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Submission for

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Artificial Intelligence and IP: copyright and patents’

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Section A - Copyright – computer generated works (CGW)

Section A: Computer Generated Works (CGW) Option 1 - remove CGW protection

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This part pertains to Section 1 CGWs and argues for removal of CGW protection.

The UK IPO's Impact Assessment lists limitation of copyright protection to human creations as one of the consequences of the removal of CGWs protection (see "Option 1: Remove protection for new computer-generated works. This would limit copyright protection to human creations." Impact Assessment document, p 13 and similarly 18). In response to this, it seems desirable to add that by removing the provisions on CGWs, the protection of human creations and the protection for human authors remains intact. This is because the CGWs are, by definition, authorless (ie without a human author) and hence are no human creations.

This part respectfully questions the order of policy objectives mentioned in the Impact Assessment document ("Policy objective: Any interventions should: • encourage innovation in AI technology or promote the use of AI for the public good; and • not undermine IP's wider role in promoting human creativity and innovation (the Impact Assessment, p 11). Since the fundamental and primary concern of intellectual property law is to reward and incentivise human creativity, the order of the objectives should be reverse: any intervention should aim at encouraging human creativity and innovation while not undermining innovation in AI technology. This corresponds to the copyright law tradition. Human creativity poured (directly and immediately) into creation of literary and artistic works lies at the heart of copyright protection since the Statute of Anne 1710 and without human creativity-based justifications, the copyright system would be hardly sustainable.

Another reason for changing the order of priorities is that if something goes wrong, investment in AI innovation can be boosted anytime (and by other means than copyright too). But the loss of traditions of human authorship and human creativity could be irreversible and irrecoverable. (This relates to the argument mentioned in the Impact Assessment, p 35-36 about the momentarily absence of competitive pressure from CGWs. However, the quality of AI-generated works can be expected to be improved tremendously and rapidly based on its recorded transformative developments in the last five years.)

The removal of CGWs provisions is recommended also for wider consistency and coherency reasons. First, the provision does not make sense in the systematics of the Copyright, Designs and Patents Act 1988 (CDPA). Section 178 CDPA defines a computer-generated work as a work that is generated by a computer in circumstances such that there is no human author of the work. Then section 9(3) CDPA provides that if such a computer-generated work is a literary, dramatic, musical or artistic work, 'the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken.' None of the provisions solves the problem of originality of these authorless literary, dramatic, musical or artistic CGWs.

Second, the reasons for its initial enactment are unclear and until today the provisions remain unjustified. The Whitford Committee recommended to rely on the concept of author and praised 'the simplicity of this approach as giving further support to our decisions against making any other person or persons the author of the output' (House of Commons, *Copyright and Designs Law*, Whitford Report, Cmnd 6732, 1977). The White Paper that followed stated that '[i]f no human skill and effort has been expended then no work warranting copyright

protection has been created' (Department of Trade and Industry, *Intellectual property and innovation* (White Paper, Cmnd 9712, 1986) [9.7].)

Thirdly, the CGWs provisions are not widely used and when they are, their use is confusing. In *Nova Productions Ltd v Mazooma Games Ltd* [2006] EWHC 24 (Ch) [2006] E.M.L.R. 14 they were applied with the result that the subject matter in question was found to have a human author (the creator) and, at the same time, the same subject matter was found to be an authorless CGW (*Nova Productions Ltd v Mazooma Games* [104]).

Lastly and most importantly, any special regime for CGWs can operate successfully only if it implements a working method enabling to distinguish a work created by a human being (the author-creator) from an authorless CGW. How can one identify elements of a work created and originated with a human from elements created by an AI-driven system? This is still an open question. Answering this question is a key pre-condition for implementing any normative proposals as to protecting authorless subject matter by copyright (as CGWs), by sui generis rights or neighbouring rights.

The Impact Assessment mentions also the risk of false attribution of a CGW to a natural person. This risk of disguise of the origin of a work is a real concern, and if it materialises, in certain circumstances it could constitute a fraud by false representation. The reason for honest attribution of works to their authors is not only to protect the honour and reputation of authors as their creators but also to inform the public and let it make informed decisions in relation to the work (for more details see Jane C Ginsburg, 'Moral rights in a common law system' (1990) 1 EntLR, 121).

Copyright – text and data mining (TDM)

By Katarina Foss-Solbrekk and Anupriya Dhonchak

7. Is there a specific approach the government should adopt in relation to licensing?

The government should seek to reform TDM licensing practices as relying on licensing to facilitate TDM may prove problematic in practice. This is due to the need for individual licenses, licensing negotiations, high transactions costs, as well as the vast amount of data involved. A 2018 study analysing the terms and conditions of 21 online platforms operating both ‘globally and locally’ states that their findings show ‘a trend toward a general contractual ban of TDM. The prohibition is broad and refers to all the website’s contents and services’.¹

The time, cost and effort needed to obtain such data through licensing may place potential TDM users with less means at a significant disadvantage, particularly start-ups, and small and medium-sized enterprises.² This, in turn, may impede the development of useful, safe and trustworthy AI. Indeed, such actors ‘may find it economically attractive to train their algorithms on “cheaper”, which often means older, less accurate or biased, data, leading to the possible development of second class AI applications for those who cannot afford the costs of first class AI, thereby favouring algorithmic discrimination and inequality’.³ Equitable access to large and useful datasets is therefore imperative for the development of AI.

Such licensing issues are not new. Similar issues are experienced in other areas of copyright, such as with collecting societies. The European Commission notes that ‘the functioning of some collecting societies has raised concerns as to their transparency, governance and the handling of revenues collected on behalf of right-holders’, further noting that they must ‘provide a more efficient service to rightholders and users (service providers) alike: better collection and redistribution of revenue, accurate invoicing and more granting of multi-territorial licences for aggregated repertoire’.⁴ Other issues include how collecting societies charge rates,⁵ license works and class rights, as well as a lack of universal licensing and worries that current practices do not align with ‘a fast-evolving digital economy’.⁶ Collecting societies also fail to strike agreements with online content-sharing service providers. A 2013 study found that, due to the licensing conflict between Google and Germany’s collecting society, 60% of the 1000 highest rated YouTube videos were inaccessible in Germany.⁷

¹ Rossana Ducato and Alain M. Strowel, ‘Limitations to Text and Data Mining and Consumer Empowerment: Making the Case for a Right to “Machine Legibility”’, CRIDES Working Paper Series, 31 October 2018, 22.

² Luisa Gatti, ‘The European solution for text and data mining: a focus on the opt-out system provided by article 4 of the DSM Directive’ (2021) 43 EIPR 765,769-770.

³ Thomas Margoni and Martin Kretschmer, ‘A deeper look into the EU text and data mining exceptions: harmonisation, data ownership, and the future of technology’ CREATE Working Paper 2021/7, 5; See also Amanda Levendowski, ‘How copyright law can fix Artificial Intelligence’s implicit bias problem’ (2018) 93 Wash. L. Rev 579.

⁴ European Commission, ‘Proposed Directive on collective management of copyright and related rights and multi-territorial licensing – frequently asked questions’

<https://ec.europa.eu/commission/presscorner/detail/fr/MEMO_12_545>

⁵ See, for example: Eleonora Rosati, ‘OSA (the Czech Spa case): Article 102 TFEU as a Means to Attack Excessive Copyright Fees of Collecting Societies?’ (2014) 6 Journal of European Competition Law & Practice 96, 96-97.

⁶ European Commission (n 4).

⁷ Sebastian Haunss, ‘The Changing Role of Collecting Societies in the Internet’ (2013) *Internet Policy Review* <<https://policyreview.info/articles/analysis/changing-role-collecting-societies-internet>>;

Several options for reform exist. A governmental body tasked with overseeing TDM licensing could be created. Said body could publish a standard TDM licensing agreement(s) which users and rightholders may rely upon, as well as guidance for how to execute and manage such an agreement, accompanied by best practice guidelines for different TDM uses. If other countries established similar bodies, or tasked pre-existing bodies with similar tasks, these could collaborate to avoid parties from seeking individual national licenses. This resembles the joint venture ('JV') entered into by the Swedish, German and British collecting societies in 2015 in order to save platforms such as YouTube and iTunes from seeking individual national licenses; instead, the 'JV will provide the platforms with one licence covering all three repertoires on a multi-territorial basis'.⁸ An impartial body could be established to strike licenses with rightholders, and then sign licensing agreements with TDM users, effectively forming a 'copyright licensing pool' or 'data pool', similar to the Creative Commons or Medicines Patent Pool.

8. Please rank the options in order of preference (most to least preferred) and explain why.

This section ranks the order of preferences. Option 0 and Option 2 are the most preferred options.

Although the purpose of a TDM exception is to permit such use for copyright material, it is important to recognise that such an exception and access to data will, in practice, have implications beyond copyright law. Indeed, 'by devising the rules that regulate access to a certain technology and by allocating ownership in the elements necessary to develop it, we are shaping that technology and its impact on society for the years to come'.⁹ Given the current, as well as ever-increasing importance of TDM, neither licensing nor an exception might be the best route. The UK IPO should therefore also assess whether introducing TDM use as a right, as opposed to an exception, could be an option in the long-term.

1. Option 2: Extend the existing TDM exception to cover commercial research and databases

The first most preferred option is to extend the existing TDM exception to cover commercial research and databases. Commercial research is discussed first, before turning to databases.

First, including commercial research would open for more useful information to be found through TDM, which is in the public's interest. Promising and important fields in this regard include medicine and biology, where TDM may help uncover new uses for medicines or help further our understanding of diseases. Relatedly, the line between commercial and non-commercial activities often tends to be fuzzy, particularly when socially beneficial TDM products are concerned, for instance, language translation, internet search and projects that utilise AI for the public good.¹⁰

Second, it would permit TDM for public-private partnerships pursuing research with a public interest or other public interest commercial activities such as journalism.¹¹ The importance of

⁸ Sophie Lawrence, Elisabetta Rotondo and Pat Treacy, 'IP and Competition: A Survey of Developments' (2016) 7 *Journal of European Competition Law & Practice* 227, 238-239.

⁹ Margoni and Kretschmer (n 3) 5.

¹⁰ AI For Good with Microsoft, <<https://www.microsoft.com/en-us/ai/ai-for-good>>.

¹¹ See NGRAM VIEWER, <<https://books.google.com/ngrams>> (a 'text mining experience' offered to all internet users through a graphic tool created in collaboration between Google and Harvard University researchers).

the former was recognised in the UK government's Industrial Strategy¹² and AI Sector Deal.¹³ Third, it would allow small to medium businesses and start-ups, who might not hold vast amounts of data, to conduct TDM, which might level the competitive playing field and foster innovation in the technological sector. Fourth, it would better align the UK's TDM exception with that of the EU's, as laid down under Articles 3 and 4 of the EU Directive on Copyright in the Digital Single Market.¹⁴ This is important to facilitate cross-border research collaborations for the development of AI. Finally, the TDM exception should apply more clearly to uses other than merely making copies of the work concerned to include the right to adapt¹⁵, store¹⁶, extract¹⁷ and reuse¹⁸ it. In certain situations, researchers may require access to the work remotely and providing such access would implicate the making available right in addition to the reproduction right.¹⁹

Further, the exception should preclude non-copyright regimes such as contract law (e.g. purchasing or licensing restrictions on research uses) and prohibitions on the circumvention of TPMs from impeding digital research by restricting uses for machine learning and AI.²⁰

Although using works protected by copyright for commercial research might, at first blush, appear to undermine rightsholders' exclusive rights, this is not always the case. TDM 'is not about displacing existing content but rather extracting further knowledge from it and, in doing so, rendering it more valuable'.²¹ When works are reproduced for TDM, the original work and its creative expression is not used as such, it is used in order to obtain further information.²² The rightsholder and commercial 'researcher' are also not in competition with each other, nor would the researcher undermine the creativity of the original work, or free ride unduly. The information extracted through TDM and the original work are not competing works. They serve two different purposes entirely. As Lemley and Casey observe, 'an ML (machine learning)

¹² 'Industrial Strategy'

<https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf>.

¹³ 'AI Sector Deal' (Policy paper, last updated 21 May 2019) <<https://www.gov.uk/government/publications/artificial-intelligence-sector-deal/ai-sector-deal>>.

¹⁴ Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC (Text with EEA relevance.) PE/51/2019/REV/1 OJ L 130, 17.5.2019, p. 92–125.

¹⁵ See Copyright Law of Japan, Article 47, *reprinted in* <https://www.cric.or.jp/english/clj/doc/20161018_October,2016_Copyright_Law_of_Japan.pdf>.

¹⁶ See Bernt Hugenholtz, 'The New Copyright Directive: Text and Data Mining (Articles 3 and 4)' Kluwer Copyright Blog (July 24, 2019), <<http://copyrightblog.kluweriplaw.com/2019/07/24/the-new-copyright-directive-text-and-data-mining-articles-3-and-4/?print=print>> (explaining why storage rights are essential for corroboration purposes).

¹⁷ Digital Republic Act, Loi Pour Une République Numérique, 2016, Art. 38 (France), *reprinted in* <<https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000033202746&categorieLien=id>>.

¹⁸ *ibid.*

¹⁹ WIPO Conversation on Intellectual Property (IP) and Artificial Intelligence (AI), WIPO/IP/AI/2/GE/201, 7, <https://www.wipo.int/export/sites/www/aboutip/en/artificial_intelligence/call_for_comments/pdf/org_global_expert_network_on_copyright_user_rights.pdf>.

²⁰ Thomas Margoni and Giulia Dore, 'Why We Need a Text and Data Mining Exception (But it is Not Enough),' (2016) 3 <<https://zenodo.org/record/248048#.WXdf2oiGNEY>> (stating that 'a TDM exception, not limited to non-commercial purposes . . . should be implemented as soon as possible'); I. Hargreaves, *Digital Opportunity: A Review of Intellectual Property and Growth*, (2011) <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/32563/ipreview-finalreport.pdf> (recommending TPM exception for data mining).

²¹ Eleonora Rosati, 'An EU text and data mining exception for the few: would it make sense?' (2018) 13 JIPLP 429, 430.

²² Ducato and Strowel (n 1) 20.

system's use of the data is transformative ... because even though it doesn't change the underlying work, it changes the purpose for which the work was used.²³ By stating that 'the elements thus reproduced are the expression of the intellectual creation of their author', the *Infopaq* ruling also limited the scope of copyright protection to expressive elements.²⁴ By definition, information is not the copyrightable expressive elements. Thus, TDM does not pose any detriment to the core interest of exclusive rights because it makes only "non-expressive" uses of works which are not protected by copyright.

Including databases is also important as much data is stored in databases and access to such databases is difficult to obtain: 'many times access to databases is based on acceptances of Terms of Use that limit TDM'.²⁵ A TDM exception for databases would thus simplify this process. It would also counteract the overdeterrence that is likely to occur from enforcement of a copyright claim, for instance via an application of statutory damages in cases of infringement of potentially millions of works in the act of using databases for machine learning, including to train AI applications.²⁶

2. Option 0: Make no legal change

The second most preferred option is to make no legal change to the current TDM regime as there might not (yet) be a need to do so. The exception already allows for a wide range of TDM. Although the current exception is limited to non-commercial use without permission from the rightsholder, AI developers can use facts and non-creative data, that is, works not protected by copyright, as input data for AI systems, for both commercial and non-commercial research. As such, much data that is relevant for TDM may very well fall outside of copyright law, and thus be used lawfully without a TDM exception. Equally, §29A (2) of the Copyright, Designs and Patent Act 1988 provides that there is no copyright infringement if the copy of a work made under that section is used for any purpose other than that mentioned in subsection (1)(a), ie 'work for the sole purpose of research for a non-commercial purpose' if the use is authorised by the copyright owner. As such, this entails obtaining authorisation, such as a licensing agreement. Obtaining such agreements for commercial use might strike a fairer balance between rightsholders and users, but it may, as explained further below, encounter difficulties in practice.

It is, however, recommended that the UK IPO launch a review to assess who most makes use of the TDM exception, for which purposes, which restrictions they may face when doing so and, indeed, whether the current law is even an impediment to accessing material for text and data mining. Moreover, if there is no legal change, the UK IPO should issue guidance on the TDM exception, including on what constitutes non-commercial research, particularly if a public research institution is working with a commercial company in the public's interest, as well as when non-commercial use turns to commercial use, and on fair dealing.

²³ Mark Lemley and Bryan Casey, 'Fair Learning' (2020) 111-112

<https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3528447> ('The ML system wants photos of stop signs so it can learn to recognize stop signs, not because of the artistic choices you made in lighting or composing your photo').

²⁴ Case C-5/08, *Infopaq International A/S v Danske Dagblades Forening* EU:C:2009:465.

²⁵ Margoni and Kretschmer (n 3) 25.

²⁶ WIPO Conversation on Intellectual Property (IP) and Artificial Intelligence (AI), WIPO/IP/AI/2/GE/201, 10. <https://www.wipo.int/export/sites/www/aboutip/en/artificial_intelligence/call_for_comments/pdf/org_global_expert_network_on_copyright_user_rights.pdf>.

3. Option 3: Adopt a TDM exception for any use, with a rights holder opt-out

This option makes the scope of the TDM exception undesirably narrow since a rightsholder can explicitly reserve their rights and make the exception inapplicable.

4. Option 1: Improve licensing environment for the purposes of TDM

Improving the licensing environment for TDM purposes might, on the one hand, be beneficial in order to avoid making the accessibility of data needed for the development of AI reliant on an exception.²⁷ However, as licensing practices currently stand, it might be too strenuous to facilitate TDM given the amount of data needed, the diversity of licensing practices, as well as the different rightsholders involved, and thus the number of licensors a user would have to obtain licenses from. The UK government previously noted, ‘some publishers take an active role in developing text and data analytic technologies, and that some offer contracts that support the use of these technologies’, and that ‘under current conditions, research projects may in some cases require specific permissions from a large number of publishers in order to proceed’, but that this ‘is in some cases an insurmountable obstacle, preventing a potentially significant quantity of research from taking place at all’.²⁸ Academics also note that ‘obtaining specific permission from various publishers to carry out TDM research can be extremely complex’²⁹ and that ‘publishers can put specific clauses in their licenses that rule out mining and gaining permission to mine content from various publishers can be hugely complex’.³⁰ And, moreover, that ‘because training sets are likely to contain millions of different works with thousands of different owners, there is no plausible option simply to license all of the underlying photographs, videos, audio files, or texts for the new use’.³¹ High transaction costs, such as licensing negotiations and fees, may, moreover, increase the cost of TDM. Making data accessibility reliant on price, not only places users on an unequal footing, but may hinder the development of AI systems, as was discussed above.

In order to improve the licensing environment for TDM purposes, standard licensing contracts should be published and used. Contractual guidance for TDM users should also be published, particularly advice and procedures for what may be done if rightsholders refuse to license their works for TDM or seek overly restrictive licensing clauses. The answer to question 7 above also makes further suggestions to how licensing may be improved.

5. Option 4: Adopt a TDM exception for any use, which does not allow rights holders to opt out

A TDM exception should not be adopted for any use, including both non-commercial and commercial purposes, wherein rightsholders cannot opt out or override the exception by contract. Creating, gathering, assembling and displaying the work that would be subject to such an exception not only requires human effort and significant investment, but is an innovative endeavour itself. Such efforts should be rewarded, and rightsholders should be able to control

²⁷ Note however that the US, for example, relies on a fair use defence for TDM, see: Pamela Samuelson, ‘Regulating Technology Through Copyright Law: A Comparative Perspective’ (2020) 42 EIPR 1 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3635094>.

²⁸ HM Government, ‘Modernising copyright: a modern, robust and flexible framework. Government response to consultation on copyright exceptions and clarifying copyright law’ 37 <https://www.mpaonline.org.uk/wp-content/uploads/2017/09/Modernising_Copyright_-_a_modern_robust_and_flexible_framework_-_Government_response.pdf>.

²⁹ Christophe Geiger, Giancarlo Frosio and Oleksandr Bulayenko, ‘Text and data mining: Articles 3 and 4 of the Directive 2019/790/EU’ (Center for the International Intellectual Property Studies Research Paper No. 2019-08) 18, <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3470653>.

³⁰ *ibid*, 19.

³¹ Lemley and Casey (n 23) 111.

exploitations of their works, as is the original goal and justification of copyright protection in Europe. Rightsholders must therefore be able to opt out of the TDM exception if permitted for any use.

Patents

By Van Anh Le, Caoimhe Ring and Li Liu

Our response contains five parts. Part I attempts to clarify the definition of AI-devised inventions. We argued that this definition needs to be subdivided into “AI-generated invention” and “AI-assisted invention”. Part II and Part III will investigate each sub-category. Part IV argues that patent protection of AI *per se* is necessary to promote innovation on AI rather than innovation by AI. In Part V, we conclude that no legal change should be made on inventorship for both inventions (‘Option 0’).

Part I Clarifying the Definition of AI-devised inventions

The question of whether patent law should recognise AI inventorship has reignited from some recently filed patent applications where the applicant named an AI system (DABUS) as an inventor. Different national courts gave this question opposite answers.³² While the UK³³ and the US³⁴ courts declined to grant the inventorship for an AI, the Australian counterpart sided with the patent applicant for the reason that³⁵ not giving inventorship to AI “would inhibit innovation not just in the field of computer science but all other scientific fields which may benefit from the output of an artificial intelligence system”.³⁶ Most recently, the EPO and the German Patent Office also refused to grant the inventorship to DABUS.³⁷

Before delving into the question on AI inventorship, we argued that the meaning of “AI-devised invention” needs to be clarified. According to the UKIPO, there are different types of AI-related inventions.³⁸

	Copyright	Patents	Summary
AI assisted	Creation by a human author who uses AI as a tool	Invention devised by a human inventor using AI as a tool	Human uses AI as a tool
AI generated	Creation of a work generated by AI in circumstances such that there is no human author of the work.		Human is not identified
AI devised		Invention devised by AI inventor.	Significant contribution of AI, but human may or may not be identified

³² Summary of the DABUS state of play can be found here: <<https://www.ipstars.com/NewsAndAnalysis/the-latest-news-on-the-dabus-patent-case/Index/7366>>.

³³ *Thaler v The Comptroller-General of Patents, Designs and Trade Marks* [2021] EWCA Civ 1374.

³⁴ <<https://www.dwt.com/-/media/files/blogs/artificial-intelligence-law-advisor/2021/09/thaler-v-hirshfeld-decision.pdf>>.

³⁵ *Thaler v Commissioner of Patents* [2021] FCA 879, Federal Court (Australia).

³⁶ *ibid* [56].

³⁷ *Supra* note 32

³⁸ UK Intellectual Property Office, 'Consultation Stage Impact Assessment on Artificial Intelligence and Intellectual Property (2021)' <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1029930/impact-assessment.pdf>.

As can be seen from the above table, AI-devised invention is mainly made by an AI **with or without** identifiable human participation. That will lead to different legal implications based on which type of AI-related invention is used in a particular invention.

Part II AI-generated inventions

We argued that there should be no legal change regarding patent protection for AI-generated inventions or the inventorship rules for technical, legal, and moral reasons.

Technically, the inventorship issue is irrelevant since AI that is capable of autonomously generating inventions does not exist in reality yet. In an open letter, AI experts oppose “[t]he creation of a legal status of an “electronic person” for “autonomous”, “unpredictable” and “self-learning” robots”.³⁹ The technical ground of this opposition is that the autonomy of AI is an “overvaluation of the actual capabilities of” AI and “distorted by Science-Fiction”.⁴⁰ A survey result based on the estimation of experts indicates that it needs 142 years from 2020 to develop human-level AI.⁴¹ At least shortly, AI capable of autonomously inventing would be fictional. Therefore, granting inventorship to autonomous AI for AI-generated inventions has no factual ground.

At law, an “inventor” is not defined under the Patent Acts 1977. However, the fact that legislation does not expressly forbid autonomous AI from being an inventor does not permit an altogether contrived reading of the authorities.⁴² By extension, although the Patents Act 1977 does not *expressly* refute the proposition that bananas can be inventors, it would be ludicrous to suggest such legislative silence can be used to sanction all manner of alternative interpretations. The court’s approach in the United Kingdom is correct, as a consistent reading of the Act of a whole and the relevant authorities requires the inventor to be a person.⁴³

AI may be as intelligent as a human being, but this is insufficient to be a “person” under patent law. An autonomous AI may invent, but this is incapable of contributing to an invention under the patent doctrine, which is imbued with human-centred inventorship tests.⁴⁴ Normatively speaking, it is preferable that the inventor would be the human responsible, as AI is still subject to human supervision and there is currently no evidence of an existing super-intelligent, unsupervised AI system. The fact of human supervision, even at early training stages, could be sufficient to amount to the relevant “person” who is the “actual deviser”. This interpretation, however, departs from existing law.⁴⁵ This approach could be consistent with ‘Option 0’, however as it does not call for legislative amendment, but for a different application of the ‘actual deviser’ test by a higher court in relation to AI. It would also have the benefit of enabling case-by-case analysis of varied AI systems and applications.

³⁹ Robotics Openletter | Open Letter to the European Commission’ <<http://www.robotics-openletter.eu/>>.

⁴⁰ *ibid.*

⁴¹ ‘Surveys on Fractional Progress towards HLAI – AI Impacts’ <<https://aiimpacts.org/surveys-on-fractional-progress-towards-hlai/>> accessed 26 November 2021.

⁴² *ibid* at [118].

⁴³ *Stephen L Thaler v The Comptroller-General of Patents, Designs And Trade Marks* [2020] EWHC 2412 (Pat) at [45]. See Lord Justice Arnold in *Stephen Thaler and Comptroller General of Patents, Trade Marks and Designs* [2021] EWCA Civ 1374 at [116]; [120]–[123]. See further at Kim *et al.*, ‘Ten Assumptions About Artificial Intelligence That Can Misperceive Patent Law Analysis’ (August 1, 2021, Max Planck Institute for Innovation & Competition Research Paper No. 21-18) <<https://ssrn.com/abstract=3910332>>.

⁴⁴ Turing Test, Eva Stankova, ‘Human inventorship under patent law’ (2021) 80(2) CLJ 338.

⁴⁵ *Yeda Research and Development Co Ltd v Rhone-Poulenc Rorer International Holdings Inc* [2007] UKHL 43 [2008] R.P.C. 1 [20],

Morally, AI inventorship is also problematic. Inventorship will tie with legal responsibilities, enforcement, and litigation, which only a human can perform. Under the UK Patents Act 1977, inventors are entitled to compensation from their employers under certain circumstances.⁴⁶ Accepting AIs to be inventors will go too far at this moment as we will move beyond viewing the AIs as a tool but as a natural and legal person. That would represent a paradigm shift in revisiting the concept of human beings and the interrelation between technology and society. This shift will create a moral dilemma since human society has not prepared for it at the moral level underlying social norms.

Even giving autonomous AIs a specific legal status is still too challenging for patent laws and other areas of laws such as contract or tort. Such consideration comes with challenges. Can autonomous AIs act on their legal personality? Can they become contracting parties and thereby enforce their rights and obligations? Can autonomous AIs be “personally” liable and subject to litigation? How does an autonomous AI system support such liability, and how this could be done? Should it be rewarded for its work? Shall we tax its earnings if the system generates enough revenue for tax purposes?

There are examples of collisions caused by self-driving cars⁴⁷ and humiliating chatbots⁴⁸ that turned racist and engaged in hate speech. In those situations, the producers of such AIs took action to fix the unplanned consequences. That is in line with current legal frameworks. Article 12 of the United Nations Convention on the Use of Electronic Information in International Contracts states that a person (whether natural or legal) acting on behalf of a programmed computer is ultimately liable for any message generated by the machine. According to this interpretation, a subject when using AI as a tool, whether at fault or not, must compensate for damage caused by AI. Under EU Council Directive 85/374/EEC, a producer shall be liable for damage caused by a defect in his product.⁴⁹ Consistent with the EU Product Liability Directive, the UK Consumer Protection Act imposes strict liability on a producer for damage caused by a defective product. While current laws in other areas seem not to accept AIs as human beings, patent laws should not outpace others.

To sum up, the existence of autonomous AI has no technical basis soon. From both legal and moral perspectives, autonomous AI is not a person nor can be an inventor. Therefore, there should be no legal change regarding patent protection for AI-generated invention, nor the rules for inventorship.

Part III AI-assisted inventions

For AI-assisted invention, neither should inventorship be granted to automating AI. One significant difference between automation and autonomy is whether AI invents on its initiative.⁵⁰ Rather than generating invention autonomously, current AI systems merely offer “automating solutions to complex problems”.⁵¹ For decades, this automating AI has been widely applied in scientific and engineering research. Such broad application has emerged without the incentive from awarding automating AI with inventorship. It seems that the

⁴⁶ UK Patents Act 1977, Sec. 39-43

⁴⁷ <<https://electrek.co/2016/05/26/tesla-model-s-crash-autopilot-video/>>.

⁴⁸ <<https://mindmatters.ai/2018/08/the-new-politically-correct-chatbot-was-worse/>>.

⁴⁹ Council Directive 85/374/EEC of 25 July 1985 on the approximation of the laws, regulations and administrative provisions of the Member States concerning liability for defective products, Article 1.

⁵⁰ Peter Blok, ‘The Inventor’s New Tool: Artificial Intelligence - How Does It Fit in the European Patent System?’ (2017) 39 European Intellectual Property Review 69, 70.

⁵¹ *ibid* 444.

incentive to invest in AI roots in its excellent ability and potential in solving complex problems rather than its potential to be autonomous. Even without granting inventorship to automating AI, researchers will engage with the development and utilisation of automating AI anyway.

Even if the argument that only human beings can be considered as inventors is rejected, it is difficult to justify AI inventorship for AI-assisted inventions. It is a practical reality that the patent application often designates a select few individuals that do not describe the collective effort behind the invention. Why should automating AI be treated differently, and in fact, *better than* human beings in some cases by being named as an inventor? If automating AI cannot be an inventor, it logically follows that any AI-assisted invention is truly a human-devised invention. In principle, these inventions are capable of protection under patent law applying the normal rules.

In summary, since AI-assisted invention is a more precise term for the current innovation practice, it is suggested to replace the term “AI-devised invention” with “AI-assisted invention” for legal clarity. Moreover, for AI-assisted invention, there should be no legal change regarding patent protection, nor the rules for inventorship.

Part IV Promoting AI innovation

AI-generated inventions give rise to a legal, philosophical question on the incentive theory. If an AI does not respond to patent incentives, granting inventorship to it will not make any difference in innovation activity. A more realistic question is how to promote the innovation on AI *per se* and make AI technology widely available for different sectors, rather than how to encourage the innovation by AI.

Currently, patent protection is available for AI systems as computer-implement inventions, and as long as a technical purpose is served, AI and machine learning are patentable. However, the legal uncertainty and costs for obtaining AI patents are inhibitive due to the vagueness of the technical character requirement. Therefore, it is suggested that a more in-depth investigation of the technical character requirement for AI is imperative. However, such an investigation seems to go beyond the purpose of this consultation.

Conclusion

To conclude, the following suggestions are submitted:

- 1) Policy option 0 of making no legal change on inventorship is the most optimal in the four suggested options.
- 2) The term “AI-devised invention” renders confusing since it can include “AI-generated invention” and “AI-assisted invention”.
- 3) To encourage seeking AI protection under patent law, further study on the technical character requirement for AI is necessary.

Section B: Respondent information

A: Please give your name (name of individual, business or organisation).

Oxford Intellectual Property Research Centre, Oxford University

B: Are you responding as an individual, business or on behalf of an organisation?

1) Organisation – Oxford Intellectual Property Research Centre, Oxford University

C: If you are responding on behalf of an organisation, please give a summary of who you represent.

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Katarina.foss-solbrekk@law.ox.ac.uk or van-anh.le@law.ox.ac.uk

J: Would you like an acknowledgement of receipt of your response?

Yes