach seems to face fewer challenges than an approach focused on creativity and personal touch. Although such works are not the focus of this thesis, it is worth noting that while establishing the copyright status of AI-assisted works faces issues regarding how to establish if the personality of a human being involved in the output generating process has been reflected in the output (which gives rise to the issue of how closely this human must have been involved),[189] the sweat of the brow approach does not face as many obstacles in this respect. If a human being has invested their intellect, time, money, energy or other resources into the process by which an AI system produces output, finding the "sweat of the brow" necessary to identify that human as an author is a more straightforward question than trying to find their personality imprinted on the output.

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185. Report from the Commission to the Council, the European Parliament and the Economic and Social Committee on the Implementation and Effects of Directive 91/250/EEC on the Legal Protection of Computer Programs, at 6, COM (2000) 199 final (Apr. 10, 2000).

186. Case C-5/08, Infopaq International A/S v. Danske Dagblades Forening, 2009 E.C.R. I-6569, paras 48-51; Bezpečnostní Softwarová Asociace, 2010 E.C.R. I-1397, para 45.

187. SAS Institute Inc v. World Programming Ltd [2013] EWHC 69 (Ch) (UK).

188. *Id.*

189. Eshraghian, *supra* note 139, at 157.

Nevertheless, for now, the approach to copyright in the UK retains the requirement for a work to be original in the sense that it is an author's own intellectual creation. Indeed, this was recently summarized by the UK IPO, in their publication of a consultation on AI and intellectual property, as meaning that such author must have "made free and creative choices" and the work has their "personal touch."[190]

B. The British Approach to Copyright Protection of Computer-Generated Works

Another notable feature of copyright law in the UK is the express provision for the authorship of computer-generated works in cases where "there is no human author."[191] This is achieved using what Ramalho calls a "legal fiction."[192] In the British Copyright Act, authorship of works generated by computers is given to the person by whom the arrangements necessary for the creation of the work were undertaken.[193] A number of other common law countries, including Ireland, as well as New Zealand, Hong Kong, South Africa, and India take a similar approach.[194] Notably, most of these jurisdictions use "practically the same formulation," for their equivalent legal provisions, having seemingly taken inspiration from the UK.[195] The term of protection for such works runs from the date of their production. In the UK, for example, the work will benefit from copyright protection for 50 years.[196] Such works do not benefit from any moral rights.[197] The limit on the term of protection and the lack of moral rights leads Dornis to comment that the protection provided is more akin to a *sui generis* protection than "a genuine authorial copyright."[198]

Nevertheless, this approach offers a way to provide works created by AI, which would otherwise be authorless, with protection. This has been described as creating "an exception to all human authorship requirements by recognizing the work that goes into creating a program capable of generating works, even if the creative spark is undertaken by the machine."[199] This is a clear departure from the usual approach in which an author is the one who creates a given work. This usual approach is seen for example in section 9(1) of the UK Copyright Act, which states that "author" means, "in relation to a work . . . the person who creates it."[200]

However, the UK approach is "perhaps deceptively straightforward."[201] For example, there is some difficulty in understanding how originality is to be

190. UK Intell. Prop. Off., *supra* note 10.
191. Copyright, Designs and Patents Act 1988, ch. 48, § 178, (UK).
192. Ramalho, *supra* note 26, at 59.
193. Copyright, Designs and Patents Act 1988, ch. 48, § 9(3), (UK).
194. Copyright and Related Rights Act, 2000 (Art No.28/1976) § 2(1) and § 21(f) (Ir.); Copyright Act 1994, § 5(2)(a) (N.Z.); Copyright Act 98 of 1978 § 1(1)(h) (S. Afr.); Copyright Act, 1957, § 2(d)(vi) (India).
195. Guadamuz, *supra* note 6.
196. Copyright, Designs and Patents Act 1988, ch. 48, § 12(7), (UK).
197. *Id.* § 81(2).
198. Dornis, *supra* note 11, at 4.
199. Guadamuz, *supra* note 12.
200. Copyright, Designs and Patents Act 1988, ch. 48, § 9(1), (UK).
201. Guadamuz, *supra* note 6.

determined within this regime, as there seems to be an inconsistency with the requirement for a work to be "an author's own intellectual creation" requiring creative steps, as discussed above.[202] As the author of a computer-generated work is so by way of "legal fiction"[203] and not because they created the work in question, originality cannot be assessed by reference to them. Questions of whether such a work is an author's own intellectual creation or reflects the author's personality would not be relevant. This leads McCutcheon to suggest that it seems originality is, therefore, to be determined using a hypothetical question: "If the work had been authored by a human, or if that human could be identified, would it be original?"[204] This question uses a standard of objective, rather than normative creativity.

An alternative view is that section 9(3) provides an exception to originality requirements. When discussing the enactment of the UK Copyright, Designs and Patent Act (1988), the House of Lords discussed the exemption of section 9(3) from the regime for applying moral rights.[205] Lord Beaverbrook commented that "[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."[206] Guadamuz infers from this that "the law recognizes that there is no creative input in computer-generated works, and therefore section 9(3) has been framed as an exception to the creativity and originality requirements for the subsistence of copyright."[207] However, despite Guadamuz's inferences, it seems that even the UK IPO has recognized that the current law contains some ambiguity regarding the originality requirement.[208]

Before the UK departed from the EU, European copyright law was taking a very different direction with regards to originality than British law, which could have proved "to be a clash with regards to the long-term viability of the UK's approach."[209] However, as the UK is no longer in the EU, questions regarding "[t]he standard of 'originality' applicable to computer-generated outputs that do not reflect human creative input is a matter for UK law alone,"[210] or in other words, the direction of EU Copyright Law no longer poses such a threat to the viability of the UK's approach. That said, the current law in the UK continues to contain the originality requirements of EU law, and decisions of the European Court of Justice given before December 31, 2020 remain binding

202. *Id.*
203. Ramalho, *supra* note 26, at 59.
204. McCutcheon, *supra* note 6, at 51.
205. HL Deb (Feb. 25, 1988) (493) col. 1305.
206. *Id.*
207. Guadamuz, *supra* note 12.
208. *See* UK Intell. Prop. Off., *supra* note 10 (noting that if Section 9(3) were to be reformed, the IPO assumes it would not contain an originality requirement thus "removing some ambiguity from the present law".)
209. Guadamuz, *supra* note 6.
210. Martin Kretschmer, Bartolomeo Meletti & Luis H. Porangaba, *Artificial intelligence and intellectual property: copyright and patents—a response by the CREATe Centre to the UK Intellectual Property Office's Open Consultation,* 17(3) J. Intell. Prop L. & Prac. 321, 322 (2022); Lionel Bently et al., Intellectual Property Law 118 (5th ed. 2018).

on UK Courts.[211] Therefore, for now, the uncertainty as to how the regime for authorship in computer-generated works sits alongside this still remains. Although the UK now has more flexibility to try and resolve this uncertainty, it has not yet done so and recently decided to leave this law unchanged, as discussed further below.[212]

Unfortunately, section 9(3) of the British Copyright Act has only been considered in one decision by the British courts, which focused on what is meant by "arrangements," and did not address the meaning of originality in this context. In *Nova Productions Ltd. v. Mazooma Games Ltd*, the Court of Appeals held that the user of a video game was not the author of frame images generated by playing the game in question; instead, the individual responsible for programming and designing the game was found to be the person by whom the arrangements were undertaken and was thereby the author.[213] U.S. courts have reached similar conclusions when considering video games and have held that the owner of the copyright in the video game code is also the owner of the copyright in the game displays, even where the displays are generated by the actions of the player.[214]

This has led Ramalho to comment that "[t]his raises legitimate doubts as to the usefulness of the regime for computer-generated works and their quest for authorship, at least in cases where the user does not perform that relevant a role in computer games."[215] This is one of the reasons that Ramalho is a strong critic of the idea of extending this approach to computer-generated works to other jurisdictions, pointing to the lack of legal certainty that arises from "[t] he uncertainty regarding the person by whom arrangements are undertaken, who will have to be identified on a case-by-case basis."[216] This uncertainty stems from questions as to how to interpret the meanings of "arrangements," who can be identified as being responsible for such arrangements (for example whether it is the person responsible for building the core AI system or the person responsible for training it), what the appropriate proximity between the person and their "arrangements" is, and how to answer these questions when there are multiple people involved in building, training, or otherwise "arranging" the system.[217]

It is also worth noting the criticism Ricketson made back in 1992 of approaches that vest copyright ownership in the person or entity that undertakes the arrangements necessary for the creation of the work. Ricketson noted that such references to human contributors "may well prove fanciful as the development of expert systems and artificial intelligence increases the likelihood of

211. HMRC v. Perfect [2022] EWCA Civ 330 (UK); European Union (Withdrawal) Act 2018, ch. 16, § 7A (UK).
212. UK Intell. Prop. Off., *supra* note 10.
213. Nova Productions Ltd. v. Mazooma Games Ltd. [2006] RPC 379 (UK).
214. Annemarie Bridy, *Coding Creativity: Copyright and the Artificially Intelligent Author*, 5 Stan. Tech. L. Rev. 1, 24 (2012) (citing Stern Electronics, Inc. v. Harold Kaufman 669 F.2d 852 (2nd Cir. 1982) and Williams Electronics, Inc. v. Artic International, Inc., 1981 WL 1287 (D.N.J. 1981)).
215. Ramalho, *supra* note 26, at 60.
216. *Id.*
217. Ciani, *supra* note 14, at 282.

the creation of purely computer-generated works."[218] These legal provisions were created when "today's advancements in automated creation were far from being foreseeable" and so there is doubt as to whether they can be "interpreted as covering situations where the end work is created autonomously (indeed with humans not being active at all)."[219] Section 9(3) requires the identification of a human being who undertook the necessary "arrangements." If there is no human involvement in the output generating process (as the system acted autonomously), then it seems that this threshold will not be overcome unless the boundaries of what constitutes sufficient input are stretched to encompass very minimal or initial involvement.[220]

These issues with this approach ultimately lead its critics to conclude that it should not be replicated in other jurisdictions, nor should it be extended in the jurisdictions in which it already exists. Ramalho also argues that doing so would be unnecessary because it still requires looking for a human being in the creative process, which is something already required in the jurisdictions that do not have this regime, and it would also be disadvantageous because the human being who undertakes the arrangements (the criteria for being identified as the author) "is not inevitably the one who is closer to the creative essence of the work, which puts into question the compatibility of the regime with copyright's internal consistency."[221]

While it is true that the "arrangements" wording suffers from a lack of clarity, Ramalho's criticism that this regime requires looking for a human being seems lacking, given that unless AI-systems are to be recognized as capable of holding copyright themselves (an unlikely scenario that is discussed further in section 8.2 below), identification of a human being who will be the owner of the copyright, or any other related right in the output, will always be necessary. The key difference with a regime that would recognize copyright for AI-generated output is that it would (the lack of clarity around how originality requirements in the British regime work aside) provide this protection even if the output could not be considered that human being's own intellectual creation. Moreover, while Ramalho is critical of the fact that this approach requires the person by whom arrangements are undertaken "to be identified on a case-by-case basis," which she states "does not favour legal certainty,"[222] she proposes using a three-step test on a case-by-case basis to determine whether a claim of human authorship can be made for output generated using AI (discussed further in section 8.3 below).[223] It is difficult to see how Ramalho's test is any better for legal certainty.

As mentioned above, the UK has recently considered whether to reform its approach to computer-generated works.[224] The UK IPO's consultation on section 9(3) attracted fresh criticism from those who supported reforming it or getting rid of it entirely. Kretschmer, Meletti, and Porangaba called for the

218. Sam Ricketson, *supra* note 152, at 29.
219. Ciani, *supra* note 14, at 282.
220. Dornis, *supra* note 11, at 18.
221. Ramalho, *supra* note 26, at 60.
222. *See id.* at 59–60.
223. *See id.* at 54–55.
224. *See* UK Intell. Prop. Off., *supra* note 10.

removal of the protection provided by section 9(3), unless strong evidence emerged that AI users, developers, and businesses rely on it.[225] Goold also criticized section 9(3), stating that it "is either unnecessary or unjustifiably extends legal protection to a class of works which belong in the public domain."[226] Ultimately, no reform was made, but the UK IPO consultation demonstrates that lawmakers must rethink whether existing regimes still serve their purpose in light of rapid AI developments, and that the flaws in this regime meant it was recognized as needing reconsideration. Unfortunately, the decision not to reform the law also demonstrates the difficulties that lawmakers seem to have with tackling this area, and the lack of appetite to introduce change in an area in which there are considerable uncertainties. The consultation and considered reforms are discussed further in Section 8.4 below.

VI. Protection for Works Generated by AI in the United States

It is worth also briefly examining the law in the United States where, as noted above, copyright law has a constitutional footing. To qualify for copyright protection in the U.S., a work must have been independently created by an author and must display a minimal level of creativity.[227] The standard in the United States was set by the Supreme Court in *Feist Publications, Inc. v. Rural Telephone Service Co*, in which the Court held that copyright protection only applies to "those components of a work that are original to an author"[228] and to meet the creativity threshold all that is required is "a modicum of creativity."[229] However, in *Feist*, the Supreme Court refused copyright protection to a phone directory, commenting that "100 uncopyrightable facts do not magically change their status when gathered together in one place."[230] This is an obvious contrast with the EU's standard set out in *Infopaq*, as the U.S. Supreme Court clearly takes the view "that selection, coordination and arrangement of information is not an act that conveys originality, while the opposite is true across the Atlantic."[231]

Therefore, under U.S. copyright law, some works generated by AI, or computers more generally, are unlikely to be protected, especially if autonomous AI is used, where a human author does not contribute any originality to the work.[232] In *Feist*, the Supreme Court suggested that acts that are "mechanical or routine" in such a way that they "require no creativity whatsoever" will not meet the originality standard.[233] Similarly, the administrative manual of the U.S. Copyright Office, the *Compendium of Copyright Office Practices*, states that the Copyright Office will refuse to register copyright claims for a work

225. *See* Kretschmer, *supra* note 210, at 323.
226. Patrick Goold, *The Curious Case of Computer-Generated Works Under the Copyright, Designs and Patents Act 1988,* 2 Intell. Prop. Q. 120, 120 (2021).
227. *See* Feist Publications, Inc. v. Rural Telephone Service Co., 499 U.S. 340, 345 (1991).
228. *Id.* at 348.
229. *Id.* at 346.
230. *Id.* at 345.
231. Guadamuz, *supra* note 16.
232. *See id.*
233. *Feist*, 499 U.S. 340, at 362.

produced by "a machine or mere mechanical process that operates randomly or automatically without any creative input or intervention from a human author."[234]

Furthermore, U.S. law also seems to assume that an author should be a natural human person, even though the law does not explicitly define authorship. For example, in defining the concept of an anonymous work, the U.S. Copyright Act defines such works as ones where no natural person is identified as the author.[235] Case law further supports the idea that U.S. law implies a requirement for a natural human author. For example, the U.S. Supreme Court has held that copyrightable works must be "original intellectual conceptions of the author."[236] The Supreme Court has also explicitly referred to an author as a "person,"[237] and has ruled that to benefit from copyright protection a work must have "some element of human creativity."[238] In one notorious case of who owned the copyright over photographs taken by a monkey, the Northern District Court of California found that the monkey was not the author and stated that "the Supreme Court and Ninth Circuit have repeatedly referred to 'persons' or 'human beings' when analyzing authorship under the Act."[239]

Moreover, the *Compendium of Copyright Office Practices* explicitly states that the U.S. Copyright Office will only register an original work of authorship created by a human being.[240] This approach is grounded in the U.S. Supreme Court's decision in *Trademark Cases*, where the Court stated that copyright protects fruits of intellectual labor that "are founded in the creative powers of the mind."[241] The requirement for a human author has recently been tested by an application for copyright protection for an AI-generated work of art titled "A Recent Entry to Paradise," which was denied by the U.S. Copyright Office and, following a request for reconsideration, by its Review Board.[242] This was in the context of the voluntary system of copyright registration in the United States, a formality that is not necessary for the subsistence of copyright, but which is required for a copyright holder to be able to enforce their rights.[243]

In the relevant application, the applicant informed the U.S. Copyright Office that he was "seeking to register this computer-generated work as a work-for-hire to the owner of the Creativity Machine," claiming that the work was "autonomously created by artificial intelligence without any creative

234. *See* U.S. Copyright Office, Compendium of U.S. Copyright Office Practices § 313.2 (3d ed. 2021).

235. U.S. Copyright Act 17 U.S.C. § 101 (1976).

236. Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53, 58 (1884).

237. *See* Community for Creative Non-Violence v. Reid, 490 U.S. 730, 737 (1989).

238. Urantia Foundation v. Maaherra, 114 F.3d 955, 958 (9th Cir. 1997).

239. Naruto v. Slater, 2016 U.S. Dist. LEXIS 11041, at *5 (N. D. Cal. Jan. 28, 2016).

240. *See* U.S. Copyright Office, *supra* note 234, at § 306.

241. Trademark Cases, 100 U.S. 82, 94 (1879).

242. *See* Letter from Shira Perlmutter, Register of Copyrights, U.S. Copyright Office Review Board, to Ryan Abbott, Attorney for Steven Thaler, (Feb. 14, 2022) (on file with the U.S. Copyright Office), https://www.copyright.gov/rulings-filings/review-board/docs/a-recent-entrance-to-paradise.pdf [https://perma.cc/B5RG-33BA] [hereinafter Perlmutter]; Jane Recker, *U.S. Copyright Office Rules A.I. Art Can't Be Copyrighted*, Smithsonian Mag. (Mar. 24, 2022), https://www.smithsonianmag.com/smart-news/us-copyright-office-rules-ai-art-cant-be-copyrighted-180979808/ [https://perma.cc/S87T-TB7S].

243. *See* U.S. Copyright Act 17 U.S.C. § 411 (1976).

contribution from a human actor," facts which the Copyright Office accepted.[244] That is to say, neither the Copyright Office nor its Review Board engaged in any assessment of whether or not the work in question was indeed created without any human contribution. Instead, they assessed the application based on the facts presented in the application, taken at face value. The Copyright Office Review Board denied the request on the basis that the work lacked "the human authorship necessary to support a copyright claim."[245]

The Copyright Office also stated that it would not "abandon its longstanding interpretation of the Copyright Act, Supreme Court, and lower court judicial precedent that a work meets the legal and formal requirements of copyright protection only if it is created by a human author."[246] The practices of the Copyright Office are administrative in nature and do not have the power of law, but this nevertheless provides insight into how the law has been interpreted by the Office, and thus how it is currently implemented in practice. The applicant has argued against the decision not to grant the copyright registration, stating that "the human authorship requirement is unconstitutional and unsupported by either statute or case law."[247] The applicant has now filed an appeal with the District Court in Washington, D.C. asking that the Review Board's decision be overturned and that the application be reinstated.[248]

The U.S. Copyright Office has also recently denied copyright protection where an AI system was listed as a co-author (along with a human author), rather than a sole author. The work in question was a painting generated by an AI system named "RAGHAV" after it received instructions and input from a human being named Ankit Sahni.[249] The Copyright Office found that despite Mr. Sahni's assertions that there was human creative input present in the work that was distinct from the AI system's contribution, "this human authorship cannot be distinguished or separated from the final work produced by the computer program."[250] Mr. Sahni, speaking to the publication "Managing IP," pointed out that the refusal was not based on the fact that the AI tool was ineligible to be a co-author, but "the fact that the subject artwork was not one of human authorship and the human contribution could not be distinguished in the final output produced by the AI."[251] However, it follows that if the U.S. Copyright Office will not recognize AI systems as authors and maintains that U.S. law requires a human being to be the author of a copyrightable work, then it is unlikely to recognize an AI system as a co-author.

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244. Perlmutter, *supra* note 242.

245. *See id.*

246. *See id.* (referring to the "[r]efusal of First Request for Reconsideration from U.S. Copyright Office to Ryan Abbott (30 March 2020) at 1-2.").

247. *See id.*

248. Complaint at 18, Thaler v. Perlmutter et al., Case No. 1:22-cv-01564 (D.D.C. filed June 2. 2022).

249. '*US Copyright Office Rejects AI Assisted Painting by Indian Applicant*,' IP News Bulletin (July 4, 2022), https://patentresearch.wixsite.com/ipnewsbulletin/post/us-copyright-office-rejects-ai-assisted-painting-by-indian-applicant [https://perma.cc/679Z-3P9R].

250. Sukanya Sarkar, *Exclusive: US Rejects Copyright Petition Listing AI Co-author,* Managing IP (July 1, 2022), https://www.managingip.com/article/2aauynvuwqni7szvm5s74/exclusive-us-rejects-copyright-petition-listing-ai-co-author [https://perma.cc/4M3E-N8UV].

251. *Id.*

Although, as noted above, that the U.S. Copyright Office is an administrative body and its decisions do not affect copyright law, they nevertheless provide a useful indication of how U.S. law may be interpreted, and they reflect how it operates at a practical level. As in the EU, the presumption that an author must be a natural person poses a significant hurdle for any attempt to assert that autonomously generated AI output should benefit from copyright protection. Of course, questions remain as to how this requirement should be properly assessed in the context of sophisticated AI systems, and whether such systems are yet at a point at which they can be considered fully autonomous. The applicant for copyright protection for "A Recent Entry to Paradise" claimed the AI system was the author of this work and that it had been autonomously created by a computer algorithm, but currently one has no way of knowing if a court (or experts in this field) would agree once it examined the facts and the process of creation.[252]

It is also worth noting that parallels have also been drawn between the "legal fiction" approach to computer-generated works taken in the UK, Ireland, and some other common law jurisdictions, and the "work for hire" doctrine that exists in U.S. copyright law.[253] Under this doctrine, a corporation is considered the legal author of a work which was created by a human employee of the corporation. As this accommodation of non-human authors already exists in the work for hire concept, it has been suggested that maybe it is a "logical place to look for a solution to the problem of computer authors. Maybe we can treat computer-authored works as works made for hire."[254] Hristov suggests that simply reinterpreting the terms "employee" and "employer" in the made-for-hire doctrine would provide a practical solution without "a lengthy or controversial overhaul of the rules and guidelines currently set in place."[255] Bridy points to the UK and other common law countries as jurisdictions in which this is essentially the approach taken, while noting that "civil law countries with a strong moral rights orientation in their copyright systems—for example, France, Germany, Greece, Switzerland, and Hungary—reject the notion of non-human authorship completely."[256] Bridy concludes that as "U.S. copyright law is grounded in the protection of economic rather than moral rights, it's not inconsistent with first principles to recognize authorship in non-natural

252. *See* Eileen Kinsella, *Can A.I.-Generated Art Receive Copyright Protection? U.S. Authorities Say No, Citing a Lack of 'Human Authorship'*, ARTNET (Feb. 23, 2022), https://news.artnet.com/art-world/us-copyright-office-rejects-artificial-intelligence-art-2076830 [https://perma.cc/APA5-QTHN].

253. *See* Annemarie Bridy, *The Evolution of Authorship: Work Made by Code*, 39 COLUM. J.L. & ARTS 395, 400 (2016); RAMALHO, *supra* note 26, at 38.

254. Bridy, *supra* note 253, at 400.

255. *See* Hristov, *supra* note 2, at 431.

256. *See* Bridy *supra* note 253, at 401-02.; *see* Copyright Act 1994, §5(2)(a) (N.Z); *see* Copyright, Designs and Patents Act 1988, c. 48, § 178, (UK); Code de la Propriètè Intellectuelle [C.P.I.] [Intellectual Property Code] art. L113 (Fr.); Ureberrechtsgesetz [Copyright Act], Sept. 9, 1965, Bundesgetsetzblatt at 1, 1273, (Ger.); Nomos (1993: 2121) Pnevmatikí Idioktisía, Sigyeniká Dikaiómata kai Politistiká Thémata, Phíllo Ephimerídos Tis Kiverniseos [Law 2121/1993 on Copyright, Related Rights and Cultural Matters], [PH.E.K.] 1993, A:25 (Greece); Loi Fédérale Sur Le Roi D'Auteur et Les Droits Voisins [LDA] [Federal Acton Copyright and Related Rights] Oct. 9, 1992, SR 231.1 (Switz.); 1999. évi LXXVI. szerzői jogról szóló (Act No. LXXVI of 1999 on Copyright) (Hung.).

persons."[257] Ramalho also recognizes that the works-for-hire concept bears some similarity to the approach taken to computer-generated works in the UK, noting that both concepts are legal fictions.[258]

However, Ramalho points out that the works-for-hire regime cannot accommodate works created by AI systems as they do not necessarily fall under the exhaustive list of categories of committed works set out in the relevant U.S. law, and additionally "the relationship between the creator of the AIs and the AIs does not fit the characterization as commissioner-creator or employer-employee (not least because the employee or agent has legal rights and duties by agreement with the employer/commissioner)."[259] Crucially, the work for hire doctrine does not "escape the inevitable lack of human authorship of AI-generated works," because an "extricable connection to humanness" exists within it - the legal fiction only recognizes a corporation as the author of the work, but the creation of such work is still performed by a human being.[260]

VII. The Way Forward

As demonstrated from the foregoing analysis, there remains a considerable amount of debate regarding, and uncertainty as to, the best way for copyright law to interact with AI-generated works. There are several possible solutions that dominate current scholarship on this issue, and which are examined in detail below.

A. Should Works Generated by AI Systems be in the Public Domain?

One option, and one that features prominently in the scholarship on this topic, is to deny copyright protection to works that are autonomously generated by AI. In such a scenario such works would be deemed to be in the public domain and so could be copied and used without restriction by anyone. This appears to currently be the position in the United States for autonomously generated works, where works like "A Recent Entry to Paradise" are public domain by virtue of the fact that they do not qualify for copyright protection (although there is debate as to whether this is the proper interpretation of the law, it is the view taken by the U.S. Copyright Office, as well as by many scholars).[261]

Some commentators conclude that there are significant benefits to deeming all AI-generated outputs to be in the public domain. One such benefit is that it would avoid the risk of overprotection associated with protecting both an AI system and the works it generates (as discussed above). This would have obvious benefits for those wishing to use such works, in that they would not have to seek permission to use such works and therefore it would also likely reduce their costs, but it may also have benefits for AI service providers. This is because decreasing the protections for works generated by AI could result

257. Bridy, *supra* note 253, at 401.
258. Ramalho, *supra* note 23, at 12.
259. U.S. Copyright Act 17 U.S.C. § 101(2) (1976); Ramalho, *supra* note 23 at 12.
260. Ramalho, *supra* note 26, at 39.
261. Perlmutter, *supra* note 242.

in more utilization of such works because such works would be in the public domain and would therefore be more accessible.[262] If such works are used in a way that requires the services of AI service providers, this may result in increased demand for AI services.[263] Additionally, if such works were no longer protected by copyright they could be used to train AI, which might result in a greater demand for AI.[264]

However, many potential issues may arise if AI-generated works are left to fall into the public domain.[265] The European Parliament's Committee on Legal Affairs has expressed concern that "a failure to protect AI-generated creations could leave the inventors of such creations without rights, as the protection afforded by the system of related rights implies the existence of copyright on the work being interpreted."[266] In its Impact Assessment conducted as part of its consultation on AI and intellectual property rights, the UK IPO also examined this risk, but noted that some respondents to the government's calls for views on the topic had pointed out that AI systems can generate works quickly and at low cost.[267] Therefore, "it is questionable whether economic incentives are needed."[268]

Unfortunately, however, this does not consider whether it is possible to create the AI system quickly or at a low cost and whether the incentive for building the system might lie in the protection of the works it can generate. The example given by Dornis, as noted in Section 4.3 above, of an application for music composition, illustrates the type of economic reality that such arguments oversimplify.[269] This argument also, like the main criticisms of utilitarian justifications for copyright law discussed in Section 4.3 above, overlooks the correlation between innovation and the protection of output, and the fact that society as a whole can benefit from promoting innovation. Not providing copyright protection could have a negative impact on the development of AI and innovation in this field as without protection there is a lack of incentive for developers to create, use, and improve the capabilities of AI systems.[270] This could have what Guadamuz calls a "chilling effect" on investment.[271] While it is still possible that such developers would still find a reason to deploy artificial intelligence in order to handle time-consuming endeavors, on the basis that this would lead to savings in terms of personnel costs, Guadamuz concludes that it is too early to tell if that would be the case.[272]

There are also strong practical reasons that make deeming all AI-generated works to be public domain is not an ideal solution. As speculated by Mr. Sahni (the applicant on behalf of the AI system "RAGHAV", which was denied

262. UK Intell. Prop. Office, *supra* note 10, at 19.
263. *Id.*
264. *Id.*
265. Grubow, *supra* note 21, at 419.
266. European Parliament Committee on Legal Affairs, Report on "Intellectual Property Rights for the Development of Artificial Intelligence Technologies" (2020).
267. UK Intell. Prop. Off., *supra* note 10.
268. *Id.*
269. Dornis, *supra* note 5, at 26.
270. Hristov, *supra* note 2, at 438.
271. Guadamuz, *supra* note 12.
272. *Id.*

copyright protection in the United States as discussed above), not providing copyright protection to works generated with the assistance of AI creates a risk that works created by AI systems could be falsely asserted to be the sole output of a human individual in order to obtain copyright registration.[273] Commentators in this field have also pointed out this risk.[274] Although it has been noted that it is not yet clear whether this will be a serious problem in practice, one can certainly conclude that denying copyright protection to autonomously AI-generated works creates an incentive for this sort of concealment. Given the private nature of the output-producing process, it seems unlikely that it will be possible to avoid this risk or adequately address it in practice. Furthermore, incentivizing such concealment is likely to cause a loss of public information, which in turn will slow down the AI innovation cycle.[275]

Ultimately, the conclusions reached in Section 4.3 above are relevant to this discussion and support the idea that sending all AI-generated works to the public domain is not adequately supported by the main theories underpinning copyright law, especially from an economic perspective. Nor is it a solution that is likely to have desirable practical consequences. Providing at least some level of protection, such as a neighboring or related right, stands out as a solution that offers a way to find a balance between the competing positive and negative consequences discussed above. This will be explored further in Section 8.5 below.

B. Should AI Systems be Recognized as the Authors and Owners of What They Create?

It may also be argued that if AI-generated works qualify for copyright protection, then AI systems themselves should own those rights. Certainly, there has been and continues to be debate around the concept of granting legal personhood to AI systems, which would be necessary in order for the systems to own rights. Indeed, in the UK IPO's recent consultation on AI and intellectual property rights, it was noted that many respondents felt that it is necessary to undertake a broader ethical and moral debate on whether AI should be recognized as a legal personality. However, the IPO concluded that "[t]his is not a problem which can be resolved in IP law."[276] The topic was therefore deemed to fall outside the scope of that consultation, and similarly, it is broader than the topic of this thesis. However, it is worth making a brief note here about how this debate affects the matter of copyright in AI-generated works.

Firstly, it must be stated that awarding legal personhood to AI systems remains controversial. A past proposal by the European Parliament to create electronic personhood for intelligent robots was heavily criticized.[277] As long

273. *US Copyright Office Rejects AI Assisted Painting by Indian Applicant*, IP News Bulletin (July 4, 2022), https://patentresearch.wixsite.com/ipnewsbulletin/post/us-copyright-office-rejects-ai-assisted-painting-by-indian-applicant [https://perma.cc/GBN2-8TKG].

274. Hugenholtz & Quintais, *supra* note 125, at 1200.

275. *Id.*; Dornis, *supra* note 11, at 39.

276. UK Intellectual Property Office, Consultation Outcome: Artificial Intelligence and Intellectual Property: Copyright and Patents (2022).

277. Nathalie Nevejans, *European Civil Law Rules in Robotics,* Study for the JURI Committee, Policy Department for Citizens' Rights and Constitutional Affairs 14 (2016).

as this remains just a proposal, "[a]warding intelligent agents with copyright ownership is not and will not be a viable solution."[278] In the U.S., there are also clear challenges to the notion of granting AI systems legal personhood and awarding them with copyright ownership in authorship. For example, if AI systems can have legal personhood, or if they can have any legal rights, it follows that they should also have legal responsibilities, and U.S. case law has established that animals, and by extension non-humans, cannot be held legally responsible before a court, as they are not natural persons.[279] The U.S. Copyright Office also makes it clear that its interpretation of the law is that non-humans cannot be authors, as discussed above.[280] Therefore, in a U.S. context, Hristov argues that redefining copyright to include non-human authors, such as AI systems, would undermine the legal system, and raise more questions than answers.[281] Guadamuz goes as far as to suggest that it is "highly unlikely that we will witness and deviation away from personhood as a requirement for ownership, and we are not to witness any sort of allocation of rights towards machines."[282] Furthermore, even if AI systems were to be granted legal personhood, it does not necessarily follow that works generated by such systems should automatically benefit from copyright protection.

C. Should Authorship in Works Generated by AI be Attributed to Human Beings (the Owners, Programmers or Users of AI Systems)?

A regime granting copyright protection to AI-generated works and recognizing AI owners, programmers or users as authors is one option. This approach would be consistent with utilitarian justifications of copyright law, in that, if formulated correctly, it could provide an economic reward to those who invest their efforts in creating artistic works, and "giving exclusive rights to AI programmers and owners would work as an incentive to the future development of the AI industry."[283] In the United States and UK in particular, utilitarianism plays a more pronounced role in the justifications for copyright law than in the EU.

It is important to note here that the topic in issue is copyright in works *autonomously* generated by AI systems. Here, adopting scales of autonomy is not helpful, although it is the approach favored by some commentators and used as the basis to look for human involvement in the creative process, so as to ground a claim of human authorship.[284] On this basis, Ramalho suggests a three-step test to be used on a case-by-case basis, starting with "tracing the human intervention in the creative process, which can be identified at the different stages of producing a work (namely, the preparation, execution, or final stage)."[285] The second step involves assessing whether the human intervention

278. Ciani, *supra* note 14, at 281.
279. Naruto v. Slater, 2016 U.S. Dist. LEXIS 11041, at *5 (N. D. Cal. Jan. 28, 2016).
280. U.S. Copyright Office, Compendium of U.S. Copyright Office Practices §306 (2021).
281. Hristov, *supra* note 2, at 441.
282. Guadamuz, *supra* note 16.
283. Ciani, *supra* note 14, at 283.
284. Ramalho, *supra* note 26, at 54; Guadamuz, *supra* note 12.
285. Ramalho, *supra* note 26, at 54.

is enough of an original contribution to justify copyright protection attaching to the work, and the final step is whether the creativity of the author is reflected in the final work produced.[286] Ramalho explains that "[t]he crux of the matter is again assessing whether the human intervention is worthy of copyright protection due to its creative proximity to the final version of the work, regardless of the stage of the creative process where it takes place."[287]

Such case-by-case approaches clearly retain a focus on human involvement and thus what they call for is in essence simply a considered application of the existing law to the AI output generating process. In the type of case-by-case approach summarized above, works in which there is not sufficient human involvement would not benefit from copyright protection at all and would thus be in the public domain.[288] Therefore, the result is that output autonomously generated by AI systems would be in the public domain. However, the important issue that requires closer analysis is whether such autonomously generated output should in fact benefit from protection. With such fully autonomously generated works, there is no question of scale or point in searching for human intervention, as there is a break between the output-producing process and any human creativity - the AI system acts "as an independent and autonomous 'actor,' emancipated from human direction and supervision."[289]

Turning then to the question of whether such autonomously generated works should benefit from copyright protection, the debate in this area encompasses the considerations set out in Section 4.3 above. In summary, it is difficult to conclude that utilitarian perspectives justify withholding protection from autonomously AI-generated output, given the role that protection plays in encouraging innovation and production. There are concerns grounded in natural law perspectives that carry more weight in justifying a denial of protection, in particular, in relation to the personality theory given the clear lack of human personality in an AI-system. However, as outlined in Section 5.2 above, there is already consensus regarding moving towards recognizing creativity based on the output rather than the creative process. Additionally, it can be observed that "intellectual property law has become increasingly orientated towards the results of economic value of creativity and innovation" and although the author remains at the center of copyright law, changes have taken place to protect "technical, organizational, and economic accomplishments and value."[290] This movement towards a focus on economic value favors the idea of recognizing copyright in AI-generated works. In any case, even the personality theory does not justify outright protection of any kind, and as will be explored further below, the introduction of a neighboring right (rather than full copyright protection) could offer a solution capable of striking the appropriate balance. Ultimately, without reliable data that supports the concerns associated with granting protection to AI-generated output, the better arguments are those in favor of protecting such works.[291]

286. *Id.* at 55.
287. *Id.*
288. *Id.* at 57.
289. Dornis, *supra* note 11, at 39.
290. Dornis, *supra* note 5, at 28.
291. *Id.* at 39.

If copyright (or related rights) is to be recognized in output generated autonomously by AI, the next question is whether a human developer or user should be the owner of those rights. Given the difficulties discussed above with the concept of AI systems holding such rights, this approach is preferable and aligns more closely with existing law and practice. However, as discussed above in relation to the UK's current approach, there are likely to be difficulties in identifying whom the appropriate human being to deem to be the author or owner of the rights is.

Where copyright protection is to be granted to output autonomously generated by AI, a legal fiction akin to that used in the work-for-hire doctrine in the U.S. is required in order to deem a human being the author. Such a fiction is required because, unlike in the three-step approach Ramalho proposes, the human being has not actually intervened in the creative process. The developer of the AI system may seem like an obvious candidate for such authorship, especially from the point of view of economically incentivizing innovation in AI. However, this won't always be appropriate from a practical perspective, given that "any transfer or dissemination of the AI software and apparatus would lead to a divergence of ownership of the AI-generated products as such and ownership of the neighboring rights in these products," which would cause difficulties if there were successive sales of the AI system and would also lead to issues with the enforcement of rights.[292] Furthermore, it can also be argued it is not the programmer, or even the user, of an AI system that is in fact responsible for determining the amount of output it generates, but the person who determines the utilization of the system - likely to be the hardware owner and software licensee.[293]

In relation to the British regime for computer-generated works, the UK IPO has recognized that the person who undertakes the arrangements necessary for the creation of the work (the authorship criteria under this system) will often not be the developer of the AI software, but suggests that instead it may be the person who inputs parameters into the software to generate output.[294] However, it is not clear that this captures the distinction between a user who inputs the parameters in practice, and the person with the power to determine what those parameters are, when they will be input and who generally has the power over the use of the AI system. The important distinction is that the user may not always be the person who needs to be incentivized, given that, as Dornis points out, they will often be acting "on behalf of or as an employee of the owner-licensee" of the system, and "[w]hat matters with respect to incentivizing the production of emergent works is the power of disposition over the AI's production activities."[295] This approach, which may be considered somewhat analogous to the work-for-hire system in the U.S., makes sense from an incentivization perspective, is also consistent with the idea of using copyright to reward investment or labor, and avoids practical difficulties such as those noted above.

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292. *Id.*
293. *Id.* at 48-49.
294. UK Intell. Prop. Off., *supra* note 10.
295. Dornis, *supra* note 11, at 53.

D. The UK's Recent Consultation on Protecting AI Generated Works

As discussed above, the UK and other jurisdictions such as Ireland, an EU member state, do have a regime to grant authorship of a work generated by a computer to the human being responsible for the arrangement of that computer program. Guadamuz describes the UK approach as efficient and suggests it could be used elsewhere, arguing that "granting copyright to the person who made the operation of artificial intelligence possible seems to be the most sensible approach" given that it "will ensure that companies keep investing in the technology, safe in the knowledge that they will get a return on their investment."[296] As noted above, the protection offered by this regime is not identical to that offered to works generated by human beings (and so may not be considered akin to a true authorial copyright) given that it does not include moral rights and has a limited term of protection.[297]

Although this approach appears on its face to offer more certainty for AI-generated works than the more obvious legal void in the EU and United States, is in fact far from offering a clear solution. As the analysis of this type of regime above demonstrated, this was not a solution designed with AI systems that could act autonomously in mind. In the UK, the IPO recently engaged in a reconsideration of the law in this area by running a consultation titled "Artificial Intelligence and Intellectual Property: Copyright and Patents" from October 2021 until January 2022.[298] This Consultation sought evidence and views on three areas, one of which was on the following topic: "Copyright protection for computer-generated works without a human author. These are currently protected in the UK for 50 years. But should they be protected at all and if so, how should they be protected?"[299] The consultation provides useful perspectives on the differing views in this area.

As examined above, currently section 9(3) of the Copyright, Patent and Design Act in the UK provides that in the case of computer-generated works, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken.[300] In the Consultation, the IPO asked for views on whether this section should remain unchanged, or be removed, so that works generated by a computer would not be protected by copyright, or whether it should be replaced with a new right of reduced scope and/or duration.[301] The Consultation stated that the government would choose a new duration with the aim of reflecting the effort or investment that is put into creating the relevant works, noting arguments that the current term of protection of 50 years is too long.[302] The Consultation used five years as an example of what this new term of protection could have been, noting that the new duration would aim to reflect the fact that computers have the capacity to generate work quickly, without much effort or human input.[303]

296. Guadamuz, *supra* note 16.
297. Dornis, *supra* note 5, at 2.
298. UK Intell. Prop. Off., *supra* note 10.
299. *Id.*
300. Copyright, Patent and Design Act 1988 c. 4, §9(3) (UK)
301. UK Intell. Prop. Off., *supra* note 10.
302. *Id.*
303. *Id.*

The Consultation also stated that "[t]he term should be no longer than is needed to encourage the production of AI-generated works. A shorter term of protection would allow third parties to benefit from free use of the work once the protection had expired earlier than the current 50-year term."[304]

However, after considering the responses to the Consultation, the IPO decided not to implement any changes to the law. It found that there is currently no evidence that the protection provided to computer-generated works is harmful. It also noted that "the use of AI is still in its early stages. As such, a proper evaluation of the options is possible, and any changes could still have unintended consequences."[305] However, the IPO did state that it would keep the law under review, and if in future there is evidence to support amending, replacing or removing protection then this could be done.[306]

The UK's Consultation found that most respondents agreed that protection for computer-generated works does not seem to be widely used at present, and there was little evidence to support claims to the contrary.[307] It is worth noting that it seems the primary motivation for not removing the protection is the fact that there is no evidence it causes harm, yet it seems safe to assume that the reason for this is because it does not seem to be currently used very much. The prevailing view in the Consultation seems to have been that as the long-term implications of removing protection are unclear, removing it would damage legal certainty, whereas leaving it unchanged offers stability.[308] The UK IPO bemoaned the difficulties in quantifying any likely impact of implanting new policies regarding AI and intellectual property rights. This is compounded by a lack of useful data regarding current and future AI development and use and uncertainty regarding to what extent AI contributes to creative works.[309]

Unfortunately, the majority of the respondents, and the UK IPO, seem to have simply sided with the view of retaining the protection simply because it already exists. The argument that removing the protection would remove legal certainty is weakened by the fact that the respondents agreed that the provision is not heavily relied on at present, and there is only one piece of case law that deals with it.[310] Therefore, surely the implications of retaining the protection are also not clear at this point, and so one struggles to find this alone to be a satisfactory rationale for retaining the protection. Citing lack of certainty as a reason for not changing the law is also disappointing considering that one of the reasons for the Consultation was to address the perceived lack of clarity around the law regarding computer-generated works.[311]

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304. *Id.*
305. *Id.*
306. *Id.*
307. *Id.*
308. *Id.*
309. UK Intell. Prop. Office, *supra* note 10, at 12.
310. *Id.* at 10; Nova Productions Ltd. v. Mazooma Games Ltd. [2006] RPC 379 (UK).
311. U.K. Intell. Prop. Off., *Government Response to Call for Views on Artificial Intelligence and Intellectual Property* (Mar. 23, 2021), https://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 [https://perma.cc/5G6K-D8LK]; UK Intell. Prop. Off., *supra* note 10.

Therefore, it seems that for now, the lack of clarity and certainty regarding this will continue.[312]

Those who supported removing the protection argued that it was neither necessary nor beneficial, and raised concerns regarding the lack of clarity around how the concept of originality works in this context (as was discussed above).[313] Concerns regarding the ability of AI systems to generate a large number of works and the resulting risk of crowding-out human-created works were also noted.[314] Many respondents to the Consultation conceded; however, that as AI develops this may need to be revisited as alternative approaches could become suitable.[315]

The final option presented in the Consultation was to replace the protection for computer-generated works with a new right of reduced scope or duration. The respondents who supported this option argued that "a new right could be crafted to incentivize investment in AI, while still promoting human creativity."[316] However, many of those respondents recognized that more evidence is needed in order to determine what the scope and duration of this new right should be.[317]

A clear theme emerging from the Consultation outcome is the fact that there still exists uncertainty as to how the interaction between AI-generated output and copyright will interact in future, and what the best approach is (indeed this uncertainty seems to be what motivated support for the retention of the status quo). In fact, the UK IPO noted the uncertainty that exists as to the impact changing the law would have while also reporting a lack of evidence as to how the law is currently used and the impact, if any, that it has.[318] There remains a need for further research as AI develops, and close monitoring of developments in this space is essential to ensure that the legal landscape responds appropriately. However, for now, the issues with the British regime, including in particular the confusion about originality requirements and how the person by whom the arrangements are undertaken is to be identified, remain.

E. Is the Recognition of Neighboring Rights or Similar an Alternative Way Forward?

There have been calls for the introduction of specific neighboring rights to provide alternative protection for AI-generated works.[319] Compared to copyright, such rights could arguably take better account of the type of creativity

312. Toby Bond, *UKIPO Proposes New Permissive Exception for Commercial Text and Data Mining in the UK*, BIRD&BIRD (June 28, 2022), https://www.twobirds.com/en/insights/2022/uk/ukipo-proposes-new-permissive-exception-for-commercial-text-and-data-mining-in-the-uk [https://perma.cc/9XFP-XGWH].

313. UK Intell. Prop. Off., *supra* note 10.

314. *Id.*

315. *Id.*

316. *Id.*

317. *Id.*

318. *Id.*

319. Martin Senftleben & Laurens Buijtelaar, *Robot Creativity: An Incentive-Based Neighboring Rights Approach*, 42 Eur. Intell. Prop. Rev.797, 798 (2020); Ana Ramalho, *Will Robots Rule the (Artistic) World? A Proposed Model for the Legal Status of Creations by Artificial Intelligence Systems*, 21 J. Internet L. 1, 2 (2017).

that exists in AI-created works, and in the EU this approach may be more consistent with existing regulation and policy and preferable to changing the features of copyright law so as to specifically account for AI.[320] In fact, in the EU, it is already possible that some AI-generated works could benefit from some related rights protection, although this has been described as "holey at best," given that, for example, many related rights are either very limited in their scope or require human contribution (such as in the case of performers rights, where it is implied that a performer must be a human actor).[321]

Arguing in favor of introducing a new neighboring or related right, Ramalho astutely states that a work being in the public domain "does not mean that free access is ensured; free access and free use are not interchangeable notions."[322] She argues that although AI systems may not need to be incentivized or rewarded (by copyright) for generating work, someone who disseminates such work, thereby making it public, will need such incentive or reward, similarly to how publishers of public domain books expect readers to pay for those books.[323] Therefore, a neighboring right could function as such as an incentive or reward for dissemination.

Many commentators have noted that introducing any new right will require careful consideration, including analysis of how it might impact upon other policy areas and empirical studies to determine whether incentives will be needed to encourage the dissemination and commercialization of AI-generated works.[324] Ciani has argued that a new neighboring right should be introduced, and should be a right that is "shaped in full awareness of the existing and potential state of AI, after a careful comprehension of the various degrees of automation that may characterize the domain of computer-generated creativity."[325] This conclusion is an appealing one, but, as seems to be a common theme, when it comes to considering the best legal approach in this area, it depends on further research that is not yet forthcoming. It is not yet clear how possible it is for one to achieve full awareness of the potential state of future AI or for agreement to be reached on what this might be.

More specific solutions that have been suggested include establishing a regime similar to the one that exists for the protection of producers or broadcasters or granting a *sui generis* right in works generated by AI, similar to the right that exists for databases in EU law.[326] For example, the World Intellectual Property Organization (WIPO), has queried whether a *sui generis* system of protection (offering a reduced term of protection and other limitations, potentially somewhat like the British regime) should be introduced for copyrights in original literary and artistic AI-generated works.[327]

320. Ciani, *supra* note 14, at 283.
321. Dornis, *supra* note 5, at 9-11.
322. Ramalho, *supra* note 26, at 63.
323. *Id.*
324. *See, e.g.*, *id.* at 64.
325. Ciani, *supra* note 14, at 283.
326. Ramalho, *supra* note 26, at 63.
327. WIPO Conversation on Intellectual Property and Artificial Intelligence, Second Session, Draft Issues Paper on Intellectual Property Policy and A.I. 5 (2019).

However, the First Evaluation Report of the Database Directive reported that the economic impact of *sui generis* rights for databases is unproven, and the right has in fact led to "considerable legal uncertainty." [328] This uncertainty is of note, given that in relation to AI and intellectual property rights, the European Parliament has explicitly noted the importance of creating legal certainty, which appears to be considered alongside, and seemingly interlinked with, "building the trust needed to encourage investment in these technologies and ensure their long-term viability and use by consumers."[329] The Second Evaluation Report reiterated the lack of any proven increase in the production of databases and also noted the right remained unused as a licensing tool.[330] This has been taken to suggest that it does not play a strong role in investment.[331]

Furthermore, the practical difficulties that would accompany the introduction of any new right or regime, particularly in an international context, cannot be ignored. Ramalho notes that given the increasing rate of globalisation, particularly in the field of AI, forming "legislative silos with different regimes for protecting (or not) AI-generated works seems counter-productive."[332]

Additionally, the introduction of a neighboring or related right would not entirely solve the issue of incentivizing concealing the role of autonomous AI in producing output. If human-generated output were to benefit from a higher level of protection (under copyright) than AI-generated output, this incentive would remain. However, the incentive is likely to be reduced compared to a scenario where autonomously generated AI-generated output is deemed to be in the public domain. There would likely also need to be other incentives put in place to prevent such concealment. For example, a labelling requirement or, more practically, a disclosure obligation whenever the right is asserted (with resulting forfeiture of the right if any failure to disclose is uncovered).[333]

Ultimately, neighboring or related rights that offer some protection without the full scope of copyright appear to offer the most appropriate solution. There are, however, many intricacies that need to be worked out in order to determine the form and scope of such a right, or in the case of the British regime, how to reformulate and clarify the existing right. This includes how to identify the appropriate human owner of the right, which would be subject to the same considerations and difficulties as identifying the appropriate human owner of copyright if AI-generated output were granted copyright protection (as discussed in Section 8.3 above). It is clear from the above analysis of the

328. *European Commission DG Internal Market and Services Working Paper "First Evaluation of Directive 96/9/EC on the Legal Protection of Databases,"* Europa (Dec. 12, 2005) https://ec.europa.eu/info/sites/default/files/evaluation_report_legal_protection_databases_december_2005_en.pdf [https://perma.cc/NE7M-WURF].

329. European Parliament, Resolution of 20 October 2020 on Intellectual Property Rights for the Development of Artificial Intelligence Technologies, at ¶6, EUR. PARL. DOC. 2020/2015(INI) (Oct. 20, 2020).

330. *European Commission Staff Working Document "Evaluation of Directive 96/9/ EC on the Legal Protection of Databases*," at 17-19, SWD (2018) 147 final (Apr. 25, 2018).

331. Ramalho, *supra* note 26, at 65.

332. *Id.* at 64-65.

333. Dornis, *supra* note 11, at 58.

British regime that the formulation based on "arrangements" in that system is not adequately clear and would benefit from clarificatory reform.

Another issue that would need to be determined is the length of the term of protection, which should ideally be for a shorter period than full copyright protection offers. As the UK IPO has recognized, the term of protection "should be no longer than is needed to encourage the production of AI-generated works."[334] The UK's protection of computer-generated works (which as noted above, can be considered more akin to a *sui generis* protection than full copyright) currently runs for a term of 50 years. However, the UK IPO's recent consultation contemplated shortening this, suggesting a dramatically shorter period of five years. The vast difference between five- and fifty-years hints at concerns that fifty years is likely to be too long a term of protection to strike the right balance. Dornis points out that "the general critique of overlong protection periods in copyright law counsels implementing a period significantly shorter than twenty-five years" and suggests that the most appropriate example might come from the fifteen-year period of protection afforded to databases in the EU.[335]

Conclusion

Currently, copyright law in the EU, and as well as in the U.S. and in the UK, requires human involvement in creating a work in order for the work to benefit from copyright protection. Although an exception for computer-generated works exists in the UK there is uncertainty regarding how originality requirements can be satisfied in the context of this regime, how the relevant human author should be identified, and how it is actually used in practice.

Inaction on the part of lawmakers is disappointing, and it is likely to be only a matter of time until cases on the issue of copyright in AI-generated output come before the courts. This could be, for example, because an infringement case is defended by arguing that the work in issue is not protected by copyright because it was autonomously produced by an AI system.[336] This is therefore a topic that needs to be addressed sooner rather than later. If further research and evidence is needed, as the UK IPO suggest, then it is time to embark on the work needed to obtain that.

As the above analysis has shown, the theories used to justify legal systems of copyright protection cannot be used to deny any level of protection to output autonomously generated by AI. A carefully and thoroughly formulated neighboring right offers a solution that could balance the competing considerations at play. The existing legal uncertainty does not encourage investment, innovation, or the sharing of knowledge. If law and policymakers are serious about encouraging innovation and development in the field of AI, reform is needed.

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334. UK Intell. Prop. Off., *supra* note 10.

335. Dornis, *supra* note 11, at 57; Directive 96/9, art. 20, 26, 1996 O.J. (L 77) 20; *see also* William M. Landes & Richard A. Posner, *An Economic Analysis of Copyright Law,* 18 J. Legal Stud. 325, 361 (1989) (critiquing overly long terms of protection).

336. Guadamuz, *supra* note 6.