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Copyright in works created by artificial intelligence between creativity and investments

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Introduction

Artificial intelligence has captured the attention of copyright lawyers fascinated by the thought of machines creating works of art, music and literature. There is no doubt that, as has often happened in the past during previous waves of technological advances, AI platforms—and especially, machine learning—have brought with them new opportunities as well as challenges. Machine learning is an AI application enabling programs to learn and progress automatically from experience. Its main feature is accessing data and often using it for the purpose of creating outputs, including music, literature, movies and art. Amounts of data are observed and analysed by the machine, which enables the latter to learn and then make creative decisions leading to final outputs that, as precise works of art, are often not foreseeable by the people who developed and started the initial program. Such a process is characterised by the absence of substantial human intervention or assistance after the program is operated, and by the use of algorithms—namely a sequence of instructions aimed at solving a problem or performing a computation. This can be labelled "algorithmic creativity", i.e. the way by which AI creates new works.

There is no doubt, therefore, that AI technologies are capable of creating tangible and intangible outputs. If such musical, literary and artistic expressions were created by humans, no one would object to them being considered as copyright works. AI-created works are certainly capable of captivating an audience and stimulating emotions in a similar fashion to works of music, literature or art produced by human beings;[1] some AI-created works have even been accorded an economic value in the art market.

Yet, as machines have learned to mimic human creativity, the copyright world has accordingly entered into an AI-driven uncharted territory.[2] Whether AI-generated works can be protected

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[1] Grubow J, "O.K. Computer: The Devolution of Human Creativity and Granting Musical Copyrights to Artificially Intelligent Joint Authors" (2018) 40 Cardozo Law Review 409 (noting, with specific reference to music, that "AI learns the notes, rhythms, and other musical elements of each work, it assigns weights to them until it can accurately predict subsequent notes and rhythms within a genre. Each note output is a subsequent input for generating a musical phrase. The weights, linked to specific neurons and layers of the neural network, resemble human emotions when we hear music we like – chemical interaction between two neurons fire, triggering the release of pleasant-feeling hormones..

[2] It is also worth noting that many algorithms are trained using human labour - Tubaro, P, Casilli, A and Coville, M, "The Trainer, the Verifier, the Imitator: Three Ways in Which Human Platform Workers Support Artificial Intelligence." (2020) 7 Big Data & Society 1.

by copyright is doubtful in several jurisdictions, largely due to the existence of core substantive criteria (such as originality and authorship) which have traditionally been associated with human creativity. Indeed, there is no scholarly consensus on whether copyright—still anchored to romantic views focused on the centrality of the human author—is an appropriate framework to regulate machine-produced output in the first place.

In this chapter we consider the way copyright laws in key jurisdictions (including the US and EU) deal with AI-generated works at present. We also examine the UK's legislation on point— the world's first copyright provision specifically designed to address the advent of (and encourage investment in) computer generated works [3] —before considering alternative solutions, such as leaving AI-generated output in public domain; or introducing a new, narrow and time-limited *sui generis* right which aims to strike a fair balance between incentivising investment in AI and the need to safeguard human creativity.

Authorship, originality and the need for human involvement

The question of "who is the author" of the final machine generated output(s) is crucial because under most copyright regimes around the world the author of the work is also the first owner of the copyright.[4] Traditionally, authors have (inevitably) been human, and copyright's rationales for recognising, rewarding and incentivising creativity through intellectual property have human authors in mind. By contrast, AI enables programmers and/or users (who might turn into authors and artists in their own right) to use a system that is self-contained enough in key decision-making abilities to operate autonomously. [5] Therefore, one could argue that automation in this field—in the form of a machine takeover of the creative process from humans—is antithetical to the concept of authorship underpinned by copyright.

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[3] House of Lords Debate, Hansard, "Copyright, Designs And Patents Bill Hl" (Volume 489: debated on Thursday 12 November 1987), available at <https://hansard.parliament.uk/Lords/1987-11-12/debates/9b959a7b-172a-4e28-8676-1a6747b0f370/CopyrightDesignsAndPatentsBillHl> accessed 15 September 2021.

[4] Ownership gives the author exclusive rights, e.g. in relation to sales, licences or other forms of control of the work.

[5] Bridy A, "The Evolution of Authorship" (2016) 39 Colum. J. L. & Arts 395, 395. That machines can be truly creative and autonomous is not unanimously accepted. Several commentators stress that human beings must still be considered in control of the whole AI generative process; see, for example, Ginsburg and Budiardjo, "Authors and Machines" (2018) 34 Berkeley Technology Law Journal 343, 344, 401–405 (noting that "[n]o machine is itself a source of creativity" and that every action of a machine is "the product of the precise articulation of commands by a human programmer or machine operator". These authors believe that today's generative machines are at best "faithful" and "obedient" agents of the humans who interact with them, and that execute specific instructions from them. A similar view is voiced by Hedrick, "I Think, Therefore I Create" (2019) 8 NYU J. Intell. Prop. & Ent. L. 324, 365, arguing that "there are human programmers and users who write the algorithm's code, set the objective functions and other parameters of the algorithm, and decide whether the algorithm is creating the desired outputs or whether it ought to be tweaked. These humans are masterminding the creative process; even complex AI models are simply following the humans' commands (or at least creative guidelines, criteria, and rules)" (p.332). Hedrick also argues that "[e]ven when an algorithm generates something H-creative ('historically creative' i.e., never before created by humans), such creativity is the result of the instructions and capabilities programmed by its creator and is therefore dictated by the (creative) choices of the programmer or user" (p.339). She further notes that "[the] programmer or user therefore "superintends" and "masterminds" the work of the algorithm, providing it with parameters that guide its functionality and data that determines its trajectory" (p.353); and that "algorithms can be programmed to exhibit apparent creativity as the result of built-in randomness and other rules, including commands to break certain rules in order to create more unique works. However, that creativity is still the result of those rules and of the creative choices made by the programmer and the user" (p.359).

The requirement for authors/artists to be human is an assumption common in many copyright regimes.[6] This principle is enshrined in international treaties such as the Universal Declaration of Human Rights and the International Covenant on Economic, Social and Cultural Rights. The former states that "everyone" has the right to benefit from the protection of the moral and material interests resulting from their works (Art. 27 UDHR; Art. 15 ICESCR). The word "everyone" clearly suggests a human element. Furthermore, several national laws in Europe limit authorship to natural persons. Spanish law, for example, provides that the author is the natural person creating the work;[7] French law suggests that only a natural person can be the author;[8] and German law provides that copyright protects the author in his or her intellectual/personal relationship to the work.[9]

Likewise, although there is no specific human authorship requirement in the US Copyright Act,[10] in the Compendium of its practices the US Copyright Office emphasises the importance of the human element in the creative process; indeed, it only registers an original work of authorship "provided that the work was created by a human being".[11] The US Copyright Office is even clearer when it comes to works generated by new technologies: "the Office will not register works produced by a machine or mere mechanical process that operates randomly or automatically without any creative input or intervention from a human author".[12] Despite these provisions do not have a binding effect,[13] they nonetheless demonstrate that the US copyright system takes an unfavourable view towards protecting AI- and machine-created works via copyright. This attitude has been visible since the early days of computer technological advance. When in 1956 the US mathematicians Martin Klein and Douglas Bolitho tried to register the computer-generated song "Push Button Bertha", the US Copyright Office refused the registration, adding that no one had ever registered music created by a machine;[14] and in 1964 the same office refused to register a design for a tile floor because it had been produced by a machine using random geometric patterns, asserting that the design did not constitute the

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[6] Ricketson S, "People or Machines: The Berne Convention and the Changing Concept of Authorship" (1991–1992) 16 Colum. J. L. & Arts 1, 8 and 11 (adding that "[t]here must still be evident some human contribution to the form of the work for which protection is claimed. To put it crudely, the work must not be generated by a machine or be the result of some organized industrial undertaking wherein it is impossible to identify an individual human creator or creators").

[7] See Ley 22/11 sobre la Propiedad Intelectual de 1987, Preambulo: "los derechos que corresponden al autor, que es quien realiza la tarea puramente humana y personal de creacion de la obra y que, por lo mismo, constituyen el nucleo esencial del objeto de la presente Ley."

[8] French Code de la Propriété Intellectuelle art.L112-1. The French Code of intellectual property defines copyrightable subject-matter as "oeuvres de l'esprit".

[9] German Copyright Act (Urheberrechtsgesetz, UrhG) art.11.

[10] This was confirmed by a dictum in Urantia Foundation v Maaherra, 895 F. Supp. 1337 (D. Ariz. 1995) at [957] (dealing with copyright in a work supposedly created by celestial voices).

[11] Compendium of U.S. Copyright Office Practices §101 3rd edn (2017), p.306.

[12] Compendium of U.S. Copyright Office Practices §101 (2017), p.313.

[13] The Compendium of US Copyright Office Practices is a manual published by the Office, used by staff as a guide to the Office's policies and procedures.

[14] See Bridy A, "The Evolution of Authorship" (2016) 39 Colum. J. L. & Arts 395, 395–397.

"writing of an author".[15] A similar outcome was reached more recently by the Australian courts. In *Acohs Pty Ltd v Ucorp Pty Ltd*, the Federal Court of Australia considered that the underlying HTML code for information sheets generated by a computer program did not have any author, and therefore could not be protected by copyright.[16]

What about Europe? Under European Union (EU) law there is no explicit authorship requirement; the concept of authorship in EU copyright law is linked to the originality requirement. In *Infopaq*, the latter has been interpreted by the Court of Justice of the European Union (CJEU) as requiring the work to be the "author's own intellectual creation".[17] And n *Painer*, the CJEU clarified that an intellectual creation is an author's own if it reflects her personality.[18] This would be the case, the court added, if the author were able to express free and creative choices, i.e. a "personal touch". This suggests that the originality requirement involves some degree of human authorship. This point is reinforced by a remark by Advocate General Trstenjak in his Opinion in *Painer*: "only human creations are … protected".[19] This statement does not bode well for the proposition that works created by a machine should be considered original and therefore copyright; rather, the view of AG Trstenjak confirms the personal and anthropocentric nature of the EU copyright regime—a characteristic embedded within the civil law countries of continental Europe that have historically focused on the *droit d'auteur* approach to authorship as emblematic of human creativity and personality.

Adopting an objective originality standard—a futureproof solution?

Generally, the originality requirement may be framed either subjectively or objectively.[20] Under the former approach, the emphasis is on the author's intent to create an original work. This assessment focuses on their personal characteristics, choices and subjective feelings. In contrast, objective originality is more concerned with the audience's perception of the final result. This latter approach is based on an external, general (common) standard of human creativity and intellectual potential (as opposed to the process itself).[21] The CJEU's originality standard, for instance, and its emphasis on the creativity involved in producing the work (the author must stamp the work with a "personal touch" which reflects their free and creative

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[15] US Copyright Office, Register of Copyright, 67th Annual Report of the Register of Copyrights (1964), pp.7–8; see also Hedrick, "I Think, Therefore I Create" (2019) 8 NYU J. Intell. Prop. & Ent. L. 324, 365.
[16] *Acohs Pty Ltd v Ucorp Pty Ltd* [2012] FCAFC 16.
[17] Infopaq International A/S v Danske Dagblades Forening (C-5/08) EU:C:2009:465; [2012] Bus. L.R. 102 at [35].
[18] Painer v Standard Verlags GmbH (C-145/10) EU:C:2011:798; [2012 E.C.D,R. 6] at [88].
[19] Painer v Standard VerlagsGmbH, Opinion of A.G. Trsteniak (12 April 2011) (C-5/08) EU:C:2009:465; [2011] E.C.D.R. 13 at [121].
[20] See generally Jovanovic M, "The originality requirement in EU and U.S., different approaches and implementation in practice" (2020) available at <ecta.org/ECTA/documents/MinaJovanovic3rdStudentAward202012149.pdf> accessed 15 September 2021.
[21] Jovanovic M, "The originality requirement in EU and U.S., different approaches and implementation in practice" (2020), available at <ecta.org/ECTA/documents/MinaJovanovic3rdStudentAward202012149.pdf> accessed 15 September 2021.

choices) is evidently centred on a subjective interpretation.

That there is a basic assumption under EU copyright law that the author of any copyright work must be human raises the question of whether having such a narrow and anthropocentric standard is desirable and, crucially, futureproof.[22] Drawing on (inter alia) philosophy literature, de Cock Buning argues that in traditional philosophy, creativity is defined as the ability to create something that is original, valuable and surprising.[23] This typically requires intent, desire or belief — attributes that would be absent in e.g. machines. This definition, the argument goes, is largely based on a dualistic view of the "mind-body" problem whereby the (non-physical) mind is clearly separated from the (physical) body, a notion that also appears to be reflected in the CJEU's originality standard (which emphasises the non-physical).[24] However, modern philosophers tend to adopt a monistic approach where the mind and body are viewed as a whole, whereby all behaviour, including creativity, belongs to the brain, an interpretation which is also supported by modern neuroscience and computer science.[25] Viewing creativity through this monistic angle, the emphasis is instead on the final output of the creative process, as opposed to the personal and conscious touch of the author. De Cock Buning thus argues that if judges and juries are to follow a modern view of creativity and no longer focus on the author's personal choices and feelings—but rather on the work they have created irrespective of the actual process—"the result of machine creativity could be compared to the result of human creativity objectively, without 'prejudice'".[26]

In other words, what would therefore be required to assess computer-produced works as "original" is an *objective* interpretation of originality which focuses on the final output per se— regardless of whether there has been a human being involved in its generation. This argument has also been raised in the context of US law by Yaniski-Ravid and Velez-Hernandez who argue that adopting an objective standard would allow judges to assess works made not only by humans (who act with intention) but also those by creative robots "for which it remains difficult

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[22] De Cock Buning M "Autonomous Intelligent Systems as Creative Agents under the EU framework for Intellectual Property" (2016) 7 E.J.R.R. 315, 321; see also Denicola R, "Ex Machina: Copyright Protection for Computer-Generated Works" (2016) 69 Rutgers L. Rev. 251, 286 (arguing, from a different (authorship) angle and the perspective of US law, that '…if a user's interaction with a computer prompts it to generate its own expression, the result is excluded from copyright. This is a tenuous and ultimately unnecessary and counter-productive distinction. It denies the incentive of copyright to an increasingly large group of works that are indistinguishable in substance and public value from works created by human beings.').

[23] Gaut B, "The Philosophy of Creativity" (2010) *Philosophy Compass* 5, p. 1039; Carruthers P, *The Architecture of the Mind*, (OUP, 2006), as cited in De Cock Buning M "Autonomous Intelligent Systems as Creative Agents under the EU framework for Intellectual Property" (2016) 7 E.J.R.R.

[24] De Cock Buning M "Autonomous Intelligent Systems as Creative Agents under the EU framework for Intellectual Property" (2016) 7 E.J.R.R. 315, 321.

[25] Turner, B *The Body and Society: Explorations in Social Theory* (Sage, 2008), p. 78.

[26] De Cock Buning M "Autonomous Intelligent Systems as Creative Agents under the EU framework for Intellectual Property" (2016) 7 E.J.R.R. 315 (points out that this approach is also supported by leading computer scientists, including the creator of the Painting Fool); see Ritchie G, "Some Empirical Criteria for Attributing Creativity to a Computer Program", 17 *Minds & Machines* (2007) at pp. 67-99.

to understand the concept of consciousness and intention".[27] In a case in Shenzhen, for instance, a Chinese court that considered a series of AI-produced news articles to be copyright appears to have taken this very approach.[28] This type of assessment effectively focuses on the external relationship between the expression, the way the audience sees the work and the resemblance of the expression to other works.[29] The interpretation undertaken by a judge or jury, considering the field of art, music or literature and the public to which it is addressed, as well as its closeness to pre-existing output, would be the crucial factors for the purpose of determining originality. This would evidently shift the focus from a subjective intention of the human author (which is obviously absent in circumstances where robots create independently or autonomously) towards the objective opinion of viewers or listeners of the work.

Yet, as we have seen, the current EU originality requirement requires a human touch, which inevitably makes any objective interpretation difficult, if not impossible; and clearly does not fit into the current EU *acquis* on the test. In other words, what would be required is a major paradigm shift in EU legislation and case law. Alternatively, this could be accommodated through the creation of a new sui generis right—specifically designed to deal with machine-generated output and having its own originality standard—a point to which we return later.

Protecting investment in AI—the UK's "pragmatic" approach

A pragmatic approach to dealing with works created by machines is visible in the UK Copyright, Designs and Patents Act 1988 (CDPA), s. 9(3) of which provides that:

> *"[i]n the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken."*[30]

This provision was first proposed in the late 1980s. The House of Lords recognised that, following technological advances since 1956 (when the former Copyright Act was enacted), there may now be instances where computers produce works to which it is not possible to

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[27] Yaniski-Ravid S and Velez-Hernandez L, "Copyrightability of Artworks Produced by Creative Robots and Originality: The Formality-Objective Model" (2018) 19 Minn. J.L. Sci. & Tech. 1, 33–35, 41–42.

[28] See Yangfei Z, "Court Rules AI-Written Article Has Copyright", (9 January 2020), China Daily, https://www.chinadaily.com.cn/a/202001. /09/WS5e16621fa310cf3e3558351f.html [Accessed 18 March 2020].

[29] Yaniski-Ravid S and Velez-Hernandez L, "Copyrightability of Artworks Produced by Creative Robots and Originality: The Formality-Objective Model" (2018) 19 Minn. J.L. Sci. & Tech. 1

[30] This provision just applies in case of literary, dramatic, musical or artistic works generated by computers. It seems thus to suggest that other types of works that may be produced by machines such as movies, software, or databases, are not copyrightable instead: see Chiabotto A, "Intellectual Property Rights over non-human generated creations" (2017), available at https://ssrn.com/abstract=3053772.

ascribe human authorship.[31] The provision was specifically designed to go beyond merely protecting works generated by using a computer as a tool or "clever pencil"—it is clear that the House was cautious of advances in artificial intelligence in particular.[32] In terms of the rationale behind the provision, investment in AI was a key priority:

> *"...the far-sighted incorporation of computer-generated works in our copyright system will allow investment in artificial intelligence systems, in the future, to be made with confidence"* (per the Earl of Stockton).[33]

Indeed, while copyright law would have little meaning as an incentive mechanism from the perspective of a machine—which would presumably lack consciousness (as of now) and thus produce works irrespective of the existence of exclusive rights or other rewards—having an explicit provision which covers computer-generated output will almost certainly encourage humans to *invest* in AI and thus produce socially valuable works.[34]

In terms of specific provisions, CPDA defines a computer-generated work as one created by a computer in circumstances where there is no human author.[35] S.9(3) CDPA essentially introduces a legal fiction. It considers the author a person who has not directly created the work but has merely made the necessary arrangements for such production to take place. In this sense the provision expands the notion of author,[36] taking into account the objective creation of the output, and then locating the most plausible nearby "author" (and owner), which could also be a company.[37] This provision could plausibly be extended by courts to cover AI-produced output.

One criticism of doing so is that it would set the stage for an expansion of corporate ownership

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[31] House of Lords Debate, Hansard, "Copyright, Designs And Patents Bill Hl" (Volume 489: debated on Thursday 12 November 1987) available at <https://hansard.parliament.uk/Lords/1987-11-12/debates/9b959a7b-172a-4e28-8676-1a6747b0f370/CopyrightDesignsAndPatentsBillHl> accessed 15 September 2021.

[32] See also UK Intellectual Property Office, "Artificial intelligence call for views: copyright and related rights" (23 March 2021) available at <https://www.gov.uk/government/consultations/artificial-intelligence-and-intellectual-property-call-for-views/artificial-intelligence-call-for-views-copyright-and-related-rights> accessed 15 September 2021.

[33] House of Lords Debate, Hansard, "Copyright, Designs And Patents Bill Hl" (Volume 489: debated on Thursday 12 November 1987), available at <https://hansard.parliament.uk/Lords/1987-11-12/debates/9b959a7b-172a-4e28-8676-1a6747b0f370/CopyrightDesignsAndPatentsBillHl> accessed 15 September 2021.

[34] See also UK Intellectual Property Office, "Artificial intelligence call for views: copyright and related rights" (23 March 2021), available at https://www.gov.uk/government/consultations/artificial-intelligence-and-intellectual-property-call-for-views/artificial-intelligence-call-for-views-copyright-and-related-rights accessed 15 September 2021.

[35] See Copyright, Designs and Patents Act 1988 s.178.

[36] The need for an expansion of the concept of author has been acknowledged for long time in legal scholarship, including in the US since the 1980s: see Butler T, "Can a Computer be an Author?" (1982) 4 Hastings Comm. & Ent. L.J. 707, 744–745 (noting that "[w]hen courts find that a given product of AI software is authored by machine rather than a person, the court should presume the existence of a fictional human author").

[37] Also, the CDPA has opted to use the term "author" when referring to the creator of a computer-generated work rather than, for example, the more neutral word "maker", which is used both in the EU Database Directive to define the person that comes up with a database (art.7.1). One may thus wonder whether the UK CDPA has tried to "humanise" computer-generated works by avoiding using impersonal and neutral terminology; see also
Hart, "Author's Own Intellectual Creation" (1993) 9 Computer Law and Security Review 164, 165.

of copyright works, something evident in the decision of the Chinese court in Shenzhen, referenced above.[38] Moreover, s.9(3) CDPA – and in particular its application to AI works - has been criticised for not actually addressing the issue of originality and for not being compliant with the EU *acquis*.[39] Indeed, provisions such as s.9(3) of the CDPA could be viewed as an exception to the originality requirement as it has been historically interpreted by UK courts.[40] Traditionally under UK law a work was considered original if it was the result of its author's own "skill, labour and judgement"—though post-*Infopaq* the "intellectual creation" test has been used by UK courts. Also, in AI scenarios the works produced (by a machine) do not directly originate from any author employing "skill and labour" — or indeed "intellectual creativity".[41] Yet, one may counter-argue that the legal fiction created by s.9(3) CDPA is not an isolated phenomenon in UK copyright law. S. 9(2) CDPA also considers as "author" the producer of a sound recording, the producer of a film (together with the principal director), the person making the broadcast and the publisher of a typographical arrangement of a published edition.[42] And such "authors" (e.g. producers) are actually often tied via contract to corporate entities (e.g. record companies).[43]

The scholarly debate on the issue of originality of machine-generated works is heated. Patrick Goold, for instance, argues that while the legislative history behind the provision suggests that such works are still subject to originality, this interpretation is inherently contradictory.[44] The reason for this is that if an AI-generated work is to pass the requirement, there must presumably be a human supplying the necessary originality. If this is the case, however, the work will clearly not be "computer-generated" as required by the legislation.[45] As of 2021, there has only

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[38] Yangfei Z, "Court Rules AI-Written Article Has Copyright" (9 January 2020), China Daily, https://www.chinadaily.com.cn/a/202001/09/WS5e16621fa310cf3e3558351f.html [Accessed 18 March 2020].

[39] See Iglesias M et al, 'Intellectual Property and Artificial Intelligence: A Literature Review' (Publications Office of the EU, 2019) <https://ec.europa.eu/jrc/en/publication/intellectual-property-and-artificial-intelligence-literature-review> at 15, and the sources cited therein, accessed March 2020.

[40] Rahmatian A, "Originality in UK Copyright Law: The Old 'Skill and Labour' Doctrine Under Pressure (2013)" 44 International Review of Intellectual Property and Competition Law 4. However, there is some disagreement regarding this issue.

[41] See also Guadamuz A, "Do Androids Dream of Electric Copyright?" [2017 I.P.Q. 169, 176; Lionel Bently, mentioned by Begoña González Otero and Joao Pedro Quintais, "Before the Singularity: Copyright and the Challenges of Artificial Intelligence", Kluwer Copyright Blog (2018), <http://copyrightblog.kluweriplaw.com/2018/09/25/singularity-copyright-challenges-artificial-intelligence> accessed 18 March 2020 (stressing that the CDPA provisions on computer-generated works do not offer a useful model for protecting AI outputs, because of their incompatibility with the EU copyright acquis and failure to address the issue of originality).

[42] See also Vaver D, "Translation and Copyright: A Canadian Focus" (1994) 4 E.I.P.R. 159 (noting, in relation to the expansion of the concept of author, that "computer-generated works join the list of other works for which the UK Act has created a fictitious author: the producer of a film or sound record, the maker of a broadcast, the provider of a cable service programme – almost all of which are equally fictitious persons, that is, corporations rather than humans)".

[43] Ricketson S, "People or Machines: The Berne Convention and the Changing Concept of Authorship" (1991–92) 16 Colum. J. L. & Arts 1, 16.

[44] See Goold P, "The curious case of computer-generated works under the Copyright, Designs and Patents Act 1988" I.P.Q. 2021, 2, 120-130, 124.

[45] Goold P, "The curious case of computer-generated works under the Copyright, Designs and Patents Act 1988" I.P.Q. 2021, 2, 120-130, 124.

been one case to specifically interpret s.9(3) CDPA[46] which, unfortunately, has failed to provide an answer to this crucial question.[47] The debate, therefore, continues.

What is more, while s.9(3) CDPA was the world's first copyright legislation attempting to deal with computer-generated works,[48] it is notable that—more than three decades later—only a handful of other (common law) jurisdictions have followed this approach.[49] As discussed above, the original rationale behind the provision was to encourage investment in AI. If there is evidence that the provision is effective and achieves its aims, it would indeed be reasonable to maintain the current law and even duplicate it in other jurisdictions. Guadamuz, for instance, describes the UK's model as "the most efficient", arguing it could help to ensure that companies keep investing in AI, safe in the knowledge that they will get a return on their investment.[50] He also argues that it should be adopted more widely.[51] It is nevertheless notable that significant investment in AI (and AI-generated works) has taken place in key jurisdictions such as the US, the world leader in the field, despite the clear lack of any such provisions in US copyright law.[52] It is also not difficult to see why others have taken the opposite view—arguing that not only should other states think twice before duplicating this provision, but that the UK should actually consider abolishing it—given that key questions are yet to be answered.[53]

Evaluating the public domain and sui generis right as solutions

Much of the above discussion has focused on how copyright deals with AI-generated works at present. However, not everyone agrees that the copyright system is an appropriate tool to regulate such output in the first place. Mezei, for instance, argues that copyright's traditional human-centric approach to authorship should be preserved, given that its core tenets are

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[46] *Nova Productions Ltd v Mazooma Games Ltd & Ors* [2006] EWHC 24 (Ch) (holding that a computer game player was not the author of screenshots taken while playing the game, as he had not undertaken the relevant arrangements necessary for their creation).

[47] Stephens K, "Who Owns an AI-generated Invention?" (December 2019), available at <https://www.twobirds.com/en/news/articles/2019/global/who-owns-an-ai-generated-invention> accessed 15 September 2021.

[48] House of Lords Debate, Hansard, "Copyright, Designs And Patents Bill Hl" (Volume 489: debated on Thursday 12 November 1987), per Lord Young of Graffham, available at <https://hansard.parliament.uk/Lords/1987-11-12/debates/9b959a7b-172a-4e28-8676-1a6747b0f370/CopyrightDesignsAndPatentsBillHl> accessed 15 September 2021.

[49] Namely, Ireland, New Zealand, India, South Africa and Hong Kong. This provision also inspired the 1990 WIPO Draft Model Copyright Law, which provides that the original owner of the economic rights in a computer-generated work may be either the person or entity "by whom or by which the arrangements necessary for the creation of the work are undertaken" or the person or entity "at the initiative and under the responsibility of whom or of which the work is created and disclosed": see International Bureau of WIPO, Preparatory Document, Draft Model Law on Copyright, pp.258-59 (No.CD/MPC/III2, 30 March 1990).

[50] https://www.wipo.int/export/sites/www/about-ip/en/artificial_intelligence/call_for_comments/pdf/ind_guadamuz.pdf

[51] Guadamuz A, "Do Androids Dream of Electric Copyright?" [2017 I.P.Q. 169, 186.

[52] UK Intellectual Property Office, "Artificial intelligence call for views: copyright and related rights" (23 March 2021), available at https://www.gov.uk/government/consultations/artificial-intelligence-and-intellectual-property-call-for-views/artificial-intelligence-call-for-views-copyright-and-related-rights accessed 15 September 2021.

[53] Goold P, "The curious case of computer-generated works under the Copyright, Designs and Patents Act 1988" I.P.Q. 2021, 2, 120-130, 124 (arguing that it is unclear how the provision fits with originality).

inextricably and inherently linked to human creativity.[54] Until we are certain—the argument goes—that society, as opposed to a few major stakeholders, would benefit from an AI-copyright regime (and there is convincing economic evidence and policy argument), it would be best not to regulate algorithmic creativity at all.[55]

Given the existing problems with copyright law in this context (EU law relies on a human-centric subjective approach to originality and even UK law, which has adopted a "pragmatic" approach to deal with this specific issue, has failed to provide concrete answers), we now consider various alternative approaches to regulation, including leaving AI-generated works in the public domain or adopting a new sui generis right.

The public domain solution

A tempting option could be to deem the works created by machines as automatically entering the public domain. As there is no human author directly involved in the creative production of the output, we could argue that no one should be able to claim exclusive rights over it.[56] Works produced by robots would thus be comparable to things found in nature, such as music that the wind generates when it moves through wind chimes or the sounds of a waterfall, or birds singing at dawn[57]—outputs which cannot be monopolised by anyone.[58] There is also an (obvious) incentive-related argument that supports this position. Computers and machines are not able to respond to the incentives offered by copyright—and therefore their works should remain in the public domain (at least until technology evolves deeply so as to give machines some sort of human-like consciousness).[59]

This solution would also neutralise the anti-competitive risks that an over-proliferation of strong and long monopolistic rights, owned by corporate entities and protecting AI produced output, may bring. The scenario would turn even more anti-competitive if a 'commissioned work' approach were used in relation to these works—with the programmer/employer considered the author and thus copyright owner. Under these circumstances AI companies may

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[54] Mezei P, "From Leonardo to the Next Rembrandt – The Need for AI-Pessimism in the Age of Algorithms" (2020) <https://ssrn.com/abstract=3592187> accessed 30 May 2020.

[55] Mezei P, "From Leonardo to the Next Rembrandt – The Need for AI-Pessimism in the Age of Algorithms" (2020) <https://ssrn.com/abstract=3592187> accessed 30 May 2020.

[56] Gervais D, "The Machine As Author" (forthcoming 2020) 105 Iowa Law Review, p. 10, SSRN, <https://ssrn.com/abstract=3359524> accessed 28 June 2020 (noting that "machine productions are *not* protectible by copyright once the machine has crossed what the Article calls the autonomy threshold and is no longer a tool in the user's hands or a reflection of its (human-made) program").

[57] Khoury A, "Intellectual Property Rights for Hubots: On the Legal Implications of Human-like Robots as Innovators and Creators" (2016-2017) 35 Cardozo Arts & Entertainment Law Journal, p. 668.

[58] Lim D, "AI & IP: Innovation & Creativity in an Age of Accelerated Change" (2019) 52 Akron Law Review 813, p. 840 (noting how according to several commentators the fall into the public domain of these works will provide fertilizer "to give birth to new artistic genres and whole new areas of innovation, where humans could build freely upon initial machine-output").

[59] Clifford R, "Intellectual Property in the Era of the Creative Computer Program" (1997) 71 Tulane Law Review 1675, pp. 702-703.

be attracted by the idea of securing ownership of exclusive rights at an unprecedented rate and thus decide to hoard access to their AI technologies, so as to always remain the 'employers' and therefore the right holders. This would consolidate the dominant position of a few tech companies.

The public domain option is not just a theoretical proposal. It is already operative in jurisdictions such as the US and Australia. Indeed, in these jurisdictions the public domain seems the default position for AI 'expressions'. Several scholars support this approach as well.[60] But what are the drawbacks of this? Would the refusal to offer machine algorithmic creativity legal protection discourage investments in, and dissemination of, these creative technologies? AI/robotics is a resource-intensive field, which raises the need to secure some sort of exclusive rights in the products of this investment. In this manner, some scholars argue that denying legal protection of machine generated outputs may not have the effect of increasing the public domain in the long run; in this view, this would have the effect of reducing the incentives to create new AI works, and thus may ultimately lead to a lower number of these outputs, and accordingly a decrease in works that would eventually enter the public domain.[61] Similarly, some scholars raise the speculative prospect that the arts, education, medicine, technology, amongst others, could suffer, resulting in loss of investments into valuable research and future AI applications.[62] On the other hand, given that other forms of protection - e.g. copyright and, in some cases, patents - are available for the programs themselves, even if not the outputs, one may argue that a sufficient incentive already exists. Regardless of these speculative arguments, there is little doubt that the debate will soon reach the legislative field, with all the attendant lobbying that takes place.

A sui generis right

We have seen that at present copyright regimes may not be fit to accommodate what is produced by algorithmic creativity; and indeed, copyright laws in several jurisdictions do not explicitly protect machine created works.[63] Yet, whether we agree or not, corporate entities may soon lobby for a form of exclusive rights to protect the final outputs of machine-driven processes.

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[60] See for example Bently L, mentioned by Otero B & Quintais J, "Before the Singularity: Copyright and the Challenges of Artificial Intelligence", Kluwer Copyright Blog (2018), <http://copyrightblog.kluweriplaw.com/2018/09/25/singularity-copyright-challenges-artificial-intelligence> accessed 18 March 2020; Perry M & Margoni T, "From Music Tracks to Google Maps: Who Owns Computer Generated Works?" (2010) 26 Computer Law and Security Review 621; Gervais D, "The Machine As Author" (forthcoming 2020) 105 Iowa Law Review, SSRN, <https://ssrn.com/abstract=3359524> accessed 28 June 2020; Gabison G, "Who Holds the Right to Exclude for Machine Work Products? (2020/1) Intellectual Property Quarterly. Available at SSRN: <https://ssrn.com/abstract=3498941> accessed 28 June 2020; Kop M, "AI & Intellectual Property: Towards an Articulated Public Domain" (2019), available at <https://ssrn.com/abstract=3409715> accessed 28 June 2020.
[61] Hristov K, "Artificial Intelligence and the Copyright Dilemma" (2016) 57 IDEA: The IP Law Review 431, p. 439.
[62] Hristov K, "Artificial Intelligence and the Copyright Dilemma" (2016) 57 IDEA: The IP Law Review 431, p. 439.
[63] The lack of human authorship/originality is a key factor in this regard.

Could an acceptable compromise be offered by a sui generis system—a kind of protection that could incentivise the development of and use of AI creative platforms while at the same time safeguarding human ingenuity?[64] The benefit of a sui generis regime (as opposed to using the strong conventional copyright to protect such works) would be that right holders could be given only a thin scope of protection, allowing them to prevent others from exploiting exact copies of the machine-generated work. In this view, such a right would essentially give protection against literal copying only.[65] As to the length of protection, unlike the typical copyright duration, a very short term could be applied in the AI context e.g. three years from the date of publication.[66]

Why should a thinner and shorter right be preferred?[67] The usual justifications for the long duration in the context of human authors would not apply. In fact, providing AI developers and companies incentives for AI-created works by offering the strong traditional copyright protection/duration may even lead to fewer human-generated works being created in the long run.[68] AI creative capacity is potentially both more vast and speedier than human capacity.[69] The risk is a devaluation of human intellectual ingenuity and a marginalisation of the human creative potential. [70] Just as automation threatens (and, over time, eliminates) jobs in

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[64] Lauber-Rönsberg A & Hetmank S, "The Concept of Authorship under Pressure: Does Artificial Intelligence Shift Paradigms?" (2019) 14 J.I.P.L.P. 509, 577. See also García S, "Las obras creadas por sistemas de inteligencia artificial y su protección por derecho de autor" [2019] InDret, Revista para el análisis del derecho; Ramalho, "Will Robots Rule the (Artistic) World?" (2017) 21 Journal of Internet Law 12, 16–20 (proposing to adopt a (i) regime similar to the EU database right under the EU Database Directive (Directive 1996/9), which notoriously aims at protecting investments made in producing compilation of data; or (ii) a sort of "disseminator's right" comparable to the publisher's right in the publication of previously unpublished works provided by the EU Term of Protection Directive (Directive 93/98), replaced by Directive 2006/116). The second proposal is more concerned with enhancing the accessibility of AI produced content: while such a right would be inherently economic, it would allow the right holder to extract value out of the creations and at the same time aim at encouraging the dissemination of algorithmic output. For academic opinions against sui generis systems of protection of AI-generated outputs, see Goold P, "The curious case of computer-generated works under the Copyright, Designs and Patents Act 1988" (2021) I.P.Q.; see also Mezei P, "Intervention to WIPO's AI and IP conversation" (23 June 2020) <http://copy21.com/2020/06/intervention-to-wipos-ai-and-ip-conversation/> accessed 28 June 2020 (expressing a "pessimistic view" on copyright protection of AI-generated output and arguing that the maximum protection such output should receive would be a new sui generis regime, "the scope of which can only be set following a deep empirical and multi-disciplinary analysis of the marketability of outputs (economic analysis) as well as the individual and cultural/social consequences (cultural analysis) of an AI-centred protection upon an human-centred regime, where the ultimate goal shall remain that copyright law aims the development of individual humans and the society/humankind in general.").
[65] For a proposal attributing a thin scope of protection to programmers, see also Yu R, "The Machine Author: What Level of Copyright Protection Is Appropriate for Fully Independent Computer-Generated Works?" (2017) 165 U. Pa. L. Rev. 1245, pp. 1268–1269.
[66] The length of term suggested in a recent AIPPI "Study Question" by Dutch delegates; see AIPPI Summary Report – 2019 Study Question on Copyright/Data Copyright in Artificially Generated Works, p.17, <https://aippi.org/wp-content/uploads/2019/08/SummaryReport_COPYRIGHT-DATA_London2019_final_160719.pdf> Accessed 19 March 2020; Bonadio E and McDonagh L, "Artificial Intelligence as Producer and Consumer of Copyright Works: Evaluating the Consequences of Algorithmic Creativity" (2020) 2 Intellectual Property Quarterly.
[67] S. 12(7) of the CDPA states that copyright in computer-generated works "expires at the end of the period of 50 years from the end of the calendar year in which the work was made".
[68] Gervais D, "The Machine As Author" (forthcoming 2020) 105 Iowa Law Review, p. 9, SSRN, <https://ssrn.com/abstract=3359524> accessed 28 June 2020. On intrinsic motivations as factors which stimulate creativity, see Buccafusco C and Sprigman C, "Experiments in Intellectual Property" in Menell P and Schwartz D (eds), *Research Handbook on the Economics of Intellectual Property Law* (Cheltenham: Edward Elgar, 2016).
[69] AIPPI Summary Report, pp.7–8, <https://aippi.org/wpcontent/uploads/2019/08/SummaryReport_COPYRIGHT-DATA_London2019_final_160719.pdf> accessed 19 March 2020 (French Group position).
[70] AIPPI Summary Report, p.13, <https://aippi.org/wp-content/uploads/2019/08/SummaryReport_COPYRIGHT-DATA_London2019_final_160719.pdf> accessed 19 March 2020 (UK Group position).

manufacturing, AI creativity could threaten the value of human authorship.

The provision of a limited sui generis right might neutralise this risk by providing an incentive to recognise the creativity of AI works without giving machines an equal level of protection to humans.[71] The fact that only literal copying would be prohibited would leave human creators free to adapt, transform and reinterpret AI-generated works and thus to use them for creative purposes. In fact, such a feature of the proposed sui generis right may fit with the characteristics of many AI machines such as Amper, an AI music composition system.[72]

Overall, the introduction of a thin and time-limited right could achieve an appropriate balance: while some incentives would still be given to the developers of AI creative technologies via the offer of exclusive rights aimed at preventing the exploitation of the final output by third parties, the reduced scope and duration of the protection will leave human creators with enough freedom and motivation to create. Such a balance would preserve value in human ingenuity (fully protectable by copyright) and at the same time protect machine produced outputs sufficiently (and thus encourage investments in and use of AI technologies).[73]

What would the requirement for attracting the sui generis protection be? An originality test as assessed and interpreted objectively and contextually would be appropriate (see the detailed discussion on originality above).[74] Judges could consider the work's aesthetic, literary or artistic similarity to existing works when considering originality, in the sense of being sufficiently distinguishable from prior works. While this would necessarily differentiate the originality standards between human created works and AI works, it is worth noting that the requirements for attracting protection can vary even depending on the kind of output. Under UK law, for example, while graphic works, photographs, sculptures and collages attract copyright based on originality "irrespective of artistic quality", other fruits of human creativity like works of artistic craftsmanship are protected only if they reach a certain threshold.[75] There is no doubt that protecting AI-generated works will shift the focus from the subjective element of traditional creative processes (the centrality of the human author) to the objective outputs produced by machines, thus changing the emphasis from authors to works.[76] Yet, as mentioned,

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[71] See again AIPPI Summary Report, p.17, (German Group) (noting that a shorter term of protection is justified in light of "the reduction in costs by using the AI in generating the works … to safeguard the rights of traditional authors from being replaced by the cheaper labour of AI").

[72] Grubow J, "O.K. Computer" (2018) 40 *Cardozo Law Review* 409, 416.

[73] AIPPI Summary Report – 2019 Study Question on Copyright/Data Copyright in Artificially Generated Works, p. 13, <https://aippi.org/wp-content/uploads/2019/08/SummaryReport_COPYRIGHT-DATA_London2019_final_160719.pdf> (UK Group position).

[74] AIPPI Summary Report, p.16 (UK and Singapore Groups position).

[75] CDPA s.4(1) s.4(1).

[76] Denicola R, "Ex Machina: Copyright Protection for Computer-Generated Works" (2016) 69 Rutgers L. Rev. 251, 270. See also de Cock Buning, "Autonomous Intelligent Systems as Creative Agents under the EU framework for Intellectual Property" (2016) 7 E.J.R.R. 310 (noting that "if courts no longer assess the author, but rather the work he created, regardless of the

the negative effects of such a shift (in terms of a progressive marginalisation of human ingenuity) could be contained, if not almost fully neutralised, if a proper balance between the above needs is found.

Who would the owner of such a sui generis right be? The UK AIPPI Group identifies two alternative approaches, i.e. the proximity and the investment approaches.[77] By using the former criterion, the owner could be: (i) the natural or legal person that is most closely associated with the creative output—for example the person who comes up with the code (coder); or (ii) the person who identifies the objective to be reached (goal selector); or (iii) the person who chooses the input data (data selector); or (iv) the person who trains the AI (trainer); or (v) the person who carries out a qualitative or aesthetic selection of a work from a number of new artificially generated works (output selector).[78] Unsurprisingly, the UK Group of AIPPI favours the *investment* approach on the basis of legal certainty, thus clearly arguing for corporate ownership, i.e. that the natural or legal person who invests in the project should be considered the owner of the sui generis right.[79]

EU law seems to support this approach. The EU Info-Society Directive in Recital 5 recognises that:

> [t]echnological development has multiplied and diversified the vectors for creation, production and exploitation. While no new concepts for the protection of intellectual property are needed, the current law on copyright and related rights should be adapted and supplemented to respond adequately to economic realities" (emphasis added).

Recital 5 mentions "related rights" as referring to rights protecting outputs such as cinematographic works, sound recordings and broadcasts. And a sui generis right protecting AI-created works might fit well into the "related right" category that aims at incentivising investments in crucially relevant technological fields.[80]

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process by which he came by it, the result of machine creativity could be compared to the result of human creativity objectively, without 'prejudice.

[77] AIPPI Summary Report, pp.16–17 (UK Group position).

[78] AIPPI Summary Report, pp.16–17 (UK Group position).

[79] AIPPI Summary Report, pp. 16–17. Finally, no moral rights should follow the introduction of this sui generis form of protection. After all, UK copyright law currently excludes the applicability of moral rights to computer-generated works. On the inappropriateness of the *proximity* approach when it comes to attributing copyright in AI-generated artworks, see also Megan Svedman "Artificial Creativity: A Case Against Copyright for AI-Created Visual Artwork" (2020) 1 *IP Theory* 5.

[80] See also Bond T and Blair S, "Artificial Intelligence & Copyright: Section 9(3) or Authorship Without an Author" (2019) 14 J.I.P.L.P. 423 (noting that the solution may lie in recognising computer-created works as deserving of only economic rights similar to those offered to movies, broadcasts, sound recordings and typographical arrangements). After all, a sui generis approach had been advocated by Karl Milde back in 1969: see Milde, "Can a Computer Be an 'Author' or an 'Inventor'?" (1969) 51 J. Pat. 378, 402 (stressing "the necessity of a new type of protection, sui generis to the problem of computer talk, which would also make practical the enforcement of any right granted").

There are also arguments that caution against the introduction of a sui generis system. Creating sui generis laws to accommodate the needs of a certain sector or industry fails to keep copyright regimes technology-neutral.[81] Yet, it could be counter-argued that copyright laws bring with them the seed of "differentiation". These laws have produced across the decades different rules in relation to different works. For example, the range of copyright works are quite distinct from each other, from literary, artistic and musical works to more entrepreneurial (and investment-driven) kinds of subject matters including typographical arrangements of published editions, original compilations of data and sound recordings, broadcasts and movies. These are exactly the kinds of works highlighted in other chapters of the present volume.

Perhaps the greatest concern with the enactment of a new right would be the danger of increased corporate ownership. This is undoubtedly a worry. However, the above-mentioned Shenzhen case demonstrates that in the absence of a thin sui generis right, corporate entities will attempt to claim the full rights of copyright over AI created works. Thus, even if there are risks attached to a sui generis system, if it is enacted in a balanced way the risk of ending up consolidating and overprotecting monopolistic rent-seeking power may be significantly reduced, if not completely ruled out.

Conclusion

The debate on whether and how AI-produced works could and should be protected by copyright fits well into the scope of analysis of this book. Indeed, the present volume aims to spark an academic discussion on whether and to what extent modern intellectual property rights should reward entrepreneurial investments over human creativity and ingenuity. It is clear that provisions on copyright in computer generated works (which also accommodates output created by AI) go in that direction. While these rules cannot incentivise and reward machines, they can encourage and recompense companies which invest time and money to develop AI/robots capable of generating art, music and literature. In this view, what S.9(3) CDPA achieves is to promote and protect investments in new technologies. Should a *sui generis* right of the type recommended in this article be finally adopted by some countries, such a regime would follow a similar line of thinking. It would be a right aimed at incentivising and rewarding investors in AI creative technologies. It would however provide a guarantee which provisions like S.9(3) CDPA cannot give: i.e. a much-needed balance between encouraging investments in algorithmic creativity and safeguarding human ingenuity. The UK approach of granting machine-generated works copyright protection (which lasts for 50 years after the death of the

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[81] De Rouck F, "Moral Rights & AI Environments: the Unique Bond between Intelligent Agents and their Creations" (2019) 14 J.I.P.L.P. 203.

fictional author) goes too far,[82] offering too high a level of protection. Indeed, a more limited protection for this type of work would significantly reduce (if not eliminate) risks of a futuristic (and scary) scenario where robotic creativity – even that which relies on human labour for training of AI – might gradually displace human ingenuity.[83]

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[82] Section 12(7) of the CDPA provides that copyright in computer generated works "expires at the end of the period of 50 years from the end of the calendar year in which the work was made".
[83] Gahntz, M, 'The invisible workers of the AI era' *Towards Data Science* (December 2018), <https://towardsdatascience.com/the-invisible-workers-of-the-ai-era-c83735481ba> accessed 15 September 2021.