Artificial Intelligence and IP: copyright and patents

A call for evidence from Intellectual Property Office

About TAS-hub and TAS Node on Regulation and Governance

The UKRI TAS Hub (EP/V00784X/1), assembles a team from the Universities of Southampton, Nottingham and King's College London. The Hub sits at the centre of the £33M Trustworthy Autonomous Systems Programme, funded by the UKRI Strategic Priorities Fund. The vision of the programme is to enable the development of socially beneficial autonomous systems that are trustworthy in principle and trusted in practice by the public, government, and industry. The TAS Programme currently involves over 20 Universities, more than 130 researchers from over 10 disciplines engaging with over 180 Industry Partners. Read more about the TAS Hub here.

The UKRI TAS Node on Governance and Regulation (EP/V026607/1), explores how to devise a framework for the regulation of autonomous systems – to help them respond to complexities of the world they function in. We bring together computer science and AI specialists, legal scholars, AI ethicists, as well as experts in science and technology studies and design ethnography. Together, we are developing a novel software engineering and governance methodology.

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Annex – A Copy of response Form

Section A

Copyright – computer generated works (CGW)

1. ***Do you currently rely on the computer-generated works provision? If so, please provide details of the types of works, the value of any rights you license and how the provision benefits your business. What approach do you take in territories that do not offer copyright protection for computer-generated works?***

N/A.

2. ***Please rank these options in order of preference (most to least preferred) and explain why.***

2.1 The preferred option is '1', namely, to remove protection for computer generated works from the CDPA.[1] This is for several reasons. The category reflects a distinction without merit, is doctrinally incoherent, unnecessary and potentially harmful.

2.1.1 **A separate category for computer-generated works creates a distinction without merit,** a problem that would be amplified by any creation of a *sui-generis* or related rights category of "AI works". Being generated by a computer, or AI, is neither necessary nor sufficient to create the type of problem section 9(3) CDPA purports to solve. Human creators already use a wide range of AI based tools, some of them with possibly significant impact on their work, yet nobody suggests that AI is the creator. For instance, a writer who follows the stylistic suggestions made by an AI such as Grammarly does not then have his/her authorship of the literary work questioned. The issue is not the medium of generation, but to what degree the generation of work is *autonomous* and without (significant) human input. Autonomous generation, however, can be achieved by a huge variety of mechanical devices that are not in any meaningful sense computers, let alone AI, for instance a mechanical device that responds to changes in seismic vibrations and changes in wind direction and speed, which it then translates mechanically into a moving arm with a pen, generating images that will be unique, random and unpredictable without further human interference. There is no reason to treat a work generated by such a contraption any differently from one that achieves functionally the same result through symbolic processing of the same input. Conversely, the same techniques deployed by AI systems to achieve creativity have also been used by human creators in mechanistic ways, without calling the copyright status of the result into question. Algorithmic generation of music using paper, pencil, dice and a rulebook have been used since the 18th century in a way that renders the human the purely mechanistic executor of the algorithm, without further

[1] For a contrary view see Andres Guadamuz, 'Do Androids Dream of Electric Copyright? Comparative Analysis of Originality in Artificial Intelligence Generated Works' in Jyn-An Lee, Reto Hilty and Kung-Chung Liu (eds), *Artificial Intelligence and Intellectual Property* (OUP, 2021), ch 7, pp. 147-176.

intellectual input, but their authorship was never challenged.[2] Using a digital random generator and a rule-based expert system instead of pen and dice also has no normative import. Similarly, many modern painters rely on random processes over which they have limited or no control. In these and similar cases, the decisive input by the artist comes at the moment of *selection* between the large number of generated works, and a judgement which of them, if any, is a result the operator is happy with. If this exercise of creative judgement is sufficient nexus between creator and an otherwise mechanistic and/or random process (and this has been the case for significant types of art), then it will also be possible to find in almost all situations of "computer generated" works sufficient human intervention, typically by the operator of the system. A highly undesirable side effect of singling out computer-generated works, and even more so labelling AI systems as "authors" is therefore also to mask the often significant, but less visible, human input in present and future AI systems.

It should also be noted that truly, fully autonomous generation of work remains a theoretical possibility, and in this analysis is *exceedingly rare*.[3] Maps generated by a robotic Mars explorer to communicate with other robots could be an example, or other AI processes where the generation of an output is a mere side-effect of what their developers or operators intended. However, as we will argue below, leaving these exceptional cases of fully autonomous creation *without* copyright, related rights or *sui generis* protection is beneficial and desirable.

2.1.2 **Section 9(3) of the CDPA is doctrinally incoherent and thus should be omitted.** The criterion of originality cannot be applied to computer-generated works because, regardless of whether the standard of "author's own intellectual creation"[1] or "labour, skill and judgment" is applied, originality focuses on the relationship between the (human) author and the work. According to sections 9(3) and 178 of the CDPA, computer generated works have no human author and therefore it is impossible to point to an author's creative choices or skill and judgment.[4] Instead, as commentators have suggested, the originality requirement would have to be either ignored or interpreted to mean something entirely different for this category of work.[5] Possible solutions have been proposed by commentators - Bently et al suggest asking whether the work is original in the sense that it is not copied from an earlier work, or whether it is novel, i.e., different from previous works.[6] Alternatively, McCutcheon has argued that "the criterion of originality would be applied on a hypothetical basis: if the work had been authored by a human, or if that human could be identified, would it be

[2] For a discussion of historical precursors and other non-computational generation of art see Burkhard Schafer, David Komuves, Jesus Manuel Niebla Zatarain, and Laurence Diver, 'A fourth law of robotics? Copyright and the law and ethics of machine co-production' (2015) 23(3) *Artificial Intelligence and Law* 217-240.

[3] We disagree, therefore, with commentators such as Jyh-An Lee, 'Computer-generated Works under the CDPA 1988' in Jyn-An Lee, Reto Hilty and Kung-Chung Liu (eds), *Artificial Intelligence and Intellectual Property* (OUP, 2021), ch 8, pp. 177-195, at 193 who argue that the "scale of autonomy and automation has gone far beyond what was imagined in the CDPA 1988".

[4] This is also why moral rights are inapplicable to computer-generated works: see ss 79(2)(7) and 81(2) CDPA.

[5] Guadamuz (2021), 160 refers to section 9(3) CDPA as "an exception to the originality requirements in copyright law".

[6] Lionel Bently, Brad Sherman, Dev Gangjee & Phillip Johnson, *Intellectual Property Law* 5th ed (OUP, 2018), 117.

original?".[7] However, these possible solutions have not, as yet, been adopted by the judiciary or by the legislature. In the absence of a doctrinally coherent test, it makes no sense to retain this category in its current form.

Another doctrinal difficulty is that the "author" of a literary, dramatic, musical or artistic work that is computer-generated work is defined as "the person by whom the arrangements necessary for the creation of the work are undertaken".[8] Yet, according to the very notion of computer-generated work, there cannot be a human author, which suggests that only legal persons could be authors of computer-generated works when, in fact, a human could be the person who makes those necessary arrangements.

Finally, the category of "computer-generated work" is inconsistent with EU copyright law.[9] Despite the UK's withdrawal from the EU, it is still desirable for the UK to maintain an approach consistent with the EU *acquis* and neighbouring EU Member States.

2.1.3 **From a policy perspective, copyright protection for computer-generated works, as authorial works, is unnecessary.** There is no evidence that creators rely significantly on the section 9(3) provision and, while this also means there is little harm in keeping it, the "costs" it brings in terms of unnecessary complexity can be avoided. Commentators have suggested that copyright protection through a provision such as section 9(3) CDPA is justified by virtue of incentivising investment in AI (and other software) technologies.[10] However, in the context of AI technology, we should be wary of assuming that additional incentives are needed to those that already exist. There are incentives which suffice to ensure the production of AI generated outputs, such as copyright (or, in some cases, patents) for the AI software, copyright or sui generis protection for the databases the software accesses, trade secrets protection for the data being used and technological and contractual protection measures applied to AI software and AI generated content.[11]

To the contrary, an automatic copyright for AI generated works could act as a *disincentive* for users to acquire AI technology and undermine the emerging business model of the typical software company. If there were any danger that by using AI, a writer has to share copyright with whoever developed the system, they will have a strong incentive *not* to use it – Grammarly's AI based style-improvement tools are only viable if they can so to speak "wash their hands" of the resulting text. From the AI-developer perspective, there are limited benefits to obtaining copyright in the resulting works and also additional costs, including the risk of liability for infringing uses if the

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[7] Jani McCutcheon, 'Curing the Authorless Void: Protecting Computer-Generated Works Following ICE TV and Phone Directories' (2013) 37 *Melbourne U.L. Rev*. 46, 51.
[8] This has been judicially interpreted only once in *Nova Productions Ltd v Mazooma Games Ltd* [2006] EWHC 24, [105] as referring to the person who designed and programmed the software (in this case a primitive video game) and excluding the user of the software.
[9] Madeleine de Cock Buning, 'Autonomous Intelligent Systems as Creative Agents under the EU Framework for Intellectual Property' (2016) 7 *Eur. J. Risk Reg.* 310, 320.
[10] Julia Dickenson, Alex Morgan & Birgit Clark, 'Creative Machines: Ownership of Copyright in Content Created by Artificial Intelligence Applications' (2017) 39 *European Intellectual Property Review* 457; Toby Bond and Sarah Blair, 'Artificial Intelligence and Copyright: section 9(3) or Authorship without an Author' (2019) 14 *Journal of Intellectual Property Law and Practice* 423.
[11] T Aplin and G Pasqualetto, 'Artificial Intelligence and Copyright Protection' in R.M. Ballardini, P. Kuoppamaki and O. Pitkanen, *Regulation Industrial Internet Through IPR, Data Protection and Competition Law* (Kluwer, 2019), ch 5, pp. 92-93.

works that are created happen to be infringing. If, exceptionally, an AI developer wants to offer a license to use their product *and* receive financial rewards for any work then created by the product, this can be adequately assured through the contractual terms of the license.

2.1.4 **From a policy perspective, there are also concerns about the harmful effects of copyright (or indeed related rights or *sui generis*) protection in autonomous outputs of AI systems**. While there is little legitimate interest for AI developers to acquire the copyright in the outputs of their system, there is also concern about possible illegitimate use, in particular AI facilitated "copyright trolling". That was the theme of the Qentis art project by the Austrian artist Marcovici, and while his performance would have faced both legal and technological challenges if used as a real business model, the public response to it showed that there is interest in using catalogues of AI generated work to then threaten (ultimately unjustified, but difficult to disprove) litigation of bona-fide creators of similar works.[12]

Further, "copyright stockpiling"[13] of the outputs created by AI would create obstacles to re-use of such content. If truly fully automated in its generation, the content will frequently not be traceable to an owner (so "orphan"), or the volume of content may be such that established channels of obtaining permission (e.g. via collecting societies) are no longer feasible. Therefore, it is preferable *not* to protect the literary and artistic content autonomously generated by AI by copyright.[14]

2.2 The next preference is Option 0: do nothing. As noted above, section 9(3) CDPA appears to have had little impact in real life, which also means it may not be creating obvious harms. Indeed, a proper understanding of the limitations of AI means that option 1 and option 0 will almost always come to the same result: as long as there is a clearly identifiable human input, even if it is not much more than the making of an artistic judgement that singles out some of the computer outputs from others, normal rules of copyright apply and we have to ask – for computers just with any other tool – if the way the creator used the tool gave rise to a work of sufficient originality. If there is no such human, then it will be equally difficult under section 9(3) to identify the person who took the steps necessary to create the work.

2.3 Option 2: **Replace the current protection with a new right of reduced scope/duration is not a logical consequence of repealing section 9(3) of the CDPA.** Any new right, whether a related right in the CPDA or *sui generis* in nature, would have to be justified. The only justification that would be relevant here is one of investment in AI/software technologies. However, as discussed above (2.1.3), it is questionable whether such additional incentives are needed to stimulate investment

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[12] D. Komuves, J.N. Zatarain, B. Schafer, & L. Diver, 'Monkeying Around with Copyright: Animals, AIs and Authorship in Law' (2015)16 *Jusletter IT* 1-27, also available as CREATe Working Paper 2015/2 https://www.create.ac.uk/publications/monkeying-around-with-copyright-animals-ais-and-authorship-in-law/.

[13] Robert Yu, 'The Machine Author: What Level of Copyright Protection Is Appropriate for Fully Independent Computer-Generated Works?' (2017) 165 *University of Pennsylvania Law Review* 1245, 1261.

[14] See also Daniel J. Gervais, 'The Machine as Author' (2020) 105 *Iowa L. Rev* 2053; Amir. H. Khoury, 'Intellectual Property Rights for Hubots: On the Legal Implications of Human-like Robots as Innovators and Creators' (2017) 35 *Cardozo Arts & Ent. L.J.* 635 and Lee (2021), 190-192 and Yu (2017).

in AI technology. Other IP incentives exist, moreover, there is nothing to suggest that there is under-investment in AI technology.[15] There would need to be a very strong empirical basis to introduce a new right and this evidential basis does not exist at present. Moreover, as discussed above, there may be harmful effects to protecting autonomously generated AI content (2.1.4).

3. ***If we introduce a related right for computer-generated works, as per option 2, what scope and term of protection do you think it should have? Please explain how you think this scope and term is justified in terms of encouraging investment in AI-generated works and technology.***

3.1 As stated in 2.3, we do not think it is desirable to pursue option 2, even if the category of computer-generated works in section 9(3) CDPA is repealed. However, if such an option was pursued, it would be vital to ensure that over-protection does not arise. This could be achieved in two ways. The first would be to offer a very limited term of protection (5 years or less). This would at least, for current applications, also correspond to the typical business model of AI generated works, which outcompete humans in terms of speed and volume, and as a result are strongest when works of limited shelf life – for instance short news reports – are generated. Second, to limit the scope of protection to literal copying of the AI-generated work. Such protection would be consistent with the level of protection given to related rights under the CDPA (e.g. sound recordings, typographical arrangements of published editions and broadcasts).

4. ***What are your views of the implications of the policy options and of AI technology for the designs system?***

No comment.

5. ***For each option, what are your views on the risk that AI generated works may be falsely attributed to a person?***

5.1 The above comments in our submission make clear that it is rare for there to be truly autonomous AI generated outputs and that, where they do exist, it is more appropriate for them to form part of the public domain than to be protected by copyright, related rights or *sui generis* right. For the vast majority of content that is created using AI tools, it is likely this will be copyright protected given the low threshold for protection (see 2.1.1). In which case, the use of © notices will put end-users on notice that copyright is claimed in the work and, thanks to section 104 of the CDPA, it is presumed that the person whose name appears on the work purporting to be the author is in fact the author, unless proved otherwise. This would also fit with the notion discussed above (2.1.1) that "claiming" a computer output as work is legitimate part of the creative process.

5.2 To the extent that a person claims copyright in content created using AI (as a tool) where they are not the author or the originality threshold is not met, then the mechanisms within the CDPA are sufficient. These mechanisms include challenging

[15] Lee (2021), 191 observes that "global investment in AI technology has increased dramatically in the past decade".

whether copyright subsists or, if someone claims to be the rightful author, relying on an infringement of attribution right or seeking a declaration that they are the author.

5.3 In the case, however, of computer-generated works under section 9(3) CDPA, the right of attribution does not apply. Moreover, for fully autonomously created works, there would be no attribution right because of the absence of human author. The concern reflected by the above question seems to be that a person might (wrongly) claim to have copyright in AI autonomously generated content and, as we noted above, seek to "abuse" this through copyright "trolling" or "stockpiling".

5.4 Where a person is named (incorrectly or falsely) as the author of AI generated content that is a literary, dramatic, musical, artistic or film work, that person may claim false attribution, pursuant to section 84 CDPA. The provision is aimed at preventing misrepresentation, but would be of limited use where a person is content to be falsely attributed as the author of an autonomously generated work and there is, in fact, no actual author. In other words, section 84 CDPA only gives standing to the person who is falsely attributed (if they object) and not to *any* person who objects to the false attribution of authorship. Therefore, if the concerns about false attribution are sufficiently strong (which we doubt) then one solution is for section 84 to be amended to give anyone standing to object to misrepresentation of authorship. Others have suggested technological solutions, such as embedding watermarks in machine-authored outputs[16] to make clear the AI generated provenance of the work.

Copyright – text and data mining (TDM)

6. ***If you license works for TDM, or purchase such licences, can you provide information on the costs and benefits of these? For example, availability, price-point, whether additional services are included or available, number and types of works covered by the licence etc.***

   N/A.

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

   No comment.

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

   No comment.

9. ***If you have experience of the EU exception with opt out for rights holders, how has this affected you?***

   No comment.

[16] Yu (2017), 1266.

10. ***How would any of the exception options positively or negatively affect you? Please quantify this if possible.***

No comment.

Patents

11. ***Please rank these options in order of preference (most to least preferred) and explain why?***

11.1 The preferred option is Option 0: make no legal change. There are two key reasons to support maintaining the status quo. The first is to remain in step with principle and practice in other leading patent jurisdictions. The United States and the European Patent Office do not recognise the possibility of non-human inventors and the United Kingdom should continue to apply the principle of human inventorship,[17] as held recently by the Court of Appeal of England and Wales,[18] in order to keep in step with these major patent jurisdictions.

Second, it does not seem that there is a problem with AI innovation under the existing patent law framework. There is no evidence that the lack of recognition of AI as inventor has hindered the development of AIs aimed at assisting innovation.[19] On the contrary, the field is thriving.[20] As well, it is not clear that the outputs of AI systems need to be protected by patents, as opposed to the "potentially significant investment, expertise and also creativity needed to identify those outputs that can be turned into a product, and in the testing, prototyping and developing that idea".[21] And this will invariably involve human endeavour.

11.2 Option 1: "Inventor" expanded to include humans responsible for an AI system which devises inventions is not desirable. The main reason is that this option rests on the wrong assumption, namely, that AI is able autonomously to generate patentable inventions. Whereas, the reality is that we have generic AI that may be useful for innovators, but far removed from the eventual product. The developers of these generic AI tools are unlikely to have any interest in the end results of how their systems are used. There are also custom-made AI tools as part of the research process. Modern research frequently takes place in teams and these specific AI tools are developed as part of a targeted research agenda. In these situations, the inventor and the AI developer become one and the same person. There is simply no

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[17] *Thaler v. Hirshfeld*, 1:20-cv-903(LMB/TCB) (E.D. Va. Sep. 2, 2021) (United States) and https://www.epo.org/law-practice/case-law-appeals/communications/2021/20211221.html (European Patent Office). For a comparison of the 'DABUS' cases brought by Thaler in several jurisdictions see Pheh Hoon Lim and Phoebe Li, 'Artificial Intelligence and Inventorship: Patently Much Ado in the Computer Program' (copy held on file).

[18] *Thaler v Comptroller General of Patents Trade Marks and Designs* [2021] EWCA Civ 1374, 21 September 2021.

[19] See Erica Fraser, 'Computers as inventors-legal and policy implications of artificial intelligence on patent law (2016) 13: 3 *SCRIPTed* 305.

[20] Yang, Xin, Yifei Wang, Ryan Byrne, Gisbert Schneider, and Shengyong Yang. 'Concepts of artificial intelligence for computer-assisted drug discovery' (2019) 119(18) *Chemical reviews* 10520-10594 (available at https://pubs.acs.org/doi/10.1021/acs.chemrev.8b00728) and Muratov, Eugene N., et al. 'A critical overview of computational approaches employed for COVID-19 drug discovery' (2021) 16 *Chemical Society Reviews* (available at: https://pubs.rsc.org/en/content/articlelanding/2021/cs/d0cs01065k) indicate that the barriers are technological, as opposed to legal. More generally, see *WIPO Technology Trends 2019: Artificial Intelligence*.

[21] Burkhard Schafer and Erica Fraser, 'Self-made (machine) men: IP implications of inventions by robots', *Trends and Communities of Legal Informatics: Proceedings of the 20th International Legal Informatics Symposium IRIS 2017*. Weblaw AG, Bern, 2017 (copy held on file).

need to single out one type of tool-making team member from the others who are contributing to the invention.

11.3 Option 2: allow patent applications to identify AI as inventor is clearly not a sensible option. It would place the UK out of step with major patent offices around the world, which do not recognise the possibility of non-human inventorship.[22] Even if AI is recognised as the inventor in the UK, it would not be recognised in many other jurisdictions, and so the usefulness of such a reform would be highly questionable. While it is true that different approaches have recently been adopted in Australia and South Africa,[23] these patent markets are not nearly as important as those in the United States and Europe. Moreover, the lack of consistency in approach between jurisdictions means that in using mechanisms to facilitate international patenting, such as Convention priority or making PCT applications, the default will be naming human inventors, as opposed to a practice of naming non-human inventors. It is not logically possible or credible to name both a human and non-human inventor and therefore, the default will be to name the inventor that complies with the majority of patent jurisdictions in which protection is sought.

Finally, being an inventor has not only rights, but also duties – in particular, the inventor can be asked to give evidence if a patent is challenged. The type of "explainable AI" that would allow the systems currently used to assist inventors does not exist yet and would be difficult to build. The alternative option of expert forensic examination of the AI may not be able to get equivalent results due to the way in which machine learning changes the operation of the system over time

11.4 Option 3: protect AI-devised inventions through a new type of protection is highly undesirable. The history of IP law demonstrates that *sui generis* protection is unwise. First, there is a substantial risk that any *sui generis* scheme remains an outlier, without international imprimatur or other jurisdictions adopting it, as has been the case with the database right introduced by the EU Database Directive.[24] As is well known, an international treaty on *sui generis* database protection failed at the WIPO Diplomatic Conference in 1996 and no other market, including the United States, which was the major economic market for databases at the time, adopted similar protection.[25] This was despite the mechanisms in the Database Directive to encourage reciprocal *sui generis* database protection.[26]

Second, there is a real risk that any *sui generis* protection becomes outdated or fails to serve its desired economic purpose. This has been the case with the EU *sui generis* database report, according to the EU Commission's own evaluation.[27] This risk is also demonstrated by the *sui generis* protection that was introduced for semi-conductor

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[22] *Thaler v. Hirshfeld*, 1:20-cv-903(LMB/TCB) (E.D. Va. Sep. 2, 2021) (United States) and https://www.epo.org/law-practice/case-law-appeals/communications/2021/20211221.html (European Patent Office).
[23] *Thaler v Commissioner of Patents* [2021] FCA 879 (Australia) and https://ipkitten.blogspot.com/2021/08/artificial-intelligence-system-as.html (discussing the situation in South Africa, noting there is no substantive examination of patents in South Africa).
[24] Directive 96/9/EC [1996] OJ L77/20.
[25] For discussion see Mark J. Davison, *The Legal Protection of Databases* (CUP, 2009), ch 6.
[26] Art 11 Database Directive.
[27] Study in support of the evaluation of Directive 96/9/EC on the legal protection of databases: Final Report (2018).

chips in the United States and elsewhere. Radomsky[28] analyses how, despite the early adoption of semi-conductor chip protection in the U.S. and in other major economic markets, and at the international level, this *sui generis* protection became quickly redundant because chip piracy was reduced through a combination of economic and technological barriers.Therefore, we should learn lessons from these past experiences and be extremely reluctant to introduce *sui generis* AI protection.

12. *Would the changes proposed under Options 1, 2 and 3 have any consequential effects on the patent system, for example on other patentability criteria?*

12.1 As we have argued, the preferred Option is 0: make no legal change. Inventorship is not the real or important issue when it comes to AI and patents (this is an unfortunate perception which seems to have been exacerbated by the *Thaler* litigation)[29] and is simply a distraction from more important concerns which are at stake in this area and that have been detailed by commentators, such as Erica Fraser and Burkhard Schafer.[30]

12.2 One key concern is that AI may autonomously generate vast amounts of prior art. Fraser and Schafer give the example of Cloem, whereby variants of existing patent claims can be proliferated. This could make it more difficult for inventions to satisfy the requirements of novelty and inventive step if there is a flood of AI generated prior art. This, in turn, could undermine the validity of existing patents and increase the burden on patent examination offices.[31]

12.3 Other challenges will arise as AI becomes an integral tool in innovation. The notional person skilled in the art will need to "reflect the contemporary inventor and the inventive technology typically used" and this will "likely disadvantage human inventors who do not make use of AI"[32]. On the other hand, the obviousness standard could become tougher in light of these changing inventive practices. Fraser writes: "technological advances could have a limiting effect on the patentability of inventions arrived at through repeated trial-and-error or data mining, whether conducted by human effort or through AI…" and affect the inventiveness standard for combination inventions.[33]

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[28] Leon Radomsky, 'Sixteen Years After The Passage Of The U.S. Semiconductor Chip Protection Act: Is International Protection Still Working?' (2000) 15 *Berkeley Technology Law Journal* 1049, esp. 1076 et seq.

[29] Here it is also interesting to note that Fraser (2016), 317-318 characterises DABUS as a *tool* rather than as an autonomously generating invention.

[30] See Burkhard Schafer and Erica Fraser, 'Self-made (machine) men: IP implications of inventions by robots', *Trends and Communities of Legal Informatics: Proceedings of the 20th International Legal Informatics Symposium IRIS 2017*. Weblaw AG, Bern, 2017 and Erica Fraser, 'Computers as inventors-legal and policy implications of artificial intelligence on patent law (2016) 13: 3 *SCRIPTed* 305.

[31] Fraser (2016), 307-314 and Schafer & Fraser (2017).

[32] Fraser (2016), 320.

[33] Fraser (2016), 321.

For options 1 and 2:

13. ***If UK patents were to protect AI-devised inventions, how should the inventor be identified, and who should be the patent owner? What effects does this have on incentivising and rewarding AI-devised inventions?***
14. ***In considering the differences between options 1 and 2, how important is it that the use of AI to devise inventions is transparent in the patent system?***
15. ***Would the UK adopting option 2 affect your global patent filing strategy, if so, how?***

As neither of these options are supported, no comments are made on how they should be implemented.

For option 3:

16. ***What term and scope of protection should a new right offer?***
17. ***What should the criteria for grant of a new right be and why? Particularly should it:***
    a) ***Replicate the current requirements for a patent?***
    b) ***Set a different bar for inventive step?***
    c) ***Be an automatic or registered right?***

As this option is strongly opposed, no comments are made on how it should be implemented.

General

18. ***What role does the IP system play in the decision of firms to invest in AI?***

18.1 This question is premised on utilitarian or economic justifications for IP.[34] The role of such justifications has been theoretically explored by commentators,[35] who observe that "AI innovation appears to be thriving".[36] Hilty et al argue that there is a questionable basis for IP protection of AI tools and a possible basis for IP protection of *some* AI outputs.[37] They argue that in the case of AI tools, there is no need for IP protection because of the reliance on data exclusivities, factual control of AI parameters (weights, in the case of machine learning), and the difficulty of reverse engineering.[38] Moreover, the innovation market for AI seems highly dynamic and "typically entail[s] incremental innovations that do not require enormous investments"[39]. In the case of AI outputs, Hilty et al argue that greater caution is needed because of the scarcity of factual controls and the "life expectancy of AI

[34] The relevance of deontological justifications for IP protection of AI is highly questionable: see Reto M. Hilty, Jörg Hoffmann, Stefan Scheuerer, 'Intellectual Property Justification for Artificial Intelligence' in Jyn-An Lee, Reto Hilty and Kung-Chung Liu (eds), *Artificial Intelligence and Intellectual Property* (OUP, 2021), ch 3, pp. 55-58.
[35] There are no empirical analyses as yet.
[36] Hilty et al (2021), 62.
[37] Hilty et al (2021).
[38] Ibid, 62-70.
[39] Ibid, 65.

outputs actually may be completely detached from fast moving innovation cycles of AI tools"[40], such that threats to recouping investment are more significant. This, however, needs to be contextually assessed. As a result, more empirical evidence is needed to judge whether certain AI outputs that are truly autonomously generated are sufficiently incentivised by IP rights.

19. ***Does the first mover advantage and winner-take-all effect prevail in industries adopting AI? How would this affect the impact of the policy options proposed on innovation and competition?***

No comment.

20. ***How does AI adoption by firms affect the economy? Does the use of AI in R&D lead to a higher productivity?***

No comment.

21. ***Do the proposed policy options have an impact on civil society organisations? If so, what types of impacts?***

No comment.

Section B: Respondent information

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

Prof. Tanya Aplin - Co-Investigator of the Trusted Autonomous Systems Hub and Professor of Intellectual Property Law at Dickson Poon School of Law, King's College London;
Prof. Berkhard Schaffer - Co-Investigator of Trusted Autonomous Systems Node on Governance and Regulation and Professor of Computational Legal Theory, School of Law, University of Edinburgh;
Dr Phoebe Li - Co-Investigator of Trusted Autonomous Systems Node on Governance and Regulation and Senior Lecturer in Law, Sussex Law School, University of Sussex.

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

1) Business – please provide the name of your business
2) **Organisation – UKRI funded Trusted Autonomous Systems Hub (https://www.tas.ac.uk/) and Trusted Autonomous Systems Node on Governance and Regulation (https://governance.tas.ac.uk/)**
3) Individual – please provide your name

[40] Ibid, 67.

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

The **UKRI Trusted Autonomous Systems (TAS) Hub** assembles a team from the Universities of Southampton, Nottingham and King's College London. The role of the TAS Hub is to co-ordinate and work with six research notes to establish a collaborative platform for the UK to enable the development of socially beneficial autonomous systems that are both trustworthy in principle and trusted in practice by individuals, society and government.

The **UKRI Trusted Autonomous Systems (TAS) Node on Governance and Regulation** brings together computer science and AI specialists, legal scholars, AI ethicists, as well as experts in science and technology studies and design ethnography. The node is developing a novel software engineering and governance methodology that includes new frameworks that help bridge gaps between legal and ethical principles (including emerging questions around privacy, fairness, accountability and transparency).

D: If you are an individual, are you?

1) General public
2) An academic
3) A law professional
4) A professional in another sector – please specify
5) Other – please specify

E: If you are responding on behalf of an organisation, are you?

1) An academic institution
2) An industry body
3) A licensing body
4) A rights holder organisation
5) **Any other type of organisation - please specify – academics working at their respective universities as part of a research project funded by UK Research and Innovation (UKRI).**

F: If you are responding on behalf of a business or organisation, in which sector(s) do you operate? (choose all that apply)

1) Agriculture, forestry and fishing
2) Mining and quarrying
3) Manufacturing – Pharmaceutical products
4) Manufacturing – Computer, electronic and optical products
5) Manufacturing – Electrical equipment
6) Manufacturing – Transport equipment
7) Other manufacturing
8) Construction
9) Wholesale and retail trade; repair of motor vehicles and motorcycles
10) Transportation and storage
11) Information and communication – Publishing, audio-visual and broadcasting
12) Information and communication – Telecommunication
13) Information and communication – IT and another Information Services
14) Financial and insurance activities

15) Real estate activities
16) Scientific and technical activities X
17) Legal activities X
18) Administrative and support service activities
19) Public administration and defence
20) Education
21) Human health and social work activities
22) Arts, entertainment and recreation
23) Other activities – please specify

G: How many people work for your business or organisation across the UK as a whole? Please estimate if you are unsure.

1) Fewer than 10 people
2) 10–49
3) 50–249
4) 250–999
5) 1,000 or more

H: The Intellectual Property Office may wish to contact you to discuss your response. Would you be happy to be contacted to discuss your response? **Yes.**

I: If you are happy to be contacted by the Intellectual Property Office, please provide a contact email address. **tanya.aplin@kcl.ac.uk**

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