IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Request for Comments on Intellectual Property Protection for Artificial Intelligence Innovation

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Docket No. PTO-C-2019-0038

COMMENTS BY INTEL CORPORATION

January 10, 2020

We thank the United States Patent and Trademark Office ("PTO") for this opportunity to submit comments on intellectual property protection for AI innovations. Intel shares the objective of the PTO to explore and harmonize different bodies of intellectual property laws for adequate protection of AI innovations. We welcome the PTO's effort to explore how AI innovations implicate different disciplines of intellectual property.

1. **Should a work produced by an AI algorithm or process, without the involvement of a natural person contributing expression to the resulting work, qualify as a work of authorship protectable under U.S. copyright law? Why or why not?**

As an initial matter, the abstract nature of this question may not elicit helpful comments. For example, it is not sufficiently clear when a work should be deemed to be created "without the involvement of a natural person contributing expression to the … work." At present, there is always some human being contributing to the content of an AI-generated work. This is because the AI algorithm or process can at least be traced back to the human beings who developed and trained the AI system. As Professor Jane Ginsburg has observed, "[e]ven the most sophisticated generative machines – those that employ adversarial neural networks to generate outputs – are no more than complex sets of algorithmic instructions whose abilities are entirely attributable to how programmers train them with input data, and how programmers instruct them to analyze that input data."[1] Other scholars have made similar observations.[2] At present, virtually all AI output

[1] Ginsburg & L. Budiardjo, *Authors and Machines*, 34 Berkley Tech. L. J., 343, 413 (initial proof dated October 21, 2019), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3233885.

[2] See, e.g., Arthur R. Miller, *Copyright Protection for Computer Programs, Databases, and Computer-Generated Works: Is Anything New Since Contu?*, 106 Harv. L. Rev. 977, 1049 (1993) ("[I]t is premature to consider the status of a work of expression that is truly the product of a computer's 'mind.' Indeed, it is questionable whether that type of creation will materialize within any time-frame worth considering. Today's 'computer-generated' works still have identifiable human authors, and that will be true for the foreseeable future. Therefore, the human element in the creation of these works is sufficient to sustain their copyrightability and resolve any question of authorship."); Annemarie Bridy, *Coding Creativity: Copyright and the Artificially Intelligent Author*, 2012 Stan. Tech. L. Rev. 1, 10 (2012) ("Even though today's computers are exponentially more powerful than their early ancestors in terms of memory and

will contain some modicum of human activity and/or creativity and could be copyrightable (see answer to question 2). When AI technology develops in in the future, the question may become more difficult if the AI algorithm or process produces truly unexpected or unforeseen creative works (sometimes called "emergent works"). In that scenario, it may be difficult to characterize the human programmers as "authors" under current precedent, in which case there may be no copyright in the work. Indeed, the copyright law protects only "the fruits of intellectual labor" that "are founded in the creative powers of the *mind*."[3]

2. **Assuming involvement by a natural person is or should be required, what kind of involvement would or should be sufficient so that the work qualifies for copyright protection? For example, should it be sufficient if a person (i) designed the AI algorithm or process that created the work; (ii) contributed to the design of the algorithm or process; (iii) chose data used by the algorithm for training or otherwise; (iv) caused the AI algorithm or process to be used to yield the work; or (v) engaged in some specific combination of the foregoing activities? Are there other contributions a person could make in a potentially copyrightable AI-generated work in order to be considered an ''author''?**

Intel generally supports the PTO's effort to create clear and stable guidance. And while deeming one or some of these events sufficient might create a clear rule, "[t]he circumstances under which computer-generated works are prepared seem too varied to permit a single solution" to this question.[4] The better approach would be to decide this question on a case-by-case basis, taking into account all relevant circumstances. For example, it would be incorrect to say it is *always* sufficient for a person to "cause[ ] the AI algorithm or process to be used to yield the work," since there may be cases where the user of the AI contributes insufficient creativity to be

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processing, they still rely on humans in the first instance to dictate the rules according to which they perform. Like the photographer standing behind the camera, an intelligent programmer or team of programmers stands behind every artificially intelligent machine. People create the rules, and machines obediently follow them—doing … only whatever we order them to perform, and nothing more.").

[3] *Trade-Mark Cases*, 100 U.S. 82, 94 (1879) (emphasis added).

[4] Bruce E. Boyden, *Emergent Works*, 39 Colum. J.L. & Arts 377, 383 (2016).

an author of the resulting work. This is consistent with federal case law. In *Torah Soft Ltd. v. Drosnin*,[5] for example, the district court held the user of a program that created a matrix of bible code was not the author of the matrix. The user would "merely input[ ] a word or phrase" as a term, and the program then supplied "the lion's share of the creativity" in producing the resulting matrix, making the developers of the program the authors.[6] Conversely, if the user of the program is responsible for the vast bulk of the creativity in the new work, and if the human programmer, rather than the user, did not envision or control the content and execution of that work, it would seem inconsistent to describe the human programmer as the author.[7]

Thus, the analysis should consider whether sufficient creativity comes from user input, program design, training, or some other contribution. Some scholars have also suggested that the concept of foreseeability may help determine whether the designer or user of a program should be deemed the author of the resulting output.[8] Considering this factor would seem more appropriate than assigning dispositive weight to one type of activity, without regard to its creative contribution.

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[5] 136 F. Supp. 2d 276 (S.D.N.Y. 2001).

[6] See also *Design Data Corp. v. Unigate Enter., Inc*. 847 F.3d 1169, 1173 (9th Cir. 2017) (noting the programmer's copyright in a software program "may extend to the program's output" – making the programmer the author of that output – "if the program 'does the lion's share of the work' in creating the output and the user's role is so 'marginal' that the output reflects the program's contents").

[7] See Boyden, supra, at 384; Ginsburg & Budiardjo, supra, at 408-11; see also *Rearden LLC v. Walt Disney Company*, 293 F.Supp.3d 963, 969-71 (N.D. Cal. 2018) (dismissing complaint where the plaintiff's software, which could be used by film studios, took two dimensional camera capture of scenes involving actors and created CG output, like the animal-like face of the Beast in *Beauty and the Beast*; in light of all the creative input from the actors, the district court found the plaintiff failed to properly allege that his program did "the lion's share of the work" or that the "user's input is marginal").

[8] See Boyden, supra, at 392 (arguing it may be appropriate to treat someone as the author of the output of a program if that person could "more or less" foresee the output of the system); Ginsburg & Budiardjo, supra, at 429-30 (arguing the designer of a program may be the author of the resulting output if he or she "could have anticipated what the downstream user would do to 'complete' the work").

As a final point, although copyright ownership controversies historically have faced the courts,[9] many disputes about ownership can be avoided by agreeing on copyright ownership in advance.

3. To the extent an AI algorithm or process learns its function(s) by ingesting large volumes of copyrighted material, does the existing statutory language (e.g., the fair use doctrine) and related case law adequately address the legality of making such use? Should authors be recognized for this type of use of their works? If so, how?

Current fair use precedent supports the creation of datasets from publicly available copyrighted material for non-expressive uses. As the question recognizes, many AI applications require copying of vast amounts of input, often including copyrighted content. One relevant case indicating this would likely be fair use in some cases is *Authors Guild v. Google, Inc*., 804 F. 3d 202 (2d Cir. 2015). There, the Second Circuit analyzed the relevant fair use factors and held it was fair use for Google to make a digital copy of millions of books for the purpose of creating a "full-text searchable database" that served as a reference tool. *Id*. at 216-17. The first fair use factor, the purpose and character of the use, weighed in favor of fair use: Although Google's use was commercial, copying the works for the purpose of making the reference tool was a "transformative use" of those works and was "different in purpose, character, expression, meaning, and message." *Id*. at 217. The second fair use factor, the nature of the work, was not found to weigh against fair use, since Google was using the works for their factual content, rather than for their creativity. *Id*. at 220. The third fair use factor, the amount and importance of the material copied, was also found to weigh in favor of fair use: Although Google copied the entirety of the works, this was "literally necessary" to achieve Google's transformative use of the works and to enable its search function. *Id*. at 221. The fourth fair use factor, the effect of the

[9] See, e.g., *Almuhammed v Lee*, 202 F.3d 1227 (9th Cir. 1999).

copying on the copyright owner's market for the works, also weighed in favor of fair use: Copying the works to create a searchable database did not serve as a substitute for the works themselves, nor did the "snippet" view provided to users of the database. *Id*. at 223. The court also rejected the notion that Google's use harmed the copyright owner's market for derivative works, reasoning there was no "exclusive [derivative] right to supply information about [the] work[s] of the sort communicated by Google's search functions." *Id*. at 226.

Another analogous case adopting similar reasoning is Judge Rakoff's decision in *White v. West Publishing Corp*.[10] There, a database consisting of legal briefs was created by West. West's clients used the database to explore how particular legal issues or factual situations had been addressed in briefs in the past, allowing them to develop legal arguments and locate authorities for their own cases or research. Judge Rakoff found West's use of the briefs to be fair use. West's use was transformative, i.e., created for a purpose different than the one envisioned by the authors of the briefs. Moreover, West added something new, by creating an interactive tool. Given that the briefs were "functional presentations of fact and law," the briefs were at the lower end of the creativity scale. Even though the entire briefs were copied, this amount of copying was necessary for the transformative purpose of West's use. Finally, West's use did not harm the market for the works, since it did not serve as substitute for the original work, and there was no lost licensing revenue in light of the prohibitive transactional costs in licensing attorney works.

The reasoning of these and other cases[11] supports the conclusion that the large-scale copying needed for non-expressive AI processes should be permitted as fair use. This is true

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[10] 29 F.Supp.3d 396 (S.D.N.Y. 2014).

[11] See, e.g., *Authors Guild v. HathiTrust*, 755 F.3d 87 (2d. Cir. 2014); *Kelly v. Arriba Soft Corp*., 336 F.3d 811 (9th Cir. 2003); *Perfect 10, Inc. v. Amazon*, 508 F.2d 1146 (9th Cir. 2007).

even though this copying is motivated by commercial interests. As the Supreme Court has noted, some of the most classic examples of fair use – like news reporting, comment, criticism, teaching, and scholarship – "are generally conducted for profit."[12] This is usually of less significance, however, because these works ordinarily use copyrighted material for transformative purposes, which weighs in favor of fair use.[13] The same reasoning applies to copying that is necessary for AI functionality: Using copyrighted works to create AI databases and training sets – though motivated by commercial interests – is a highly transformative use of those works. Moreover, copying the entirety of the works is often necessary to ensure AI functionality. The copyrighted material in the form of a dataset is also often used for its factual or informational contents; the material is generally not used for its creative content, which is what copyright seeks to protect in the first place. Finally, copying the works for the transformative purpose of AI functionality does not serve as a substitute for the original works or otherwise harm the copyright owners' markets for those works.

Notably, neither *Google* nor any of these other cases cited here considered copying that was used to create expressive output. Rather, these cases merely involved copying that was used to create a non-expressive research tool.[14] As a result, courts have yet to consider cases where the output is creative and expressive, though the fair use inquiry is likely flexible enough to adequately address this issue.

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[12] *Campbell v. Acuff-Rose Music, Inc.*, 510 U.S. 569, 584 (1994).

[13] *Id.* at 579 (1994) ("The more transformative the new work, the less will be the significance of other factors, like commercialism, that may weigh against a finding of fair use.").

[14] See generally M. Sag, *The New Legal Landscape for Text Mining and Machine Learning*, Journal of the Copyright Society of the USA, Vol 66 (2019) (arguing that *Google* and related cases make abundantly clear that text and data mining and other non-expressive uses of copyrighted material are fair use).

The USPTO's request also asks whether authors should receive attribution when their works are used in AI processes. There is no apparent reason why this would be necessary, especially when copying works for non-expressive AI processes is essential to AI functionality and would be permitted as a fair use for the reasons noted above. In addition, the Copyright Act does not recognize a right of attribution outside of 17 U.S.C. § 106A, and that right is specifically limited to works of "visual art." Moreover, the challenge of providing attribution for potentially thousands of works (or more) would be unfeasible.

4. Are current laws for assigning liability for copyright infringement adequate to address a situation in which an AI process creates a work that infringes a copyrighted work?

The application of the current laws may have areas where they adequately assign liability and other areas where they may not. Existing precedents concerning volition would likely be adequate in some scenarios. For example, assume an AI application allows a user of the program to imbue an image of the user's choice with the style of a well-known Renaissance artist. Assume further that the user of the program decides to use a copyrighted image, and has the AI system process that image to generate the output. Assuming the AI-generated output infringes the copyright in the image chosen by the user of the system, the owner of the AI application would not be liable for that infringement. The owner of the AI application has not engaged in volitional conduct to use the copyrighted image. Rather, the user of the application, and only the user, was responsible for using the image.[15]

[15] See, e.g., *EMI Christian Music Grp., Inc. v. MP3tunes, LLC*, 844 F.3d 79, 96 (2d Cir. 2016) (finding volitional copying where the defendant's system was designed to automatically retrieve album artwork whenever a song was uploaded by a user, and that retrieval was not done "at the direction of the user"); *Cartoon Network LP, LLLP v. CSC Holdings, Inc*., 536 F.3d 121, 131-32 (2d Cir. 2008) ("*Cartoon Network*) (finding no volitional copying by a cable company where its remote-DVR was used to copy content selected entirely by a user).

New cases must be monitored to ensure existing precedent proves adequate for some scenarios that could unfold with AI applications. For example, some commentators suspect that AI-generated works may soon be created autonomously with little human input, and that the content of these works may be relatively unforeseeable from the perspective of AI developers. If an AI system set in motion by its owner creates an infringing work, should the owner of the system be responsible for that infringement, even if the infringement was unintended and unforeseeable? Some would argue that as a matter of law the answer would seem to be "yes," since copyright infringement is a strict liability tort. However, reasonable minds might differ on whether imposing liability in this scenario is proper.[16]

One could also imagine relatively complicated scenarios with multiple parties. For example, assume an AI system is developed by Company A, trained by Company B, and used in a product sold by Company C. If the AI operates in a way that infringes another's copyright, one might think the product's owner (Company C) would be strictly liable for the infringement under current law. However, it is possible copyright owners may argue Companies A and B are secondarily liable because they had reason to foresee the infringement, and otherwise met secondary liability requirements. Courts will have to analyze these complex scenarios using existing precedents concerning secondary liability and volition.

5. **Should an entity or entities other than a natural person, or company to which a natural person assigns a copyrighted work, be able to own the copyright on the AI work? For example: Should a company who trains the artificial intelligence process that creates the work be able to be an owner?**

The answer to this question would depend on the definition of the term "entity." If the term "entity" refers to an entity with corporate personhood, then just like other types of

[16] See *Religious Technology Center v. Netcom On-Line Communications Services,* 907 F. Supp. 1361 N.D. Cal. 1995), as interpreted in *Cartoon Network*: "*Netcom* and its progeny direct our attention to the volitional conduct that causes the copy to be made." 536 F.3d at 131.

copyrightable material, the entity should be able to own a copyright on the "AI work" through assignment or by operation of law from a natural person. If, however, the term "entity" refers to an entity without corporate personhood (e.g., a computer), then the entity should not be able to own a copyright in the AI work.

To the extent that this question asks whether an entity or entities with corporate personhood can become an *author* of a copyrighted work, then as noted above for Question 2, this would have to be determined on the facts of each particular case. There may be certain cases in which sufficient creativity in a work is attributable to the efforts of a company that trained the AI process. In other cases, it may not be appropriate to find that the company that trained the AI has contributed sufficient creativity to the work that warrants authorship status. In practice, however, one would hope that this issue would be resolved beforehand, by contract, between the company developing the AI and the company training the AI to do its work.

6. **Are there other copyright issues that need to be addressed to promote the goals of copyright law in connection with the use of AI?**

There is no established consensus on the goals of copyright law in connection with the use of AI. Accordingly, it is premature to comment on issues for promoting such goals—embedded in the question is another question that is yet to be answered.

7. **Would the use of AI in trademark searching impact the registrability of trademarks? If so, how?**

Likely yes. Registrability of a trademark depends in part on its availability—if a trademark is already registered or is in use, that trademark cannot be registered. Accordingly, if the AI could find related trademarks that could not have been found without it (as some suggest),[17] it may become harder to register a mark. To be clear, the AI would not itself change

[17] See, e.g., World Trademark Review, *How AI Will Revolutionize Trademark Searches* (July 2, 2019), https://www.worldtrademarkreview.com/ip-offices/how-ai-will-revolutionise-trademark-searches.

the legal standard for registrability. However, the AI may change the way the legal standard is applied to analyze the availability of a particular mark. That said, figuring out what is "confusing similarity" is very nuanced and existing AI may not be good enough yet to correctly assess this factor.

8. How, if at all, does AI impact trademark law? Is the existing statutory language in the Lanham Act adequate to address the use of AI in the marketplace?

Traditionally speaking, when consumers compare marks in the marketplace, the focus has always been on overall similarities taking into consideration their phonetic, visual, and connotative similarities. However, with the rise of AI assistants (e.g., Amazon's Alexa) and ultimately voice ordering in the marketplace, the emphasis may shift to the phonetic similarities between the marks. This shift does not necessarily require any change in the existing statutory language. However, this could affect the fact finders' balancing scale when assessing likelihood of confusion.

9. How, if at all, does AI impact the need to protect databases and data sets? Are existing laws adequate to protect such data?

AI databases and data sets are extremely valuable to those in the industry. However, databases and datasets are generally afforded very limited protection under copyright law. Databases are protected the same as compilations, and copyright protection is "thin," extending only to the selection, coordination, and arrangement of the data.[18] For there to be infringement of a copyright in a database under current law, the infringer must essentially copy almost all of the contents of the database.[19] As a result, those who wish to protect AI databases and datasets may need to resort to other forms of protection, like trade secrets law or contractual arrangements.

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[18] See *Feist Publications, Inc. v. Rural Tel. Serv. Co*., 499 U.S. 340, 349 (1991).

[19] See *Experian Information Solutions, Inc. v. Nationwide Marketing Services, Inc*., 893 F.3d 1176 (9th Cir. 2018) (no infringement where defendant copied 80% of a database containing 250 million records).

10. **How, if at all, does AI impact trade secret law? Is the Defend Trade Secrets Act (DTSA), 18 U.S.C. 1836 et seq., adequate to address the use of AI in the marketplace?**

Trade secret law is very important for AI technologies, particularly for protecting certain aspects of AI that are difficult to protect using patents, such as training datasets and computational architectures of AI systems. Trade secret law may also be important to protect the implementations of AI technologies (e.g., binaries or machine-readable object code for AI systems) that have been obfuscated to thwart decompilation or reverse engineering. There are no reasons to believe that DTSA is inadequate for these purposes.

There is, however, a non-negligible risk that, in the future, AI itself would weaken the protection of trade secret law because AI may be used to reverse engineer, or make public, what would have been traditionally protected by trade secret law. For example, if an AI system decodes a complex, obfuscated software binary that had traditionally been impossible to decode, then the binary would no longer be protected by trade secret law. Accordingly, the AI may impact trade secret law.

11. **Do any laws, policies, or practices need to change in order to ensure an appropriate balance between maintaining trade secrets on the one hand and obtaining patents, copyrights, or other forms of intellectual property protection related to AI on the other?**

Intel is not aware of any laws, policies, or practices that warrant change at this time in order to ensure an appropriate balance between trade secret protection and other forms of IP protection.

12. **Are there any other AI-related issues pertinent to intellectual property rights (other than those related to patent rights) that the USPTO should examine?**

Intel is not aware of any laws, policies, or practices that warrant change at this time in order to ensure an appropriate balance between trade secret protection and other forms of IP protection.

13. **Are there any relevant policies or practices from intellectual property agencies or legal systems in other countries that may help inform USPTO's policies and practices regarding intellectual property rights (other than those related to patent rights)?**

Not that Intel would like to address at this time. There may be circumstances in the future where a legal system in another country provide a suitable framework to protect AI innovation which could be considered for adoption in the Unites States.