

Impact of Artificial Intelligence on IP Policy

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Commenting in a personal capacity

1. Background

The current submission will concentrate on the subject of copyright, and specifically on Issue 6 (Authorship and Ownership).

While it is not the intention of this response to be technical in nature, but it is important to frame what we mean by artificial intelligence in the context of copyright creation. What we have come to understand as AI-generated works is a combination of machine learning algorithms that allow sophisticated autonomous and semi-autonomous programs to generate works such as creative works such as art, music, computer games, photography, and literary works.

We are seeing an explosion of such works around the world, and some are displaying interesting levels of complexity. However, sometimes the power of the machine to come up with art and music unprompted tends to be exaggerated, and while some algorithms can produce very good text with a little prompt, there is usually a lot of work in the background.

An example of this has been the publicised AI painting called Edmond de Belamy,¹ which made the news when it was sold in an auction for \$432,500 USD.² The painting was made by the French art collective Obvious using a machine learning algorithm designed specifically to generate images, known as a Generative Adversarial Network (GAN). The artists fed the AI over 15,000 portraits from various epochs, and produced a set of portraits of the fictional Belamy family. The GAN algorithm used by Obvious was created by researcher Ian Goodfellow,³ and this program was in turn used by a researcher in Stanford University called Robbie Barrat, who trained a version of GAN and listed the results in the open source github. Obvious used some of this work to learn how to create the Belamy family of portraits.

It is evident that modern AI creativity is not a matter of a machine producing work on its own, but involves a lot of hard work from a myriad of developers, researchers and artists. This will be at the heart of the argument that will be presented in this submission.

As a manner of a short introduction as to my expertise, I have been writing and presenting on this subject for several years. My interest came as a result of the increased capability of computer-generated art by the means of artificial intelligence, and it started with blog posts and conference papers in 2014, culminating with the publication in 2017 of the

¹ <https://obvious-art.com/edmond-de-belamy.html>.

² Dellinger A J, 'AI-generated painting sells for \$432,000 at auction' (October 25 2018) Endgadget <http://tinyurl.com/tsu4nd>.

³ Found here: <https://github.com/goodfeli/adversarial>.

paper “Do Androids Dream of Electric Copyright? A ”.⁴ A shorter version of the paper was published in WIPO Magazine.⁵ I have finished a follow-up paper looking at the liability aspect of AI and algorithmic decision-making mechanisms, which will be sent for peer-review shortly.

This response will make use of both the published and unpublished materials in the aforementioned articles.

2. AI and copyright ownership (Issue 6)

2.1 Framing the answer

The subject of copyright ownership of works produced by artificial intelligence has had a relatively short life, but it has already produced a significant amount of scholarship and commentary on the subject,⁶ although a minimal amount of case law and policy action. Several high-profile and widely publicised artworks such as *The Next Rembrandt*,⁷ and *Edmond de Bellamy*, have caught the imagination of many, providing an insight into a near future in which the production of works with the assistance of artificial intelligence will become more sophisticated.

At the heart of the question is the issue of whether there should be some sort of copyright protection for works that have been autonomously generated by artificial intelligence. This is a binary choice, either there is protection, or there is not. However, if we assume that there is protection, the shape of such has to be determined, and various options could be on the table.

The default position, and the one that seems to have more scholarly support,⁸ is that these works should go into the public domain either because only a human can create a work, or because there cannot be originality in a work that has not been created by a human, and without originality there is no copyright.

The second option is that AI-generated works should have some sort of protection, and not only that, it is already recognised in some jurisdictions. This is the option that will be favoured in this submission. Just briefly, this paper’s position is that in many legal systems, copyright law allows for computer-generated works to receive copyright protection, and it is contended that AI works would fall under this category. This would mean that such works are under protection as any other copyright work. This proposal bypasses the issue of authorship as such, and makes it one of originality. If the work is original in compliance with the definition

⁴ Guadamuz A, ‘Do Androids Dream of Electric Copyright? Comparative Analysis of Originality in Artificial Intelligence Generated Works’ (2017) 2017 Intellectual Property Quarterly 169.

⁵ Guadamuz A, ‘Artificial Intelligence and Copyright’ (2017) 5:2017 WIPO Magazine https://www.wipo.int/wipo_magazine/en/2017/05/article_0003.html.

⁶ For an excellent literature review of some of this scholarship, see: Iglesias M, Shamulia S and Anderberg A, ‘Intellectual Property and Artificial Intelligence - A Literature Review’ (Publications Office of the European Union 2019) EUR - Scientific and Technical Research Reports <https://publications.jrc.ec.europa.eu/repository/handle/11111111/58660>.

⁷ <https://www.nextrembrandt.com/>.

⁸ See for example: Ramalho A, ‘Will Robots Rule the (Artistic) World? A Proposed Model for the Legal Status of Creations by Artificial Intelligence Systems’ (2017) 21 Journal of Internet Law 12; and Ginsburg J and Budiardjo L, ‘Authors and Machines’ (2019) 34 Berkeley Technology Law Journal.

prevalent in that jurisdiction, then it will have protection. The question of authorship is therefore solved by simply allocating authorship to whoever made arrangements for the work to come into being.

There is another option for protection if it is decided that AI works should have copyright, and it is to create some form of *sui generis* right that covers only AI works⁹ This new right could be something akin to the European database right, and it would protect the economic investment that went into the creation of the work. These proposals haven't been implemented, and the previous two choices do not require much of a change in existing copyright law and doctrine, so these are preferred to the creation of new rights.

2.2 Advocating protection for AI works

If we go beyond the current paradigm that assumes that all works generated by AI fall in the public domain, then we need a system of protection that is capable of allocating authorship under these circumstances. Such a thing is already in existence in a few countries such as India, Ireland, New Zealand and the UK. This approach is best encapsulated in UK copyright law, section 9(3) of the Copyright, Designs and Patents Act (CDPA), which states:

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

Furthermore, section 178 of the CDPA defines a computer-generated work as one that "is generated by computer in circumstances such that there is no human author of the work". The idea behind such a provision is to create an exception to all human authorship requirements by recognizing the work that goes into creating a program capable of generating works, even if the creative spark is undertaken by the machine.

This approach bypasses the human authorship question because it defines as the author the person who made the arrangements necessary for the work to be created, and therefore it rests on the assumption that the ownership of the work will go to the person who started that process. Assuming authorship allows us to concentrate on the really important question, that of originality. In other words, if the work would be original according to the prevailing definition in each jurisdiction, then the work will have protection, and this is an assessment that can only be undertaken on a case by case basis.

There is of course the problematic issue of whether an AI-generated work can meet the requirement of originality in the first place. For a system of protection that is supposed to be harmonised at an international level in order to promise predictability and ease of conducting business,¹⁰ it is remarkable that the concept of originality, one of the most basic elements of authorship, is in such a state of disharmony. We have various

⁹ This option has emerged mostly from a series Japanese strategy policy papers on the subject, see: Intellectual Property Strategy Headquarters, 'Intellectual Property Strategic Program' (2016), https://www.kantei.go.jp/jp/singi/titeki2/kettei/chizaikeikaku20160509_e.pdf.

¹⁰ See: Crews K D, 'Harmonization and the goals of copyright: Property rights or cultural progress?' 6 Indiana Journal of Global Legal Studies 117, at 117-118; and Judge E F, and Gervais D, 'Of silos and constellations: Comparing notions of originality in copyright law' (2009) 27 Cardozo Arts and Entertainment Law Journal 375.

international standards, from the EU's "the author's own intellectual creation",¹¹ to the US and the standard of a work needing to have "a modicum of creativity".¹² So every work generated by artificial intelligence will have to be measured over the local standard on a case by case basis. Let's say, if we train a machine learning algorithm to produce a painting, would all of the work that went into the training, namely the choice of inputs and the selection of outputs, be enough to convey originality? It will obviously depend on each jurisdiction, but it is easy to see how a work could be thought to be original if there is enough human input in the process that produced the work, regardless of whether the final output is the result of mere automated system.

Interestingly, China has been the first country where a court has applied a version of this idea.¹³ A court in the Chinese city of Shenzhen has recently decided that an article that was written by an artificial intelligence program has copyright protection. The article was written by Tencent's Dreamwriter AI Writing Robot,¹⁴ an internal code at the Chinese tech giant that produces half a million articles per year since 2015 in subjects such as weather, finance, sport, and real estate. The case involved the Shanghai Yingxun Technology Company, which copied and published one of the Dreamwriter authored articles, which prompted Tencent to sue for copyright infringement. The court sided with Tencent and ordered Yingxun to pay 1,500 yuan (\$216 USD) in damages.

This is extremely relevant to this question, but it is also the first legal case in the world involving a copyright work authored by a sophisticated AI. The defendants tried to claim that the work was not protected by copyright as it was not authored by a human being, and therefore would be in the public domain and it could be used by anyone. However, the court decided that "the article's form of expression conforms to the requirements of written work and the content showed the selection, analysis and judgement of relevant stock market information and data." Moreover, "the article's structure was reasonable, the logic was clear and it had a certain originality." In other words, it fulfilled the requirements for copyright protection.

This is confirmation that it is viable to bypass the human authorship argument, and that we should make this a question of originality, and that such requirement should be considered on a case by case basis. As stated above, up until now the law has been ambiguous on this question, and for the most part it has been assumed that these works would be in the public domain as there is neither author nor originality. The relevance of the Chinese decision is that it considers directly whether the work is original, and if so, then it should be given protection.

But this case also uncovers one of the main reasons why we need an answer to the question of AI copyright authorship. A common question when discussing this subject tends to be a variation of "so what?" Surely, AI may produce some interesting works of art, or it could compose uninspired mechanical music, and even write a journalistic piece, but so what? It is true, artificial intelligence will not replace human musicians, artists and writers (at least in the short term), but that it is already being deployed precisely in

¹¹ Present in Case C-5/08 Infopaq International A/S v Danske Dagblades Forening [2009] ECR I-06569.

¹² Feist Publications, Inc. v. Rural Telephone Service Co., 499 U.S. 340 (1991) at 1288.

¹³ As reported here: Li Y, 'Court rules AI-written article has copyright' (January 9, 2020) China Daily Global, <http://www.ecns.cn/news/2020-01-09/detail-ifzsqcrm6562963.shtml>.

¹⁴ 'Tencent robots have written thousands of articles a day' (January 15 2019) International Intelligent Robot Industry News <http://en.ii-robot.com/news/show.php?itemid=611>.

situations as the one described above. AI can produce passable music,¹⁵ it can write low-information articles, and it can produce some novelty art such as the Belamy family. There has always been a market for some low quality and low cost content in all walks of the creative industries, and AI provides cost-effective tools to produce just that.

The assumption in the past was that none of these works had any copyright protection and therefore could be copied and reproduced by everyone in the world. While not all AI creators are interested in profiting from their AI investment using copyright, it is clear that a few tech companies are keen on at least not allowing competitors to profit from their AI investment. Tencent's suit is an attempt to stop a competitor from re-publishing its Dreamwriter articles for free.

2.3 Advantages of this proposal

There is scope for harmonisation in this area, and WIPO has the chance to help to spearhead such an endeavour. At the moment the best approach is to provide authorship to the person who made the arrangements necessary for the work to be created, and this will be examined in accordance to the rules on originality in each jurisdiction. This is both consistent with the existing law in various countries, as well as the Chinese Tencent case.

This approach has several advantages: it would bring certainty to an uncertain legal area; it has already been implemented internationally in various countries; it allows for each work to be analysed on a case-by-case basis; and it has been in existence for a relatively long time without much incident.

Moreover, a standard that allocates authorship to the person who made the necessary arrangements for a work to be made is consistent with existing law and case law. There is no need to change originality standards as such, we would only be creating an addendum that applies to works made by a computer.

This is better than the prevalent proposal to consider these works as not worthy of protection. While persuasive from a strictly doctrinal standpoint, there are various ways in which we can maintain the existing originality requirements, and still have some sort of protection for AI generated works.

Firstly, it is important to point out that the task of generating a work using AI is often not just a matter of pressing a button and letting the machine do all the work, someone has to program and teach the computer to compose music, write, or paint, and this is a process that is both lengthy and full of intellectual creativity. The makers of works of art such as The Next Rembrandt engaged in lengthy process, which could have enough "intellectual creation". On the other hand, you can go to a website¹⁶ that is implementing OpenAI's GPT-2 predictive text model,¹⁷ prompt the program with an opening sentence, and obtain some text with the press of a button. This involves hardly any action that we would recognise as original, unless we think that copying and pasting a few words is enough to meet any originality standard, and therefore any resulting work would not

¹⁵ <https://www.aiva.ai/>.

¹⁶ <https://taktotransformer.com/>.

¹⁷ Radford A et al, 'Language models are unsupervised multitask learners' (2019) 1:8 OpenAI Blog 9, https://cdn.openai.com/better-language-models/language_models_are_unsupervised_multitask_learners.pdf.

have protection. But more sophisticated AI need more training and more human input, and this could potentially be considered as carrying enough intellectual creation from the user.

Secondly, the current system relies on the concept of originality that is very human centric, be it the requirement of intellectual creation. The idea behind this is that the human creative spark itself is what imbues a work with protection. But we are perfectly happy allowing legal persons to be authors and copyright owners, granted, with the understanding that the works are created by humans, but why not continue having another legal fiction only for AI works?

Thirdly, originality used to subsist if the author had exercised enough skill, labour and judgement to warrant copyright protection.¹⁸ Why not go back to a similar system that rewards a “sweat of the brow” approach? While we have been moving away from these approaches, it might be worth reviewing the merits of recognising the amount of effort and investment that goes into the creation of some of these works.

Finally, there are a number of practical problems with allowing increasing numbers of AI works to co-exist with human works. It is possible that public domain AI works will result in some creators to go out of business, as they cannot compete with free works. Stock photography, jingles, music for games, journalistic pieces, all of these could be affected by increasingly sophisticated AI.

Moreover, there are even some worrying practical implications. Copyright has no registration, so a work is assumed to be protected if it meets the existing requirements. This assumption is often recognised by everyone, and it is not usually tested in court unless there is a conflict. The increasing sophistication of AI works will mean that there will be growing doubt as to the legitimate origin of works. Is this music created by a human or by an AI? How could you tell?

2.4 Who should own this right?

The above proposal does not answer part of the question, namely, who exactly is the person who made the arrangements necessary for the work to be created. One could argue that this would be the programmer, but it seems more likely that this should be determined on a case-by-case basis.

There is not a lot of case law in this area, but a good example can be found in the UK as well. The case is *Express Newspapers v Liverpool Daily Post*,¹⁹ in which the plaintiffs published a competition involving the distribution of cards to its readers, with each card having a sequence of five letters that were to be checked against the winning sequences published by the Express group newspapers. The winning sequences were published in a grid of five rows and five columns of letters. Because the players did not need to purchase the newspaper in order to obtain the cards, the Liverpool Daily Post reproduced the winning sequences in their newspapers. The plaintiffs sued seeking an injunction against this practice.

¹⁸ Rahmatian A, ‘Originality in UK Copyright Law: The Old “Skill and Labour” Doctrine Under Pressure’ (2013) 44 IIC 4.

¹⁹ *Express Newspapers Plc v Liverpool Daily Post & Echo Plc* [1985] 3 All E.R. 680.

The defendants contended that the published sequences were not protected by copyright because they had been generated by a computer, and therefore there was no author. Whitford J held that the computer was merely a tool that produced the sequences using the instructions of a programmer, so the plaintiffs were awarded the injunction. Whitford J commented:

*"The computer was no more than the tool [...]. It is as unrealistic as it would be to suggest that, if you write your work with a pen, it is the pen which is the author of the work rather than the person who drives the pen."*²⁰

This decision is consistent with s 9(3), but despite the apparent clarity of this argument, there is some ambiguity as to who the actual author is. Further discussion on this question seems to favour such an approach.

This decision is consistent with s 9(3), but despite the apparent clarity of this argument, there is some ambiguity as to who the actual author is. It has been pointed out that Whitford J's pen analogy could be used to adjudicate copyright ownership to the user of the program, and not to the programmer.²¹ It seems evident that the spirit of the law favours the later and not the former, but this is a persisting ambiguity that could have impact in a world where computer-generated works become more prevalent.

Let us use a word processor to illustrate why the existing ambiguity could prove problematic. It is evident that Microsoft, the makers of the Word programme, do not own every piece of work written with their software. Now imagine a similar argument with a more complex machine learning program such as the game *No Man's Sky*,²² where the system generates new worlds every time a player enters the program. If we use the word processor analogy, one would own all new worlds generated by the software because the user made "the arrangements necessary for the creation of the work". Yet clearly the game developers make a strong claim in their end-user licence agreement that they own all intellectual property arising from the game.²³

It is therefore necessary to seek clarification to this possible conundrum elsewhere. While discussing copyright reform that eventually led to the 1988 CDPA and the current wording of s9(3), the Whitford Committee had already discussed that "the author of the output can be none other than the person, or persons, who devised the instructions and originated the data used to control and condition a computer to produce a particular result."²⁴

Similarly, during the discussion of the enactment of the current law, the House of Lords discussed computer-generated in the context of exempting s 9(3) from the application of moral rights.²⁵ In that context, Lord Beaverbrook usefully commented that "[m]oral

²⁰ At 1098.

²¹ Adrian A, *Law and Order in Virtual Worlds: Exploring Avatars, Their Ownership and Rights* (Information Science Reference 2010).

²² <https://www.nomanssky.com/>.

²³ http://store.steampowered.com/eula/275850_eula_0.

²⁴ "Report of the Whitford Committee to Consider the Law on Copyright and Designs" (Cmd 6732, 1977) at para 513.

²⁵ HL Deb vol 493 col 1305 25 February 1988.

rights are closely concerned with the personal nature of creative effort, and the person by whom the arrangements necessary for the creation of a computer-generated work are undertaken will not himself have made any personal, creative effort."²⁶ This suggests that the law recognises that there is no creative input in computer-generated works, and therefore s 9(3) has been framed as an exception to the creativity and originality requirements for the subsistence of copyright. It is precisely this divorce with creativity what makes the UK's computer-generated clause so different to other jurisdictions.

Some commentators seem to be concerned about the ambiguity present both in the law and in *Express Newspapers*. Commentators have gone through the options of who owns a work produced by an artificial intelligent agent, weighing the merits of giving ownership to the programmer, to the user, to the agent itself, or to no one at all.²⁷ However, this apparent ambiguity could be solved simply by reading the letter of the law and applying it on a case by case basis. If the artificial agent is directly started by the programmer, and it creates a work of art, then the programmer is clearly the author in accordance to s 9(3) CDPA. However, if a user acquires a program capable of producing computer-generated works, and uses it to generate a new work, then ownership would go to the user.

This is already happening with Deep Dream images. After announcing the existence of the Deep Dream project, Google released its code²⁸ to the public as an open source program,²⁹ not claiming ownership over any of the resulting art. Any user can run the program and generate art using it, and it would seem counterintuitive to believe that Google should own the images, after all, the user is the one who is making the necessary arrangements for the creation of the work.

3. Conclusion

Things are likely to become yet more complex as use of artificial intelligence by artists becomes more widespread, and as the machines get better at producing creative works, further blurring the distinction between artwork that is made by a human and that made by a computer.

Monumental advances in computing and the sheer amount of available computational power may well make the distinction moot; when you give a machine the capacity to learn styles from large datasets of content, it will become ever better at mimicking humans. And given enough computing power, soon we may not be able to distinguish between human-generated and machine-generated content. We are not yet at that stage, but if and when we do get there, we will have to decide what type of protection, if any, we should give to emergent works created by intelligent algorithms with little or no human intervention. Although copyright laws have been moving away from originality standards that reward skill, labour and effort, perhaps we can establish an exception to that trend

²⁶ Ibid.

²⁷ Dorotheu E, 'Reap the benefits and avoid the legal uncertainty: who owns the creations of artificial intelligence?' (2015) 21 *Computer and Telecommunications Law Review* 85.

²⁸ <https://github.com/google/deepdream>.

²⁹ For more about open source software, see: Rosen L, *Open Source Licensing: Software Freedom and Intellectual Property Law* (Prentice Hall PTR 2004).

when it comes to the fruits of sophisticated artificial intelligence. The alternative seems contrary to the justifications for protecting creative works in the first place.

Granting copyright to the person who made the operation of artificial intelligence possible seems to be the most sensible approach, with the UK's model looking the most efficient. Such an approach will ensure that companies keep investing in the technology, safe in the knowledge that they will get a return on their investment.