



October 30, 2023

Ms. Suzanne V. Wilson
General Counsel and Associate Register of Copyrights
U.S. Copyright Office, Library of Congress
101 Independence Avenue, SE
Washington, DC 20540

Dear Ms. Wilson:

Intel Corporation (“Intel”) appreciates the opportunity to provide comments to the United States (“U.S.”) Copyright Office in response to its request for comments to inform the Office’s study of the copyright law and policy issues raised by artificial intelligence (“AI”) systems, and to help assess whether legislative or regulatory steps in this area are warranted, including those involved in the use of copyrighted works to train AI models, the appropriate levels of transparency and disclosure with respect to the use of copyrighted works, and the legal status of AI-generated outputs.

Intel plays an important role in AI. Intel’s products, both hardware and software, help to solve today’s most complex challenges. For example, in healthcare and life sciences, we accelerate research and patient outcomes with faster, more accurate analysis across precision medicine, medical imaging, lab automation, and more. For manufacturing, we transform data into insights that help our customers optimize plant performance, minimize downtime, improve safety, and drive profitability. Intel is committed to advancing AI technology, including generative AI, responsibly and contributing to the development of principles, international standards, best practices methods, tools, and solutions to enable a more responsible, inclusive, and sustainable future.

We commend the U.S. Copyright Office for undertaking this effort. Intel offers the following comments in response to specific questions outlined in its request.

General Questions

1. As described [in the Notice], generative AI systems have the ability to produce material that would be copyrightable if it were created by a human author. What are your views on the potential benefits and risks of this technology? How is the use of this technology currently affecting or likely to affect creators, copyright owners, technology developers, researchers, and the public?

Generative AI describes the algorithms used to create content that can resemble human-generated content, including audio, code, images, text, simulations, and videos. This technology is trained with existing content and data, creating the potential for development of applications like natural language processing, computer vision, technology development, quality control, and speech synthesis. Generative AI is a powerful technology that analyzes arrangements and patterns in large data sets and uses this information to create new outputs. It has diverse applications across a wide range of sectors and industries. Its capabilities can yield greater operational efficiencies by automating specific tasks and allowing enterprises and individuals to focus time and resources on more important objectives. For content creators,

generative AI tools can assist with idea creation, content planning, marketing, editing, and drafting academic papers, social media posts, and news articles. Generative AI can help technology developers, researchers, and academics across the world to address global challenges with AI innovations from climate science to drug discovery and many others.

Just as the use cases and potential benefits of generative AI technology are broad and diverse, so are its implications and potential risks. For example, generative AI has been used to develop deepfake images and videos resulting in the spread of disinformation and contributing to public distrust in the authenticity of certain online content. Several copyright owners have experienced the replication and distribution of their original works by generative AI models without their consent, impacting the creator industry economy. Generative AI requires thoughtful and meaningful guardrails to protect our society and economy. Intel supports a risk-based, multi-stakeholder approach to establishing such guardrails that leverages international standards (e.g., ISO/IEC) and frameworks such as the National Institute for Standards and Technology (“NIST”) AI Risk Management Framework (RMF), which allow organizations to adopt the most appropriate internal processes and policies that are suitable for the responsible development and deployment of their products and services.

2. Does the increasing use or distribution of AI-generated material raise any unique issues for your sector or industry as compared to other copyright stakeholders?

Generative AI is powered by very large models and datasets, oftentimes requiring significant human and financial resources to develop the technology. However, some technology developers, academic researchers, and others may not have access to the resources and tools necessary to take advantage of the many economic, societal, and other benefits that generative AI can offer. This raises issues of accessibility and equity for technology stakeholders in the AI value chain. One way to address these challenges is by creating frameworks for the responsible development and deployment of AI that promotes broad access to cutting-edge models and additional data sources to facilitate a level playing field where innovation can thrive.

3. Please identify any papers or studies that you believe are relevant to this Notice. These may address, for example, the economic effects of generative AI on the creative industries or how different licensing regimes do or could operate to remunerate copyright owners and/or creators for the use of their works in training AI models. The Office requests that commenters provide a hyperlink to the identified papers.

Scholarly articles and papers that may be relevant to this Notice include writings by Pamela Samuelson¹, the Harvard Business Review², Christopher T. Zirpoli³, and Congressional testimony by Matthew Sag⁴.

¹ Samuelson, Pamela. “General AI meets copyright.” *Science*, 13 July 2023, <https://www.science.org/doi/full/10.1126/science.adi0656>.

² Appel, Gil, et al. “Generative AI Has an Intellectual Property Problem.” *Harvard Business Review*, 7 Apr. 2023, <https://hbr.org/2023/04/generative-ai-has-an-intellectual-property-problem>.

³ Zirpoli, Christopher T., “Generative Artificial Intelligence and Copyright Law” (2023). Copyright, Fair Use, Scholarly Communication, etc. 243.

<https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1245&context=scholcom>.

⁴ Artificial Intelligence and Intellectual Property – Part II:

Copyright and Artificial Intelligence: Hearing before the U.S. Senate Committee on the Judiciary

[“My Art My Choice”](#) (MAMC) is an effort to help protect provenance and authentic online content as it relates to copyright and generative AI. MAMC is a generative AI model that is trained in adversarial protection to disrupt stable diffusion, an open-source AI system based on a neural network architecture that uses deep learning to create and edit realistic images and text. MAMC learns how to break diffusion models by adding minor deviations to the input image without perceptually changing the original image. When stable diffusion encounters MAMC, it is prevented from replicating an original image; instead, its output is distorted, and the original image is protected. My Art My Choice is an approach that may inform the preservation of ownership information for AI-generated content in a seamless and human-centric manner.

4. Are there any statutory or regulatory approaches that have been adopted or are under consideration in other countries that relate to copyright and AI that should be considered or avoided in the United States? How important a factor is international consistency in this area across borders?

There are various approaches that relate to AI and copyright globally. For instance, unlike in the United States, the United Kingdom (UK) separates authorship and creativity in copyright law. As such, in the UK, computer generated works can receive copyright protection.⁵ With U.S. courts hearing cases on the issue of whether AI generated works should receive copyright protection, we believe that the judicial system is sufficient to handle this specific matter related to AI; U.S. Copyright Office and regulatory action is not necessary at this time. However, policymakers should monitor developments in the case law on this and other issues related to copyright and AI as the technology grows and its use increases.

Regarding training data and AI, Israel, Japan, and the European Union provide exemptions for text data mining that allow for using copyrighted works in certain circumstances as training data for machine learning.⁶ In the United States, the question of whether the fair use doctrine should provide an exception for training data and AI remains unclear. This is an approach that the U.S. Copyright Office can consider for further evaluation as it undertakes future action related to this assessment. Additionally, Intel encourages the U.S. Copyright Office to drive international consistency related to copyright and AI. AI is changing the way we live and work and its global impact in almost every sector of society will only continue to grow. Governments can work together to develop a trustworthy ecosystem that includes common frameworks that promote interoperability and responsibly manage the potential risks of AI technology.

5. Is new legislation warranted to address copyright or related issues with generative AI? If so, what should it entail? Specific proposals and legislative text are not necessary, but the Office welcomes any proposals or text for review.

Subcommittee on Intellectual Property, 118 Cong. (2023) (Statement of Prof. Matthew Sag). https://www.judiciary.senate.gov/imo/media/doc/2023-07-12_pm_-_testimony_-_sag.pdf.

⁵ <https://www.legislation.gov.uk/ukpga/1988/48/section/178>.

⁶ See, <https://www.project-disco.org/intellectual-property/011823-israel-ministry-of-justice-issues-opinion-supporting-the-use-of-copyrighted-works-for-machine-learning/>; <https://m-cacm.acm.org/news/273479-japan-goes-all-in-copyright-doesnt-apply-to-ai-training/fulltext?mobile=true>; <https://valohai.com/blog/copyright-laws-and-machine-learning/>.

The growth and acceleration of generative AI has raised new policy questions. With respect to copyright and generative AI, as noted above, several of these questions are being addressed through federal court litigation. While legal precedent is being developed in this nascent area, these judicial opinions can serve as guidance to policymakers as they assess whether legislative action is warranted. As such, it would be premature to introduce major shifts in U.S. copyright law; new legislation is not needed at this time.

Generative AI Outputs

Copyrightability

18. Under copyright law, are there circumstances when a human using a generative AI system should be considered the “author” of material produced by the system? If so, what factors are relevant to that determination? For example, is selecting what material an AI model is trained on and/or providing an iterative series of text commands or prompts sufficient to claim authorship of the resulting output?

United States copyright law protects only “the fruits of intellectual labor” that “are founded in the creative powers of the mind.”⁷ Human contribution (e.g., prompts) to a generative AI model are needed for the model to create content. An AI algorithm or process can 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.”⁸ Other scholars have made similar observations.⁹ In August 2023, a district court upheld a finding from the U.S. Copyright Office that a piece of art created by AI is not open to protection.¹⁰ The ruling stated that U.S. copyright law, “protects only works of human creation” and is “designed to adapt with the times.” There’s been a consistent understanding that human creativity is “at the core of copyrightability, even as that human creativity is channelled through new tools or into new media.”¹¹

As generative AI technology continues to develop, the question may become more difficult if the AI algorithm or process produces truly unexpected or unforeseen creative works, unrelated to user prompts or the data used to train AI models. 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. An analysis should consider whether sufficient creativity comes from user input, program design, training, or some other contribution. Considering this factor would seem more appropriate than assigning dispositive weight to one type of activity, without regard to its creative contribution. Whatever rubric is used to assign authorship, if any, to a machine generated work, there must be certainty for actors in the ecosystem -

⁷ 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).

⁸ Ginsburg & L. Budiardjo, Authors and Machines, 34 Berkley Tech. L. J., 343, 413 (initial proof dated October 21, 2019) (“Ginsburg”), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3233885.

⁹ 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).

¹⁰ *Thaler v. Perlmutter*, F.Supp. 3d 2023 WL 5333236, at *4 (D.D.C. Aug. 18, 2023).

¹¹ *Id.* at *10.

particularly where there is a chance of some joint authorship arising between actors at completely different levels in the process.

19. Are any revisions to the Copyright Act necessary to clarify the human authorship requirement or to provide additional standards to determine when content including AI-generated material is subject to copyright protection?

In U.S. copyright law, it is sufficiently established that human authorship is required to receive copyright protection. Federal courts have also declined to extend copyright protection to non-human authors.¹² No revisions to the Copyright Act are needed to clarify this requirement. For instances whereby humans create content using AI-generated material, case law and copyright registration guidance have outlined that the nature of human involvement in the creation of the work will be a factor to determine copyright protection.¹³ This is a case-by-case exercise. Current copyright registration guidance notes that a work containing AI-generated material can contain sufficient human authorship to support a copyright claim.¹⁴ For example, a human may select or arrange AI-generated material in a sufficiently creative way that “the resulting work as a whole constitutes an original work of authorship.”¹⁵ While this guidance currently holds, as the litigation landscape for generative AI evolves, it may be necessary for additional standards to clarify authorship for AI-generated material.

20. Is legal protection for AI-generated material desirable as a policy matter? Is legal protection for AI-generated material necessary to encourage development of generative AI technologies and systems? Does existing copyright protection for computer code that operates a generative AI system provide sufficient incentives?

Public policy is best served by applying current U.S. copyright law, in conjunction with contract law and anti-competition law, which we believe offers enough flexibility to incentivize the development of generative AI technologies and systems. There is no need to create new laws to protect AI-generated material at this time, since existing intellectual property law is capable of assigning rights to appropriate actors when it makes sense to do so.

20.1. If you believe protection is desirable, should it be a form of copyright or a separate sui generis right? If the latter, in what respects should protection for AI-generated material differ from copyright?

As explained above, we do not believe that the creation of a new protection right would be necessary or desirable.

Labeling or Identification

28. Should the law require AI-generated material to be labeled or otherwise publicly identified as being generated by AI? If so, in what context should the requirement apply and how should it work?

¹² See *Naruto v. Slater*, 888 F.3d 418, 426 (9th Cir. 2018).

¹³ Copyright Registration Guidance: Works Containing Material Generated by Artificial Intelligence, 88 Fed. Reg. 16190 (March 16, 2023).

¹⁴ *Id.* at 16192.

¹⁵ *Id.*

28.1. Who should be responsible for identifying a work as AI-generated?

The law should not require labeling for AI-generated material. However, as a best practice, transparency and trust are two important principles for organizations developing and deploying AI technologies. To help engender trust in AI systems, the public and end users should know that the technology is reliable, that bias mitigation is monitored and addressed, and that it includes tools to assess the authenticity of its outputs. AI developers should be primarily responsible and implement measures to facilitate these principles and assist in identifying a work as AI-generated. AI developers can build safeguards within the technology to help prevent it from being used to generate disinformation, including detection tools that can provide automatic AI-generated content detection and marking. AI developers can also provide an AI deployer with watermarking tools and other techniques to help make it clear to users that audio and visual content is AI-generated. It will be important to provide benchmarks and vetting processes to assess the quality of these tools. In addition, a certified repository of such tools would be useful to reduce the barrier for access.

29. What tools exist or are in development to identify AI-generated material, including by standard-setting bodies? How accurate are these tools? What are their limitations?

To address content authenticity, we propose considering two complimentary approaches. The first is improving AI-generated content detection algorithms. As generative AI continues to improve, we are in a constant race to utilize AI to combat AI. Many of these detectors rely on detecting issues with the AI-generated content, like artifacts in the generated video for example. However, for human videos an important factor to consider is detecting human authenticity signals, like heart rate, gaze, and voice patterns which are more predictable and generalize better. Intel has built detectors based on these signals and our analysis indicate that this approach shows better results in terms of accuracy and generalizability. As we increase modalities and fuse them, we end up with better accuracy and coverage. The second approach is embedding provenance information into authentic and generated content, so they can be traced back to the original creators or source models. This is a more direct way to embed and test for authenticity, but we can't assume that all content will follow this approach, hence the need for both approaches.

In addition to technological solutions, multistakeholder approaches including technical standards and media education can also help to address this type of risk. Intel is a member of The Coalition for Content Provenance and Authenticity (C2PA)¹⁶, a multistakeholder effort which is focused on addressing misleading information online through the development of technical standards for certifying the source and history (or provenance) of media content. Also, a specification, informed by work conducted through industry organizations including the Project Origin Alliance¹⁷ and the Content Authenticity Initiative¹⁸, has been published to enable global adoption of digital provenance techniques by creating secure provenance-enabled applications. It allows an image, video, or audio file to reliably tell us where it came from, when it was created and how. The specification allows for embedding cryptographically signed provenance information into media files. An arm of C2PA has developed and released

¹⁶ The Coalition for Content Provenance and Authenticity (C2PA) is a Joint Development Foundation project, formed through an alliance between Adobe, Arm, Intel, Microsoft and Truepic. See: <https://c2pa.org/>.

¹⁷ <https://www.originproject.info/>.

¹⁸ <https://contentauthenticity.org/>.

open-source tools to allow the public to develop applications making use of this emerging standard. Policymakers can encourage content creators, platforms, and companies to join standardization efforts such as C2PA, to adopt specifications and develop additional open technical standards.

Intel appreciates this opportunity and welcomes further discussion of our feedback to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'Angel Preston', with a long horizontal flourish extending to the right.

Angel Preston
Policy Director, Artificial Intelligence and IOT