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**THE COPYRIGHT AUTHORSHIP CONUNDRUM FOR
WORKS GENERATED BY ARTIFICIAL INTELLIGENCE:
A PROPOSAL FOR STANDARDIZED INTERNATIONAL
GUIDELINES IN THE WIPO COPYRIGHT TREATY**

*Kavya Rallabhandi**

ABSTRACT

The increasing sophistication of artificial intelligence (AI) technology in recent decades has led legal scholars to question the implications of artificial intelligence in the realm of copyright law. Specifically, who is the copyright “author” of a work created with the assistance of artificial intelligence—the AI machine, the human programmer, or no one at all? (Since the finalization of this Note, chatGPT, an AI text-generator with remarkable responsiveness and thoroughness, has taken by the world by storm, making resolution of the problems identified by this Note all the more urgent.) This Note recommends that the World Intellectual Property Organization (WIPO) resolve the confusion and inconsistency between various nation-specific approaches by adopting international guidelines that standardize how member-countries determine copyright authorship in AI-generated works. Since AI relies on human choices to create output, even if the final work seems autonomous or random to the average observer, this Note proposes that the human or corporate creators of AI machines are the copyright authors of AI-generated works. Therefore, the WIPO Copyright Treaty should adopt guidelines modeled after China’s approach, which attributes copyright authorship to the human or corporate entity responsible for making decisions that influence the originality and creative expression in AI-generated works.

I. INTRODUCTION

In 2016, a Dutch museum revealed a new Rembrandt painting to the world.¹ It was not a long-lost work of the revered artist who died 350 years ago, nor was it a restoration of one of Rembrandt’s famous portraits.² Rather, the two-year project headed by ING and

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1. See Andres Guadamuz, *Artificial Intelligence and Copyright*, WIPO MAGAZINE (Oct. 2017), https://www.wipo.int/wipo_magazine/en/2017/05/article_0003.html [<https://perma.cc/69AY-864Y>]. Throughout this Note, Artificial Intelligence will be shortened to “AI” and Intellectual Property will be shortened to “IP.”

2. See *id.*

Microsoft, entitled “The Next Rembrandt,” was configured by artificial intelligence and designed to generate portraits mirroring Rembrandt’s artistic style.³ Human programmers developed the AI with machine learning algorithms that scanned Rembrandt’s paintings for patterns in the subject’s eye shape or the artist’s brushstrokes; and limited the final AI output to a right-facing portrait of a 30 to 40 year old Caucasian male wearing black clothes, a white collar, and a hat.⁴ Though human-made programming variations altered specific aspects of the final portrait, like how the subject’s hair was distributed, “The Next Rembrandt’s” total look and feel was dictated by the AI—not the human programmers.⁵ The final AI-generated portrait consists of 148 million pixels and 168,263 fragments from Rembrandt’s 346 known works.⁶

Reviving a dead artist through new paintings is merely the tip of the iceberg for today’s AI technology. Google’s Digital News Initiative partnered with start-ups and national news agencies in the United Kingdom and Ireland to create AI that writes “detailed story templates” and “compelling local stories” on a large variety of topics for hundreds of media outlets.⁷ The MuseNet online tool uses AI to generate songs with up to 10 different musical instruments, in over 15 different styles, like jazz or pop, and can even imitate the styles of famous artists like Mozart.⁸ The user simply has to feed the AI a tune, select how they want the tune to be altered, and the AI comes up with creations like the “Harry Potter theme [song] in the style of a video game soundtrack.”⁹ The growth of machine-learning AI technology in our daily life and on a global scale raises the question: do AI-generated works merit cop-

3. See *id.*; Chris Baraniuk, *Computer Paints ‘New Rembrandt’ After Old Works Analysis*, BBC NEWS (Apr. 6, 2016), <https://www.bbc.com/news/technology-35977315> [<https://perma.cc/S29V-9CFS>].

4. See Baraniuk, *supra* note 3.

5. See *id.*

6. See Guadamuz, *supra* note 1.

7. See Julia Gregory, *Press Association Wins Google Grant to Run News Service Written by Computers*, THE GUARDIAN (July 6, 2017), <https://www.theguardian.com/technology/2017/jul/06/press-association-wins-google-grant-to-run-news-service-written-by-computers> [<https://perma.cc/M2PN-ZYYA>].

8. See Jon Porter, *OpenAI’s MuseNet Generates AI Music at the Push of a Button*, THE VERGE (Apr. 26, 2019), <https://www.theverge.com/2019/4/26/18517803/openai-musenet-artificial-intelligence-ai-music-generation-lady-gaga-harry-potter-mozart> [<https://perma.cc/WB7G-XXSB>;view-mode=Client-side&type=image].

9. See *id.*

right protection, and if so, should AI machines retain copyright ownership in the creative works they help create?¹⁰

Globally, there has been little consensus on how to extend, and even whether to extend copyright protection for AI-generated works.¹¹ The World Intellectual Property Organization (WIPO) created the Berne Convention for the Protection of Literary and Artistic Works (Berne Convention), which establishes minimum standards of international copyright protection through principles of national treatment, automatic protection, and independence of protection.¹² Member-countries of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) and the WIPO Copyright Treaty (WCT) are also bound by the Berne Convention's minimum standards.¹³ Berne Convention minimum standards require member-countries to automatically extend the copyright protections that authors receive in their nations to any qualifying works created by authors in other member-countries, without additional registration requirements.¹⁴ Qualifying "literary and artistic works" under the Berne Convention, like paintings, must be fixed in a material form, such as canvas, and have original expression.¹⁵

10. See Annemarie Bridy, *Coding Creativity: Copyright and the Artificially Intelligent Author*, 2012 STAN. TECH. L. REV. 1, 5 (2012); *Artificial Intelligence and Intellectual Property Policy*, WORLD INTELL. PROP. ORG., https://www.wipo.int/about-ip/en/artificial_intelligence/policy.html [https://perma.cc/M2TN-5HWX].

11. See *Artificial Intelligence and Intellectual Property Policy*, *supra* note 10; see generally *The WIPO Conversation on Intellectual Property and Artificial Intelligence*, WORLD INTELL. PROP. ORG., https://www.wipo.int/about-ip/en/artificial_intelligence/conversation.html [https://perma.cc/YB5K-UM9N] (explaining that the WIPO Conversation on IP and AI was developed to discuss the impact of AI on IP and aid the WIPO in developing considerations on IP policy concerning AI).

12. See *Summary of the Berne Convention for the Protection of Literary and Artistic Works (1886)*, WORLD INTELL. PROP. ORG., https://www.wipo.int/treaties/en/ip/berne/summary_berne.html [https://perma.cc/9Q54-JU9Z] [hereinafter *Summary of the Berne Convention*]; Berne Convention for the Protection of Literary and Artistic Works, July 24, 1971, 828 U.N.T.S. 221, as amended S. Treaty Doc. No. 99-27 (1979), <https://wipolex.wipo.int/en/text/283693> (last visited Sept. 5, 2022) [hereinafter Berne Convention].

13. See *Summary of the Berne Convention*, *supra* note 12, n.1; *Summary of the WIPO Copyright Treaty (WCT) (1996)*, WORLD INTELL. PROP. ORG., https://www.wipo.int/treaties/en/ip/wct/summary_wct.html [https://perma.cc/BZ39-A46U]; *WIPO Copyright Treaty (WCT)*, WORLD INTELL. PROP. ORG., <https://www.wipo.int/treaties/en/ip/wct/> [https://perma.cc/952Z-4JP5] <https://perma.cc/952Z-4JP5>; *TRIPS: A More Detailed Overview of the TRIPS Agreement (1995)*, WORLD TRADE ORG., https://www.wto.org/english/tratop_e/trips_e/intel2_e.htm [https://perma.cc/J5FQ-YUHL].

14. See Berne Convention, *supra* note 12, art. 5; *Summary of the Berne Convention*, *supra* note 12.

15. See Berne Convention, *supra* note 12, art. 2.

There is no international standard outlining copyright protections for AI-generated works, and each Berne Convention member-country can enforce additional national copyright protections while maintaining “minimum standard” compliance.¹⁶ Therefore, an AI programmer who is seeking copyright in a final AI-generated work is faced with a confusing, country-specific patchwork of copyright protections.¹⁷ Since the core purpose of copyright (or author’s right) is to incentivize human creativity and innovation by providing exclusivity over the economic and moral rights attached to a copyrightable work,¹⁸ WIPO has traditionally defined an “author” as a human because non-human AI machines neither respond to the economic incentives of copyright ownership/authorship, nor have the conscientious creativity and expressive personality required for a qualifying work.¹⁹ WIPO launched the

16. In recognizing the importance of establishing an international standard, WIPO states that “as artificial intelligence (AI) continues to emerge as a general-purpose technology with widespread applications throughout the economy and society, this poses fundamental questions that sit at the heart of the existing IP systems. Does AI innovation and creation need IP incentives? How should the value of human invention and creation be balanced against AI innovation and creation? Does the advent of AI require any changes to the existing IP frameworks?” *Artificial Intelligence and Intellectual Property Policy*, *supra* note 10. Under the Berne Convention, “works originating in one of the Contracting States (that is, works the author of which is a national of such a State or works first published in such a State) must be given the same protection in each of the other Contracting States as the latter grants to the works of its *own* nationals”—meaning the latter State need not provide all the same protections authors receive in their nation of origin, as long as minimum standards are met. Protection for AI-generated works is a contested issue on a national level that is at the center of current WIPO discussions. *Summary of the Berne Convention*, *supra* note 12 (emphasis added); *see also* Guadamuz, *supra* note 1.

17. *Artificial Intelligence and Intellectual Property Policy*, *supra* note 10; *see Summary of the Berne Convention*, *supra* note 12; *see also* Guadamuz, *supra* note 1.

18. Economic rights “allow the rights owner to derive financial reward from the use of their works by others,” and moral rights “protect the non-economic interests of the author.” *Copyright*, WORLD INTELL. PROP. ORG., <https://www.wipo.int/copyright/en/> [<https://perma.cc/U8L2-ETWX>]. Generally, economic rights empower an author to restrict/grant use of their works and make money through prohibiting or authorizing the work’s “reproduction in various forms, such as printed publication or sound recording; public performance, such as in a play or musical work; recording, for example, in the form of compact discs or DVDs; broadcasting, by radio, cable or satellite; translation into other languages; and adaptation, such as a novel into a film screenplay.” *See id.* Moral rights are recognized to varying extents by member-countries, but widely recognized moral rights “include the right to claim authorship of a work and the right to oppose changes to a work that could harm the creator’s reputation.” *Id.*

19. The Summary of the WIPO Conversation on IP and AI states “many consider that an intellectual work is an original form created by a physical person . . . who was aware of the result to be achieved, which rules out AI.” The WIPO Conversation Summary also addresses varying nation-specific approaches and emphasizes the need for consensus. World Intell. Prop. Org. [WIPO], *WIPO Conversation on Intellectual Property (IP) and Artificial Intelligence (AI): Summary of Conversation*, ¶¶ 76–77 WIPO Doc. WIPO/IP/AI/GE/19/INF 4 (Oct. 31, 2019), https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_ai_ge_19/

“WIPO Conversation on Intellectual Property and Artificial Intelligence” for member-countries and other stakeholders to discuss and resolve fundamental issues in intellectual property (IP) and AI, like copyright authorship attribution.²⁰

The lack of standardized international guidelines for attribution of copyright authorship in AI-generated works has extensive implications for copyright law because AI is commonly used to generate “literary and artistic works” like music, articles, and artwork.²¹ Works without authors can be deemed free of copyright and placed in the public domain to be used freely by anyone.²² This will have a severe commercial impact on the companies and human programmers that invest millions of dollars and countless hours of labor into developing the AI systems.²³ In addition to significant loss of revenue, the incentive for individuals and corporations to continue investing resources into the development of AI technology is negatively impacted because human or corporate authors cannot exercise exclusive economic and moral rights tied to the final AI-generated outputs.²⁴ Since copyright law, at its core, works to promote and incentivize human creativity and innovation, this Note argues that AI-generated works require copyright protection.²⁵ Another legal issue arises in deciding whether to attribute the copyright to the human author, to the non-human AI author, or to no one at all.²⁶

The WIPO Copyright Treaty (WCT) should be amended to establish baseline international guidelines, modeled on China’s copyright legal framework, that attribute copyright authorship to the human or corporate entity responsible for making decisions that influence the AI-generated work’s original and creative expression. Part II of this Note will define copyright, discuss the development of artificial intelligence technology, and describe the

wipo_ip_ai_ge_19_inf_4.pdf [https://perma.cc/25ZB-HS3M] [hereinafter *Summary of Conversation*].

20. See *The WIPO Conversation on Intellectual Property and Artificial Intelligence*, *supra* note 11; *Artificial Intelligence and Intellectual Property Policy*, *supra* note 10.

21. See, e.g., Guadamuz, *supra* note 1; Gregory, *supra* note 7; Porter, *supra* note 8.

22. See Guadamuz, *supra* note 1; *Summary of Conversation*, *supra* note 19, ¶¶ 83–85.

23. See Guadamuz, *supra* note 1.

24. See *id.*; *Summary of the Berne Convention*, *supra* note 12.

25. See *Copyright*, *supra* note 18.

26. See Bridy, *supra* note 10, at 5; *Artificial Intelligence and Intellectual Property Policy*, *supra* note 10. Humans and AI could also be listed as co-authors. Annemarie Bridy, *The Evolution of Authorship: Work Made by Code*, 39 COLUM. J.L. & ARTS 395, 396–97 (2016). Co-authorship relies on the premise that AI can obtain authorship status, so this Note will not address co-authorship as an additional avenue.

purpose and framework of various international copyright treaties and organizations. Part II will also explain the three common national approaches to resolving the AI authorship conundrum by using the United States, the United Kingdom, and China as exemplars. The United States has not extended copyright protection for AI-generated works because its copyright law requires human creativity; the United Kingdom awards authorship to humans and/or AI that only arranged for the created work; and China attributes copyright authorship to the human or corporate entity responsible for making decisions that influence the AI-generated work's original and creative expression.²⁷ Part III proposes amending the WCT to establish baseline international guidelines that adopt China's copyright authorship approach for AI-generated works. Part IV concludes the Note.

II. BACKGROUND

The World Intellectual Property Organization (WIPO) defines the legal term "copyright" (or author's right) as the exclusive economic and moral "rights that creators have over their literary and artistic works."²⁸ Copyright-related international treaties include the WIPO Berne Convention for Protection of Literary and Artistic Works (Berne Convention), the World Trade Organization (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), and the WIPO Copyright Treaty (WCT).²⁹ WIPO launched the Conversation on Intellectual Property and Artificial Intelligence for member-countries and stakeholders to discuss the impact of AI on IP, come to a consensus on fundamental issues like

27. See Yanru Chen, *Chinese Court Backs Copyrights for AI-Created Works*, CHINA JUST. OBSERVER, (Oct. 30, 2020), <https://www.chinajusticeobserver.com/a/chinese-court-backs-copyrights-for-ai-created-works> [<https://perma.cc/JL2W-YCWG>]; *Summary of Conversation*, *supra* note 19, ¶ 74 ("The majority of countries, including continental Europe, Australia, and the United States require human creativity in their copyright law. Others, such as the United Kingdom, Ireland, South Africa, New Zealand, and India, adopted the wording of the UK Copyright Designs and Patents Act (CDPA), and award authorship to the person who arranged for the created work. It was originally based on the concept of 'skill and labor' or 'sweat of the brow.'").

28. *Copyright*, *supra* note 18.

29. See *id.*; Berne Convention, *supra* note 12; see generally WIPO Copyright Treaty, Dec. 20, 1996, S. Treaty Doc. No. 105-17, 2186 U.N.T.S. 121, <https://wipolex.wipo.int/en/text/295157> [hereinafter WCT] (providing the authentic text of the treaty); Agreement on Trade Related Aspects of Intellectual Property Rights, Apr. 15, 1994, 33 I.L.M. 81, https://www.wto.org/english/docs_e/legal_e/27-trips_01_e.htm [hereinafter TRIPS Agreement].

copyright authorship in AI-generated works, and eventually amend international treaties with standardized guidelines.³⁰

A. *Defining Copyright and Artificial Intelligence*

Copyright, as defined by WIPO, protects the exclusive economic and moral rights that authors have over their literary and artistic works.³¹ Literary and artistic works include novels, poems, plays, articles, computer programs, films, musical compositions, and maps.³² Literary and artistic works require fixation and originality.³³ Fixation means the work must be produced in a tangible medium like canvas, paper, or video.³⁴ Originality means the author’s creative expression must be novel—meaning the author cannot use copyrighted elements from another’s work—and requires authors to express a requisite level of unique skills and judgment in their works.³⁵ The requisite level of skill is a very low threshold because the purpose of copyright is to spur innovation and creativity.³⁶ Skill is defined as the “use of knowledge, developed aptitude or practiced ability to produce the work,” and judgment is defined as “using discernment or ability to form an opinion or evaluation by comparing different possible options in producing the work.”³⁷

Economic rights ensure that authors are properly compensated when others use their works by means of reproduction, public performance, broadcasting, recording, translating, or adaptation.³⁸ Moral rights provide authors with non-economic incentives, like the right to oppose reputation-harming alterations to their works.³⁹

30. See *Artificial Intelligence and Intellectual Property Policy*, *supra* note 10; *The WIPO Conversation on Intellectual Property and Artificial Intelligence*, *supra* note 11.

31. See *Copyright*, *supra* note 18.

32. See *id.* The listed literary and artistic works are commonly protected by copyright. See *id.* An exhaustive list of all works covered by copyright cannot usually be found in legislation, either on a national or international level. See *id.* Since copyright protects an author’s creative expression in an original and fixed work, copyright protection does not extend to ideas, methods of operations, facts, or copied artistic expressions from other copyrighted works. See *id.*

33. See *id.*; U.S. COPYRIGHT OFFICE, CHAPTER 300 – COPYRIGHTABLE AUTHORSHIP: WHAT CAN BE REGISTERED, ¶¶ 305, 308. <https://www.copyright.gov/comp3/chap300/ch300-copyrightable-authorship.pdf> [<https://perma.cc/6P7V-DCRZ>].

34. See *Copyright*, *supra* note 18; U.S. COPYRIGHT OFFICE, *supra* note 33, ¶ 305.

35. See James Wagner, *Rise of the Artificial Intelligence Author*, 75 THE ADVOCATE (VANCOUVER) 527, 528 (2017).

36. See *id.*

37. *Id.*

38. See *Copyright*, *supra* note 18.

39. See *id.*

The exclusive economic and moral rights afforded to human authors of copyrighted works are further outlined and defined in the Berne Convention, TRIPS Agreement, and WIPO Copyright Treaty.⁴⁰ Parties other than the author of a copyrighted work must obtain a license or the author's express permission to utilize the exclusive rights afforded by copyright.⁴¹

WIPO has traditionally defined a copyright "author" as a human because non-human AI machines neither respond to the economic and moral incentives of copyright ownership/authorship, nor have the conscientious creativity and expressive personality required for originality in a literary or artistic work.⁴² Before the rapid development of AI, copyrighted works could be clearly and directly attributed to the human author's original creative decisions. For example, an artist chooses the watercolors and brushes to creatively paint a novel landscape, or a photographer selects the lighting, lens, and angle of a camera to shoot a novel photo.⁴³ The tools used in those examples—the watercolor, the brushes, the camera—are seemingly distinct from current artificial intelligence technology because they are perceived to be directly controlled by the human author in creating a copyrighted work.⁴⁴

In contrast, rapid developments in AI technology have made it hard to directly connect the programmer's actions to the final AI-generated work.⁴⁵ AI requires human-authored computer pro-

40. See Berne Convention, *supra* note 12; see generally WCT, *supra* note 29 (listing the rights of distribution, rental, and communication to the public for the author); see TRIPS Agreement, *supra* note 29.

41. See Copyright, *supra* note 18; Summary of the Berne Convention, *supra* note 12; Berne Convention, *supra* note 12, arts. 11, 13.

42. See Summary of Conversation, *supra* note 19, ¶¶ 76–77 (“[M]any consider that an intellectual work is an original form created by a physical person . . . who was aware of the result to be achieved, which rules out AI.”); Summary of the Berne Convention, *supra* note 12.

43. See Guadamuz, *supra* note 1; Who Would Own Copyright in a Poem Written by AI?, YOURSINTELLECTUALLY, <https://yoursintellectually.wordpress.com/2016/12/29/who-would-own-copyright-in-a-poem-written-by-ai/> [https://perma.cc/MX3P-LKYL]; Wagner, *supra* note 35, at 529.

44. See Guadamuz, *supra* note 1; Who Would Own Copyright in a Poem Written by AI?, *supra* note 43; Wagner, *supra* note 35, at 529. AI used to be so dependent on human input that many regarded it as a human tool as well, but the technology still raised early discussions of copyright issues involving AI-generated works. See Ralph D. Clifford, *Intellectual Property in the Era of the Creative Computer Program: Will the True Creator Please Stand Up?*, 71 TUL. L. REV. 1675, 1693 (1996); Arthur R. Miller, *Copyright Protection for Computer Programs, Databases, and Computer-Generated Works: Is Anything New Since CONTU?*, 106 HARV. L. REV. 977, 1042-72 (1993); see generally Pamela Samuelson, *Allocating Ownership Rights in Computer-Generated Works*, 47 U. PITT. L. REV. 1185, 1192–96 (1986) (discussing Congress's efforts, beginning in the 1970s, to investigate authorship of computer-generated works).

45. See Guadamuz, *supra* note 1.

programming to function and generate final outputs.⁴⁶ Modern AI programs function through machine learning algorithms, meaning that the AI can draw inferences from patterns in data, learn, and adapt without explicit or direct instructions from human programmers.⁴⁷ Therefore, as AI technology becomes more advanced and it is harder to directly attribute creative aspects of an AI-generated work back to the human author's copyrighted computer code, AI will be perceived as less of a human tool (like a paintbrush) and more of an independent author in the final copyrighted work.⁴⁸

"The Next Rembrandt" is a prime example—human programmers coded the AI's machine-learning algorithms to scan data on Rembrandt's paintings, fed the AI 346 of Rembrandt's known works, and limited the AI-generated output to a right-facing middle-aged Caucasian man wearing black clothes, a white collar, and a hat.⁴⁹ Programmers determined that altering the algorithms would change artistic elements in the final AI-output.⁵⁰ However, the human programmers could not predict *exactly* what the AI would generate.⁵¹ The final overall look and feel of "The Next Rembrandt" was unique and seemingly unpredictable, even though human programmers directly contributed to the work and the AI heavily relied on those human programming cues to generate a final, original copyrightable work.⁵² AI has not yet reached the level of sentient sophistication to engage in purely independent creative decisions that amount to copyright authorship under national law and international guidelines.⁵³

Artificial intelligence is a discipline of computer science aimed at developing machines and systems that can complete tasks requiring human intelligence.⁵⁴ AI technology began in the 1980s with

46. See *Frequently Asked Questions: AI and IP Policy*, WORLD INTELL. PROP. ORG., https://www.wipo.int/about-ip/en/artificial_intelligence/faq.html (last visited Apr. 1, 2021); *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 44; Wagner, *supra* note 35, at 529.

47. See *What Is Artificial Intelligence (AI)*, IGI GLOBAL, <https://www.igi-global.com/dictionary/artificial-intelligence-ai/1512> [<https://perma.cc/K4DV-BX7L>].

48. See *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 43; Wagner, *supra* note 35, at 530.

49. See Guadamuz, *supra* note 1; Baraniuk, *supra* note 3.

50. Baraniuk, *supra* note 3.

51. See *id.*; Guadamuz, *supra* note 1.

52. See Guadamuz, *supra* note 1; Baraniuk, *supra* note 3.

53. See *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 43; Wagner, *supra* note 35, at 531.

54. See *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; *What Is Artificial Intelligence (AI)*, *supra* note 47.

the proliferation of computers.⁵⁵ There is no concrete, universal definition for artificial intelligence.⁵⁶ At a basic level, an artificial intelligence computer program applies a rule or formula that was created by humans to compute a final output.⁵⁷ The complexity of the AI computation may change depending on the technology; however, the human-created rule or formula that was created by humans is currently always necessary to inform the AI in its task.⁵⁸ For example, a calculator relies on a human to input a formula to output the correct mathematical response.⁵⁹ On a more complex level, AI can produce an outcome like an intricate password that appears to be random to the user and may not be predicted by the programmer, but can be attributed back to the code itself.⁶⁰ The various levels of AI sophistication and capability, based on decreasing order of human dependence, are below.⁶¹ Level D has not yet been achieved because it requires AI sentience:⁶²

- Level A – Lowest degree of sophistication; can only perform operations that they have been programmed for with no operational variation.
- Level B – Respond to users' questions by retrieving data from external sources such as websites or applications resident on other devices.
- Level C – Can make autonomous decisions such as deciding what data to retrieve from which source and the manner of presenting it in response to a query.
- Level D – Most sophisticated; can work without human interference. Capable of reprogramming itself and using data in

55. See Samuelson, *supra* note 44, at 1196 (“there is no question but that many machine-generated works are already available, and that in the future they can be expected to become ever more complex, sophisticated and valuable”).

56. See *Frequently Asked Questions: AI and IP Policy*, *supra* note 46.

57. See *id.*; *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 43; Wagner, *supra* note 35, at 528–29.

58. See *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 43; Wagner, *supra* note 35, at 529.

59. See *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 43; Wagner, *supra* note 35, at 529.

60. See *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 43; Wagner, *supra* note 35, at 529.

61. See *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 43.

62. See *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 43; Bridy, *supra* note 10, at 2 n.5 (noting that current AI technology is narrow, not sentient, and utilized for generating copyrightable works . . . [so] “the time is upon us to consider their relationship to copyrights and the legal construction of authorship on which copyrights depend . . . it is a virtual certainty that [sentient] AI is coming . . . the only serious question is timing: will we have general human-level AI in eighty, forty, twenty, or ten years?”).

any manner it wants, making its functioning identical to human behavior.⁶³

Scholarship discussing the possibility of AI-authored works is extensive, and while some argue that AI output is a derivation of the AI's independent originality or creativity, the general consensus among the legal and engineering communities is that our society is far from achieving "Level D"—autonomous AI technology that makes independent decisions without human input.⁶⁴ Moreover, if AI were to make autonomous choices without human programming, it is likely that "copyright will be the least of our concerns."⁶⁵

B. *International Copyright Organizations and Treaties*

Copyright law protects the exclusive rights that authors have in original literary and artistic works like computer programs, paintings, or articles.⁶⁶ There is no "international copyright."⁶⁷ Rather, copyright protection is obtained automatically at the time of fixation and individual nations provide voluntary registration mechanisms for recordation purposes.⁶⁸ WIPO also has a PROOF system to complement voluntary national copyright registration.⁶⁹ In an increasingly globalized market, international treaties have been created to standardize principles of copyright law and ensure reciprocity for recognition of copyright between countries.⁷⁰

63. *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 43.

64. See James Grimmelman, *There's No Such Thing as a Computer-Authored Work—And It's a Good Thing, Too*, 39 COLUM. J.L. & ARTS 403, 403 (2016); Miller, *supra* note 44, at 1055–71; Clifford, *supra* note 44, at 1684–86; Andrew J. Wu, *From Video Games to Artificial Intelligence: Assigning Copyright Ownership to Works Generated by Increasingly Sophisticated Computer Programs*, 25 AIPLA Q.J. 131, 155–57 (1997); Evan H. Farr, *Copyrightability of Computer-Created Works*, 15 RUTGERS COMPUT. & TECH. L.J. 63, 79–80 (1989); Bridy, *supra* note 10, at 2 n.5; but see Daniel J. Gervais, *The Machine as Author*, 105 IOWA L. REV. 2053, 2053 (2020) (arguing that AI has developed deep learning and "arguments in favor of protection are flawed and unconvincing and that a proper analysis of the history, purpose, and major doctrines of copyright law all lead to the conclusion that productions that do not result from human creative choices belong to the public domain").

65. See Grimmelman, *supra* note 64, at 403.

66. See *Copyright*, *supra* note 18.

67. See *id.*

68. See *id.*

69. The WIPO PROOF service was launched in 2020 and terminated on January 31, 2022. Existing WIPO PROOF account holders can continue to access their dashboard to verify date and time stamped files, and all verifications are indefinitely valid. See *WIPO PROOF (Discontinued)*, WORLD INTELL. PROP. ORG., <https://www.wipo.int/wipoproof/en/> [<https://perma.cc/S6XT-T3V2>]; see *id.*

70. See *id.*; *Summary of the Berne Convention*, *supra* note 12.

1. The Berne Convention for Protection of Literary and Artistic Works

The Berne Convention, first adopted as an international treaty in 1886, has 179 signatory countries out of 195 countries in the world today.⁷¹ It protects intellectual property in works that encompass “every production in the literary, scientific, and artistic domain, whatever the mode or form of its expression,”⁷² and protects the rights of authors such as programmers, writers, artists, musicians, photographers, and designers.⁷³ The three basic principles of the Berne Convention are: (1) reciprocity, or the principle of “national treatment”;⁷⁴ (2) the principle of “automatic protection”; and (3) the principle of “independence” of protection.⁷⁵ The reciprocal national treatment principle requires works originating in one of the member states to be “given the same protection” in every other member state as the latter affords to works created by their own nationals.⁷⁶ The automatic protection principle requires that protection in any member state cannot be conditional upon compliance with any country-specific formality.⁷⁷ Lastly, the principle of independence of protection requires that the reciprocal and automatic copyright protection of a creative work is treated independently from the copyright protection in creative work’s country of origin.⁷⁸

71. See *Summary of the Berne Convention*, *supra* note 12; Berne Convention, *supra* note 12, art. 2(3).

72. See *Summary of the Berne Convention*, *supra* note 12; Berne Convention, *supra* note 12, art. 2(3).

73. See *Berne Convention*, COPYRIGHT HOUSE, <https://copyrighthouse.org/countries-berne-convention/> [<https://perma.cc/YRF6-AG9W>]; *Summary of the Berne Convention*, *supra* note 12.

74. See generally *Summary of the Berne Convention*, *supra* note 12, n.1 (describing under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement), the “most favored nation treatment” standard binds members of the World Trade Organization (WTO) to reciprocity, even if they are not members of the Berne Convention. This national treatment principle obligates WTO member countries to reciprocate the advantages provided to their nationals to nationals from every other WTO member-country. A member-country’s delayed application of the TRIPS Agreement does not affect the automatic application of the national treatment and most-favored obligations).

75. See *Summary of the Berne Convention*, *supra* note 12; Berne Convention, *supra* note 12, art. 5.

76. See *Summary of the Berne Convention*, *supra* note 12; Berne Convention, *supra* note 12, art. 5.

77. See *Summary of the Berne Convention*, *supra* note 12; Berne Convention, *supra* note 12, art. 5.

78. See *Summary of the Berne Convention*, *supra* note 12; Berne Convention, *supra* note 12, art. 5.

The three Berne Convention principles are enforced simultaneously with minimum standards of protection related to duration and exclusivity.⁷⁹ Duration of protection under the Berne Convention dictates that protection must be granted, at a minimum, until the expiration of the fiftieth year after the author's death.⁸⁰ Applied art and photographic works receive minimum protection for 25 years from the creation of the work.⁸¹ Member countries are free to extend these durations of protection, and under the Berne Convention principles, every member-country must respect the others' term protection limits.⁸² Exclusive copyright authorization rights that must be recognized by all member countries include: (1) the right to translate; (2) the right to make adaptations and arrangements of the work; (3) the right to perform in public; (4) the right to recite works in public; (5) the right to communicate to the public the performance of protected works; (6) the right to broadcast; (7) the right to make reproductions in any manner or form; and (8) the right to use the work as a basis for an audiovisual work.⁸³

2. The Agreement on Trade-Related Aspects of Intellectual Property Rights

The World Trade Organization (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) was established on January 1, 1995.⁸⁴ The TRIPS Agreement was the first comprehensive treaty passed in order to facilitate the resolution of trade disputes over intellectual property, and TRIPS promotes creativity and innovation across borders using international trade policy.⁸⁵ As intellectual property became a stronger factor for companies and countries to consider when engaging in trade,

79. See *Summary of the Berne Convention*, *supra* note 12; Berne Convention, *supra* note 12, art. 6^{bis}, 7, 7^{bis}.

80. See *Summary of the Berne Convention*, *supra* note 12; Berne Convention, *supra* note 12, art. 6^{bis}, 7, 7^{bis}.

81. See *Summary of the Berne Convention*, *supra* note 12; Berne Convention, *supra* note 12, art. 6^{bis}, 7, 7^{bis}.

82. In addition, "under the TRIPS Agreement, any term of protection that is calculated on a basis other than the life of a natural person must be at least 50 years from the first authorized publication of the work, or – failing such an event – 50 years from the making of the work." *Summary of the Berne Convention*, *supra* note 12.

83. See *Summary of the Berne Convention*, *supra* note 12; Berne Convention, *supra* note 12, art. 3, 8, 10^{bis}, 11, 11^{ter}, 11^{bis}, 12, 14.

84. See *TRIPS: A More Detailed Overview of the TRIPS Agreement (1995)*, *supra* note 13.

85. See *id.*; World Trade Org., *Intellectual Property: Protection and Enforcement*, WORLD TRADE ORG., https://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm7_e.htm [https://perma.cc/7RRZ-WPDV].

nation-specific differences in trade policy became a source of tension within international economic relations.⁸⁶ The TRIPS Agreement aimed to provide predictability and uniformity in settling such disputes by establishing common international rules which require minimum standards of protection and enforcement for all WTO member countries.⁸⁷ Though WTO member countries have the freedom to tailor details of their trade policies in order to balance “the long term benefits of incentivizing innovation” with “the possible short term costs of limiting access to creations of the mind,” these nations are bound by minimum protection standards that also align with the Berne Convention principles.⁸⁸

The TRIPS Agreement provisions regarding copyright include all of the same standards of international copyright protection established in the Berne Convention.⁸⁹ In furtherance of strong copyright protection between nations, the TRIPS Agreement added provisions to clarify and emphasize three main points:

- (1) computer programs must be protected as literary works under the Berne Convention;
- (2) authors of computer programs and sound recordings must be afforded the exclusive right to prohibit the commercial rental of their protected works to the public; and
- (3) performers have a 50-year term limit to enforce their exclusive right to prevent unauthorized recording, reproduction, and bootlegging of their work.⁹⁰

3. The World Intellectual Property Organization

The World Intellectual Property Organization (WIPO) was established by the United Nations in 1967 to serve as a global forum for intellectual property (IP) services, information, policy, and international cooperation.⁹¹ WIPO has 193 member states and has worked since its inception to “lead the development of a balanced and effective international IP system that enables innovation and creativity for the benefit of all.”⁹² WIPO provides the biggest multi-stakeholder forum for international conversations on how existing

86. See World Trade Org., *supra* note 85.

87. See *id.*

88. See *id.*; *Summary of the Berne Convention*, *supra* note 12.

89. World Trade Org., *supra* note 85; see also *Summary of the Berne Convention*, *supra* note 12 (establishing its basic principles as national treatment and automatic and independent protection).

90. See *TRIPS: A More Detailed Overview of the TRIPS Agreement (1995)*, *supra* note 13; World Trade Org., *supra* note 85; TRIPS Agreement, *supra* note 29, arts. 10.1, 11, 12.

91. See *Inside WIPO*, WORLD INTELL. PROP. ORG., <https://www.wipo.int/about-wipo/en/> [<https://perma.cc/PZ2U-RYFB>].

92. See *Inside WIPO*, *supra* note 91.

intellectual property laws and systems should adapt as AI continues to develop into a commonplace technology.⁹³ The WIPO Copyright Treaty and the WIPO Conversation on IP and AI are important international tools to examine because the former establishes international copyright principles and the latter has brought together all member-countries and stakeholders of the Berne Convention, WIPO, and TRIPS to discuss the impact of AI on IP.⁹⁴

a. The WIPO Copyright Treaty

The 1966 WIPO Copyright Treaty (WCT) is an agreement under the Berne Convention that addresses intellectual property protection of works in the digital age.⁹⁵ All members and contracting parties of TRIPS and the Berne Convention are also bound to the WCT, and must comply with WCT provisions.⁹⁶ The WCT outlines two main digital subject areas that must be given copyright and must be protected by Berne Convention principles and minimum standards.⁹⁷ The first WCT subject area requiring copyright protection is computer programs in every mode or form of expression.⁹⁸ The second WCT subject area requiring copyright protection is compilations of data or any other form of material databases where the selection or arrangement of data constitutes an “intellectual creation[].”⁹⁹

In addition to the two digital content subject matter protections that the WCT enforces, the WCT also provides additional rights to authors.¹⁰⁰ The Berne Convention acts as the baseline for rights and protection granted to authors, which is why the WCT and

93. See *Artificial Intelligence and Intellectual Property Policy*, *supra* note 10.

94. See *Artificial Intelligence and Intellectual Property Policy*, *supra* note 10; *Summary of Conversation*, *supra* note 19, ¶¶ 68–89; *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 14; see generally WCT, *supra* note 29, art. 1 (describing the WCT’s relation to the Berne Convention).

95. *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; see *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; see generally WCT, *supra* note 29 (describing the WCT’s relation to the Berne Convention).

96. *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; see generally WCT, *supra* note 29, art. 1 (describing the WCT’s relation to the Berne Convention).

97. See *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; see generally WCT, *supra* note 29, arts. 4, 5 (listing computer programs and databases as the digital forms covered by the treaty).

98. *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; WCT, *supra* note 29, art. 4.

99. *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; WCT, *supra* note 29, art. 5.

100. See *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; see generally WCT, *supra* note 29, arts. 6, 7, 8 (listing the rights of distribution, rental, and public communication).

TRIPS Agreement build off of the Berne Convention copyright protections, rather than proposing entirely new international standards.¹⁰¹ Therefore, apart from the rights granted to authors under the Berne Convention, the WCT also grants authors of copyrighted digital works: (i) the right to distribution, which is “the right to authorize the making available to the public of the original and copies of a work through sale or other transfer of ownership”; (ii) the right of rental, which is “the right to authorize commercial rental to the public of the original and copies of three kinds of works”; and (iii) the right to communicating the work to the public, which is “the right to authorize any communication to the public, by wire or wireless means, including . . . on demand, interactive communication through the internet.”¹⁰²

Authors with copyright protection for their creative works can generate revenue in all member-countries by using any of the exclusive rights in the Berne Convention, TRIPS Agreement, or WCT.¹⁰³ Any third-party must gain permission from the author to use the copyrighted work, or must pay a licensing fee to utilize exclusive rights of the work.¹⁰⁴

b. The WIPO Conversation on Intellectual Property and Artificial Intelligence

In 2019, the WIPO Conversation on Intellectual Property and Artificial Intelligence was established to provide a platform for member states and stakeholders to discuss the impact of AI on the exclusive rights of IP holders.¹⁰⁵ The WIPO Conversation was created with the intention of serving as an open and inclusive process for all interested parties to bridge the information gap between the

101. See *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; *Summary of the Berne Convention*, *supra* note 12; *TRIPS: A More Detailed Overview of the TRIPS Agreement (1995)*, *supra* note 13; see generally WCT, *supra* note 29, art. 1 (noting that the treaty is a “special agreement” within the meaning of the Berne Convention); Berne Convention, *supra* note 12; TRIPS Agreement, *supra* note 29, art. 9.

102. *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; WCT, *supra* note 29, arts. 6, 7, 8.

103. See *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; *Summary of the Berne Convention*, *supra* note 12; *TRIPS: A More Detailed Overview of the TRIPS Agreement (1995)*, *supra* note 13.

104. See *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; *Summary of the Berne Convention*, *supra* note 12; *TRIPS: A More Detailed Overview of the TRIPS Agreement (1995)*, *supra* note 13.

105. See *The WIPO Conversation on Intellectual Property and Artificial Intelligence*, *supra* note 11; *WIPO’s Conversation on IP and AI to Continue as a Virtual Meeting*, WORLD INTELL. PROP. ORG., https://www.wipo.int/pressroom/en/articles/2020/article_0013.html [<https://perma.cc/GP2U-8SQZ>].

rapid development in AI technology with the often slow-moving judicial and legislative developments in national and international IP law.¹⁰⁶

In September 2019, WIPO held the First Session of the WIPO Conversation on IP and AI in order to understand the universal complications arising in the IP field with regard to AI, to draft the most pressing questions that policymakers need to consider, and to open a worldwide consultation process.¹⁰⁷ In response to over 250 submissions, WIPO published the Revised Draft Issues Paper on IP Policy and AI in March 2020.¹⁰⁸ The Revised Draft Issues Paper section that is most relevant to the AI copyright authorship question is “*Issue 7: COPYRIGHT AND RELATED RIGHTS - Authorship and Ownership,*” which is quoted in relevant part below:¹⁰⁹

AI applications are increasingly capable of generating literary and artistic works. This capacity raises major policy questions for the copyright system, which has always been intimately associated with the human creative spirit and with respect and reward for, and the encouragement of, the expression of human creativity. The policy positions adopted in relation to the attribution of copyright to AI-generated works will go to the heart of the social purpose for which the copyright system exists. If AI-generated works were excluded from eligibility for copyright protection, the copyright system would be seen as an instrument for encouraging and favoring the dignity of human creativity over machine creativity. If copyright protection were accorded to AI-generated works, the copyright system would tend to be seen as an instrument favoring the availability for the consumer of the largest number of creative works and of placing an equal value on human and machine creativity. Specifically,

106. See *The WIPO Conversation on Intellectual Property and Artificial Intelligence*, *supra* note 11.

107. See *id.*

108. The First Session led to the publication of the WIPO Draft Issues Paper on IP policy and AI in December 2019 and triggered a worldwide public consultation process where over 250 submissions were received with feedback. After the 2020 Revised Draft Issues Paper were released, the Second Session of the WIPO Conversation on IP and AI was held on July 2020 and the Third Session of the WIPO Conversation on IP and AI was held on November 4, 2020. Despite many Second and Third Session discussions among 1,500 registered participants representing over 130 countries, there is still no international consensus about how to resolve the copyright authorship issue for AI-generated works. The date for the Fourth Session of the WIPO Conversation on IP and AI has not been announced yet. See *WIPO Conversation on Intellectual Property (IP) and Artificial Intelligence (AI) Second Session: Revised Issues Paper on Intellectual Property Policy and Artificial Intelligence*, WORLD INTELL. PROP. ORG. (May 21, 2020) https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_ai_2_ge_20/wipo_ip_ai_2_ge_20_1_rev.pdf [https://perma.cc/9THE-YR8A] [hereinafter *Second Session Revised Issues Paper*]; *The WIPO Conversation on Intellectual Property and Artificial Intelligence*, *supra* note 11.

109. See *Second Session Revised Issues Paper*, *supra* note 108.

- (i) Do AI-generated works require copyright or a similar incentive system at all?
- (ii) Should copyright be attributed to original AI-generated literary and artistic works or should a human creator be required?
- (iii) If copyright can be attributed to AI-generated works, can the AI-generated works be considered original?¹¹⁰

C. *Country-Specific Approaches Regarding the Artificial Intelligence and Copyright Protection Dilemma with Respect to Authorship*

Nations disagree about extending copyright to AI-generated works because it is unclear how the human author/programmer can retain authorship over the final product if he or she could not predict the AI-generated outcome.¹¹¹ Nations that attribute human authors to AI-generated works choose to do so because the AI-generated output is still reliant on the copyrighted human-made computer code, even if the outcome *seems* independent or random to the average observer.¹¹² Due to varying and inconsistent national approaches, the creation of the WIPO Conversation on Intellectual Property and Artificial Intelligence signals to the 193 member-countries of WIPO, Berne Convention, WCT, and TRIPS that standardized guidelines on the AI copyright authorship issue are imperative and necessary.¹¹³

There are three broad national approaches addressing authorship of AI-generated works in copyright law.¹¹⁴ The first approach, followed by the United States, Australia, and most continental European countries, requires human creativity in copyright law and does not extend copyright protection to AI-generated works.¹¹⁵ The second approach, followed by New Zealand, United Kingdom, South Africa, and India, awards authorship through leg-

110. *See id.*

111. *See* Grimmelmann, *supra* note 64, at 403–04, 408; Bridy, *supra* note 10, at 3; *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 43; Wagner, *supra* note 35, at 529.

112. *See* Grimmelmann, *supra* note 64, at 404, 407–08; Bridy, *supra* note 10, at 3; *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 43; Wagner, *supra* note 35, at 530.

113. *See Second Session Revised Issues Paper*, *supra* note 108; *Inside WIPO*, *supra* note 91.

114. *See Summary of Conversation*, *supra* note 19, ¶ 74; *see WIPO CONVERSATION ON INTELLECTUAL PROPERTY (IP) AND ARTIFICIAL INTELLIGENCE (AI): Summary of Second and Third Sessions*, p.7, WORLD INTELL. PROP. ORG., (Jan. 8, 2021), https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_ai_3_ge_20/wipo_ip_ai_3_ge_20_inf_5.pdf [hereinafter *Summary of Second and Third Sessions*] (stating the various copyright authorship approaches and opinions that participants at the third session of the WIPO Conversation on IP and AI—cited here to show parallels between these opinions and various national approaches).

115. *See id.*

islation to the human that arranged the work and broadly permits fully autonomous or sentient AI to author works.¹¹⁶ The last approach, followed by China and Japan, uses the judicial system to incrementally expand upon existing legislation by attributing copyright authorship to human programmers and companies that create code dictating AI's creative decisions and by declining to extend authorship to AI.¹¹⁷ The United States, the United Kingdom, and China are exemplars for the primary approaches to the copyright authorship issue in AI-generated works.

1. United States Strategy for Copyright Protection in AI-Generated Works

The United States of America is a member of the Berne Convention, the TRIPS Agreement, and the WIPO Copyright Treaty.¹¹⁸ Authorship of copyrighted works has been a contested issue in the United States for almost 200 years—much longer than AI has been around.¹¹⁹ Under the current legal framework in the United States, human authors can retain copyright ownership in AI-generated works as long as they can prove that the AI was used solely as a tool of creativity, like a paintbrush or a camera.¹²⁰ Human authors can also retain copyright in the source code that dictates the decisions of AI programs.¹²¹ However, the U.S. Copyright Act does not extend protection to autonomously generating AI-generated works if the final output is not predictable by human authors.¹²² According to U.S. Copyright Office regulations, random or automatically

116. *See id.*

117. *See id.*; Zhou Bo, *Artificial Intelligence and Copyright Protection—Judicial Practice in Chinese Courts*, https://www.wipo.int/export/sites/www/about-ip/en/artificial_intelligence/conversation_ip_ai/pdf/ms_china_1_en.pdf [<https://perma.cc/KF8U-VQDA>].

118. *International Copyright Relations of the United States, Circular 381A*, U.S. COPYRIGHT OFF., <https://www.copyright.gov/circs/circ38a.pdf> [<https://perma.cc/C249-2LDA>] at 13.

119. *See* Kalin Hristov, *Artificial Intelligence and the Copyright Dilemma*, 57 IDEA 431, 431 (2017). The U.S. Constitution promotes innovation through intellectual property in stating that “Congress shall have [p]ower . . . [t]o promote the [p]rogress of [s]cience and useful [a]rts, by securing for limited [t]imes to [a]uthors and [i]nventors the exclusive [r]ight to their respective [w]ritings and [d]iscoveries.” U.S. CONST. art. I, § 8, cl. 8.

120. *See* Hristov, *supra* note 119, at 435.

121. *See* 17 U.S.C. § 102(a) (“Copyright protection subsists, in accordance with this title, in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.”).

122. The U.S. Copyright Office’s example of a random machine generated material is a “weaving process that randomly produces irregular shapes in the fabric without any discernible pattern.” *See* U.S. COPYRIGHT OFFICE, COMPENDIUM OF U.S. COPYRIGHT OFFICE PRACTICES § 313.2 (3d ed. 2021).

generated works created by AI “lack” the element of human creation, and non-human AI cannot author works.¹²³

Since the U.S. Copyright Office has been slow to acknowledge the human creativity and originality component of AI-generated works, these works are not attributed to any author and fall into the public domain, which means anybody can use them for free.¹²⁴ The U.S. Copyright Office Compendium states “[the office] will not register works produced by a machine or mere mechanical process that operates randomly or automatically without any creative input or intervention from a human author.”¹²⁵ The U.S. courts have deferred to the Copyright Office by upholding this leg-

123. See U.S. COPYRIGHT OFFICE, COMPENDIUM OF U.S. COPYRIGHT OFFICE PRACTICES, *supra* note 122, § 313.2; Russ Pearlman, *Recognizing Artificial Intelligence (AI) as Authors and Inventors Under U.S. Intellectual Property Law*, 24 RICH. J.L. & TECH. 2, 15 (2018).

124. The Compendium of Best Practices published by the U.S. Copyright Office states that creative works generated by AI are not copyrightable if they do not meet the human-made requirement in the Copyright Act. See U.S. COPYRIGHT OFFICE, COMPENDIUM OF U.S. COPYRIGHT OFFICE PRACTICES, *supra* note 122, § 313.2. Many legal scholars look to the U.K. Copyright Code as a template for amending the U.S. Copyright Act. See Copyright, Designs and Patents Act, 1988, c. 48, § 9(3) (U.K.) [hereinafter CDPA] (copyright is attributed to “the person by whom the arrangements necessary for the creation of the work are undertaken”); see Bridy, *supra* note 10; Hristov, *supra* note 119, at 444. U.K. law provides copyright authorship to “the person by whom the arrangements necessary for the creation of the work are undertaken,” which resembles the U.S. work made for hire doctrine, where non-human entities can obtain copyright authorship in works created by their human employees or contractors. See CDPA, *supra* note 125, § 9(3); Kim Boyle, *Copyright Authorship in the Artificial Intelligence Age*, DUNNER LAW (June 28, 2019), <http://dunnerlaw.com/copyright-authorship-in-the-artificial-intelligence-age/> [https://perma.cc/N4PX-U3GX]. The two types of works made for hire under U.S. copyright law include “a work prepared by an employee during the scope of his or her employment” or “a work specially ordered or commissioned for use . . . if the parties expressly agree in a written instrument signed by them that the work shall be considered a work made for hire.” 17 U.S.C. § 101 (2018). Scholars believe both types of work made for hire can be adapted to apply to AI-generated works because the author, a company, is not originally responsible for the work and also because a company itself is a non-human author. See 17 U.S.C. § 101. Critics of this work made for hire solution argue that amending the U.S. Copyright Act in this way is incorrect because the work made for hire doctrine is based on agency law between an employer and employee and cannot be properly appropriated into the AI copyright authorship context. See Bridy, *supra* note 10, at 25–27; Hristov, *supra* note 119, at 444; see generally Robert A. Jacobs, *Work-For-Hire and the Moral Right Dilemma in the European Community: A U.S. Perspective*, 16 B.C. INT’L & COMP. L. REV. 29 (1993) (noting that moral rights generally only accrue to the creator of a work and thus “work by means other than creation” may have complicated implications for those rights).

125. See U.S. COPYRIGHT OFF., COMPENDIUM OF U.S. COPYRIGHT OFFICE PRACTICES, *supra* note 122, § 313.2; but see Elvia Arcelia Quintana Adriano, *The Natural Person, Legal Entity or Juridical Person and Juridical Personality*, 4 PENN. ST. J.L. & INT’L AFFS. 363, 366 (2015) (suggesting that under some theories, “enterprises may conduct activities that require “juridical personality” that allow for the accrual of rights and obligations).

islative precedent, and have not significantly carved new law for copyright authorship in AI-generated works.¹²⁶

2. United Kingdom Strategy for Copyright Protection in AI-Generated Works

The United Kingdom (U.K.) is a member of the Berne Convention, the TRIPS Agreement, and the WIPO Copyright Treaty.¹²⁷ The U.K. Parliament passed the first legislation in the world that comprehensively addressed copyright in works created by artificial intelligence in 1988.¹²⁸ The U.K. legislature recognized the potential negative economic impact on human and corporate authors, many of whom invest millions of dollars to develop AI technologies, if copyright protection was not extended to AI-generated works.¹²⁹ In order to spur confidence in developmental investments for AI technology, the U.K. legislature included Section 9(3) into the Copyright, Designs, and Patents Act of 1988 (CDPA), which permitted AI machines to author the computer-generated works that it arranged.¹³⁰ The CDPA defines “author” as the creator of the work and the first owner of copyright in a work.¹³¹ The United Kingdom allows a copyright to subsist in AI-generated works by attributing authorship of the works to the human, corporate, or AI machine author that simply arranged the final copyrighted work.¹³²

Section 9(3) of the CDPA states that the author of a “computer-generated” literary, dramatic, musical, or artistic work “shall be taken to be the person by whom the arrangements necessary for

126. See Hristov, *supra* note 119, at 441. The U.S. case, *Naruto*, decided whether a non-human animal could retain copyright authorship, and the Court decided no. This non-human authorship principle now applies to non-human AI that generate works, seemingly “independent” of the human programmer. See *Naruto v. Slater*, 888 F.3d 418, 424–25 (9th Cir. 2018); *Photographer ‘Lost £10,000’ in Wikipedia Monkey ‘Selfie’ Row*, BBC NEWS, (Aug. 7, 2014), <http://www.bbc.com/news/uk-england-gloucestershire-28674167> [<https://perma.cc/K5C7-QSND>].

127. See Gov.UK, *Protecting Your UK Copyright Abroad: International Law*, INTELL. PROP. OFF., <https://www.gov.uk/government/publications/protecting-your-uk-intellectual-property-abroad/protecting-your-copyright-abroad> (last visited Apr. 1, 2021).

128. Tony Bond & Sarah Blair, *Artificial Intelligence & Copyright: Section 9(3) or Authorship Without an Author*, 14 J. INTELL. PROP. L. & PRAC. 423, 423 (2019), available at <https://academic.oup.com/jiplp/article/14/6/423/5481160>; see CDPA, *supra* note 124.

129. See Bond & Blair, *supra* note 128.

130. *Id.*; see CDPA, *supra* note 124, § 9(3).

131. See CDPA, *supra* note 124, §§ 9(1), 11.

132. Nina Fitzgerald et al., *An In-Depth Analysis of Copyright and the Challenges Presented by Artificial Intelligence*, ASHURST (Mar. 11, 2020), <https://www.ashurst.com/en/news-and-insights/insights/an-indepth-analysis-of-copyright-and-the-challenges-presented-by-artificial-intelligence/>.

the creation of the work are undertaken.”¹³³ Section 178 of the CDPA defines a computer-generated work as one that “is generated by a computer in circumstances such that there is no human author of the work.”¹³⁴ The language in Section 9(3) focuses heavily on the “skill of labor” or “sweat of the brow” required to arrange a work, rather than requisite levels of creativity and originality generally needed to merit copyright protection of a work.¹³⁵ The focus on labor in the U.K. CDPA language, rather than original creativity like in the United States, is intentional because it is simpler to prove that AI machines made the “arrangements necessary for the creation of the [computer-generated] work”¹³⁶ than to prove that the AI made independent creative decisions like a human would to create a copyrightable work.¹³⁷

While the United Kingdom’s strategy of copyright authorship attribution in AI-generated works to non-humans is novel, the practical application of CDPA Section 9(3) is unclear.¹³⁸ First, the CDPA does not create a clear distinction between AI-generated works with human authors where the AI is used as a tool (like a paintbrush) and computer-generated works without human authors where the AI machine has sole authorship over the final work.¹³⁹ Without a bright line distinguishing AI-generated works from computer-generated works, it is difficult to uniformly apply Section 9(3) to all works using artificial intelligence in their creation.¹⁴⁰ Second, while the CDPA permits AI machines to be authors in works that they create, U.K. courts have yet to address how the original creativity requirement for copyrighted works will apply in the context of human-dependent artificial intelligence technology.¹⁴¹ The United Kingdom’s approach resolves the copyright authorship question for AI-generated through a “legal fiction” of authorship, where copyright can vest as a matter of law

133. See *CDPA*, *supra* note 124, § 9(3); Fitzgerald et al., *supra* note 132.

134. See *CDPA*, *supra* note 124, § 178; Fitzgerald et al., *supra* note 132.

135. See *Summary of Conversation*, *supra* note 19, ¶¶ 74–75.

136. See *CDPA*, *supra* note 124, § 9(3).

137. See Bond & Blair., *supra* note 128; Bridy, *supra* note 10, at 26–27.

138. See Bond & Blair, *supra* note 128.

139. *Id.*

140. *Id.*

141. The reason for these impracticalities may be because Section 9(3) of the CDPA has not been amended or updated since 1988 and therefore rests on outdated perceptions of autonomous technology. See Bond & Blair, *supra* note 128.

into a party, such as a human-dependent AI machine, that is not actually the author-in-fact of the final work.¹⁴²

3. The Chinese Strategy for Copyright Protection in AI-Generated Works

China is a member of the Berne Convention, the TRIPS Agreement, and the WIPO Copyright Treaty.¹⁴³ The Copyright Law of the People's Republic of China (CL) is the nation's statutory framework for providing copyright protection to creative works.¹⁴⁴ The CL was approved by the People's Republic of China National Copyright of Administration (CNAC) and the Copyright Protection Centre of China (CPCC) in 1990, and amended in 2001, 2010, and 2020.¹⁴⁵ The CPCC registers the copyright in computer software and the CNAC handles nationwide copyright registration for all creative works.¹⁴⁶ Copyrighted works in China are subject to the principles of national treatment, automatic protection, and independence of protection,¹⁴⁷ as well as the minimum standards and exclusive rights outlined in the Berne Convention, TRIPS, and WCT.¹⁴⁸ Similar to the international copyright definition, the CL defines a copyrighted "work" as original works of literature, art, and science which can be fixed or reproduced in a tangible form.¹⁴⁹ The CL states that absent contrary evidence, the copy-

142. See Bridy, *supra* note 10, at 26–27; INTEL. PROP. OFF., *supra* note 127; Intellectual Property Office, *Ownership of Copyright Works*, GOV.UK, <https://www.gov.uk/guidance/ownership-of-copyright-works> (last visited Apr. 1, 2021); *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 43.

143. See *Members and Dates of Acceptance*, WORLD TRADE ORG., https://www.wto.org/english/tratop_e/trips_e/amendment_e.htm (last visited Apr. 1, 2021); *WIPO-Administered Treaties*, WORLD INTEL. PROP. ORG., https://wipolex.wipo.int/en/treaties/ShowResults?search_what=&country_id=38C (last visited Apr. 1, 2021).

144. See Frank Ka-Ho Wong, *Intellectual Property in China: Laws and Registration Procedures*, CHINA BRIEFING (Nov. 14, 2019), <https://www.china-briefing.com/news/intellectual-property-china-laws-registration-procedures/>; *International Comparative Legal Guides: Copyright 2021*, ICLG.COM, <https://iclg.com/practice-areas/copyright-laws-and-regulations/china>; Sofia Baruzzi, *China's Copyright Law Amended: Key Changes*, CHINA BRIEFING, (Jan. 4, 2021), <https://www.china-briefing.com/news/china-copyright-law-amended-key-changes/>.

145. See Wong, *supra* note 144; *International Comparative Legal Guides: Copyright 2021*, *supra* note 144; Baruzzi, *supra* note 144.

146. See Wong, *supra* note 144; *International Comparative Legal Guides: Copyright 2021*, *supra* note 144.

147. See Wong, *supra* note 144; *International Comparative Legal Guides: Copyright 2021*, *supra* note 144.

148. See Wong, *supra* note 144.

149. See *International Comparative Legal Guides: Copyright 2021*, *supra* note 144.

right owner is the author who is a citizen, legal person, or organization whose name is registered with the copyrighted work.¹⁵⁰

China's legislation, while in line with international standards, has yet to explicitly address the copyright authorship issue for AI-generated works.¹⁵¹ In 2020, the Chinese judicial system extended copyright protection to AI-generated works and attributed authorship in the final work to the human author or organization that created the AI.¹⁵² AI-generated works were not always protected by copyright—this shift in judicial precedent happened quickly. In 2019, the Beijing Internet Court in China ruled in *Beijing Film Law Firm v. Baidu Network Technology Co., Ltd.* that only works created by “natural persons” and possessing ingenuity or creativity in themselves could be deemed as a protected work under Chinese copyright law.¹⁵³ The Court in *Baidu Network* denied copyrightability in a legal report generated by AI, even though humans inputted search terms to create the report, because the Court held that authors of written works needed to be natural persons, not machines.¹⁵⁴

Just months after the 2019 *Baidu* ruling, a significant increase in the number of AI copyright authorship cases created a shift in judicial opinions.¹⁵⁵ In January 2020, a Chinese court held in *Shenzhen*

150. See *id.*; Baruzzi, *supra* note 144.

151. See Bo, *supra* note 117.

152. See *id.*

153. In *Baidu Network*, the plaintiff generated a report from Wolter Kluwer China Law & Reference and claimed that the defendant copied portions of the report. The defendant argued that Wolter Kluwer China Law & Reference is merely an AI software that autonomously created the report, and therefore plaintiff has no copyright claim to the report because AI cannot be an author. Though the plaintiff demonstrated how they set search conditions, applied search term filters and clicked “visualize” to create a report from the search terms, the Beijing Court ruled that the report was not protected by copyright. The Court held that though originality in the work exists because the plaintiff chose search terms and filtered content, the final report was not created by a natural person but rather the Wolter Kluwer AI technology. See Beijing Feilin Lu Su Baidu Wang Xun Keji Youxiang Qin Hai Baohu Zuopin Wanzheng Quan Xinxiwangluo Chuanbo Quan Jiufen An (北京菲林律师事务所诉北京百度网讯科技有限公司侵害署名权、保护作品完整权、信息网络传播权纠纷案) [*Beijing Film Law Firm v. Beijing Baidu Netcom Science & Technology Co., Ltd.*, case of dispute over the infringement of the right to sign, and protection of the integrity of works and the right to disseminate information], Beijing Internet Ct. Case No. 239, Apr. 25, 2019 (China) [hereinafter *Baidu*], <http://www.lawinfochina.com/display.aspx?lib=case&id=3836> [<https://perma.cc/7ENR-8AH4>]; Kan He, Feilin v. Baidu: *Beijing Internet Court Tackles Protection of AI/Software-Generated Work and Holds that Copyright Only Vests in Works by Human Authors*, THE IPKAT (Nov. 9, 2019), <https://ipkitten.blogspot.com/2019/11/feilin-v-baidu-beijing-internet-court.html> [<https://perma.cc/H3WL-4KP2?type=image>].

154. See *Baidu*, *supra* note 153; He, *supra* note 153.

155. See Bo, *supra* note 117.

Tencent v. Shanghai Yingxun that an AI-generated published news article merited copyright protection because the human AI creator's arrangement and creative selection of data input, article template, and stylistic writing choices could be directly attributed and connected with the original and creative expression in the news article.¹⁵⁶ Even though the words were "randomly generated" by the AI technology, the Court expanded their interpretation of human direct influence in the final output to conclude that the corporation was the copyright author of the AI-generated article.¹⁵⁷ The *Tencent* judgment is the first case in China to affirmatively confirm the protection of AI-generated works under copyright law and to attribute authorship to the human/corporate creators of the AI program.¹⁵⁸ In April 2020, a Chinese court held in *Gao Yang et al. v. Golden Vision* that high-altitude photographs taken automatically by AI merit copyright protection because though humans did not click the shutter-release button to take the photograph (the AI made this decision), humans were solely responsible for making creative decisions that influenced the high-altitude photographs such as the shooting angle, video recording mode, and video display format.¹⁵⁹

156. In *Tencent*, the plaintiff created an AI named Dreamwriter which assisted in writing about 300,000 articles per year. Defendant copied and reposted Tencent Corporation's finance article entitled Noon Review: Shanghai Index Slightly Rise by 0.11% and Closed at 2691.93 points, Leading Sectors including Telecommunication Operation, Oil Exploration, etc., which was written using Dreamwriter. The two issues the court tackled were (1) whether AI-generated works were protected under copyright law; and (2) whether Tencent, which facilitated the creation of the disputed article, is entitled to be the copyright author. With regard to the first issue, the court held that the AI-generated article is a literary work because the article's contents, specifically the structure, analysis, and judgment of the stock market, were reflected in the human programming code. With regard to the second issue, the court held that the AI-generated article was created using Tencent Corporation human programmers' brainpower, creativity, and hard work. See Chen, *supra* note 27 (citing Shenzhenshi Tengxun Jisuanjixitong Youxiang Shanghai Ying Xun Keji Youxiang (深圳市腾讯计算机系统有限公司 上海盈讯科技有限公司) [Shenzhen Tencent Computer System Co., Ltd. v. Shanghai Yingxun Technology Co., Ltd.], Nanshan Dist. People's Ct. Case No. 14010, Nov. 24, 2019 (China) [hereinafter *Tencent*]).

157. See Chen, *supra* note 27 (citing *Tencent*, *supra* note 156).

158. See *id.*; Youping Ma & Guoquan Yang, *China: Artificial Intelligence: Can AI-Created Works Be Copyrighted?*, MANAGINGIP (Mar. 27, 2020), <https://www.managingip.com/article/blkqljbrkclb41/china-artificial-intelligence-can-ai-created-works-be-copyrighted>.

159. See Yanru Chen, *Does China Back Copyrights for Automatic Photos from a Hot-Air Balloon?*, CHINA JUSTICE OBSERVER, (Nov. 22, 2020), <https://www.chinajusticeobserver.com/a/does-china-back-copyrights-for-automatic-photos-from-a-hot-air-balloon> (citing Youku Xinxijishu Beijing Youxiang Beijing Mo Keji Youxiang Shanghai Quan Tudou Wenhua Chuanbo Jinse Shi Zu Yingshi Wenhua Youxiang (优酷信息技术(北京)有限公司 北京陌陌科技有限公司 上海土豆文化传播有限公司 金色视族(北京)影视文化有限公司) [Gao Yang et al. v. Golden Vision, A Dispute over Owner-

According to China's legislative and judicial approach to copyright authorship, AI-generated works should not be excluded from copyright protection simply because the final works are seemingly random, or because AI machines are non-human and can make some decisions without explicit human instruction. Rather, copyright authorship in AI-generated works is attributed to the human or organization that can exhibit a direct contribution to, or influence on, the originality and creative expression of the final AI-generated work.¹⁶⁰

III. ANALYSIS

The WIPO Copyright Treaty should be amended to establish baseline international guidelines, modeled on China's copyright legal framework, that attribute copyright authorship to the human or corporate entity responsible for making decisions that influence the AI-generated work's original and creative expression.

A. *The WCT Should Adopt International Guidelines for AI-Generated Works Because Standardization Is Needed and the WCT Is the Proper Forum*

The WCT should adopt international guidelines for AI-generated works because WIPO member-countries are seeking standardization and the WCT is the proper forum. International guidelines standardizing how copyright authorship is applied to AI-generated works are essential because WIPO member-countries differ greatly in the way their copyright laws protect authors and interpret AI-generated works.¹⁶¹ The three most common approaches to authorship for AI-generated works are exemplified by the copyright frameworks of the United States, the United Kingdom, and China.¹⁶² The United States requires human creativity in copyright law and therefore lets AI-generated works fall into the public domain; the United Kingdom focuses on "sweat of the brow / skill of labor" and assigns authorship to the human programmer or AI that arranged the work; and China attributes copyright authorship to the human or corporate entity responsible for making decisions

ship of and Infringement on Copyrights], Beijing Internet Ct. Case No. 797, Apr. 2, 2020 (China) [hereinafter *Golden Vision*]).

160. See Chen, *supra* note 27 (citing *Tencent*, *supra* note 156); Chen, *supra* note 159 (citing *Golden Vision*, *supra* note 159).

161. See *Summary of Conversation*, *supra* note 19, ¶ 68.

162. See *id.* ¶ 74.

that influence the AI-generated work's originality.¹⁶³ Out of these three nations, it is the easiest to obtain authorship of AI-generated works in the United Kingdom, then China, then the United States.

Standardized international guidelines are essential to resolving conflicting national copyright protections. Conflicting national copyright protections are permitted under the Berne Convention as long as minimum standards are met.¹⁶⁴ This means the human programmer of an AI-generated work may be considered an author in the United Kingdom, but not China or the United States, because “national treatment,” “automatic protection,” and “independence of protection” principles only require member-countries to automatically provide foreign authors with the same protections their own nationals are given.¹⁶⁵ The country-specific patchwork of copyright protection means human programmers and companies that invest significant labor and resources into developing AI technology cannot rely on Berne Convention-exclusive rights to gain consistent revenue on an international scale.¹⁶⁶ International guidelines urging member-countries to pass legislation that adopts a singular approach would solve this problem.

In addition to severe commercial impact from significant revenue loss, conflicting national approaches undermine the core principles of copyright law, which are to promote and incentivize human creativity and innovation.¹⁶⁷ When nations have varying thresholds for AI-generated authorship, the incentive for human and corporate authors to continue investing resources into the development of AI technology is negatively impacted because inno-

163. See *id.*; Bo, *supra* note 117.

164. See *Berne Convention*, *supra* note 12, at art. 5 ¶ 1.

165. Recall that the reciprocal national treatment principle requires works originating in one of the member states to be “given the same protection” in every other member state, as the latter affords to works created by their own nationals. The automatic protection principle requires that protection in any member state cannot be conditional upon compliance with any country-specific formality. Lastly, the principle of “independence” of protection requires that the reciprocal and automatic copyright protection of a creative work is treated independently from the copyright protection in creative work's country of origin. See *Summary of the Berne Convention*, *supra* note 12; *Berne Convention*, *supra* note 12, art. 5.

166. Recall that the Berne Convention exclusive rights for copyright-eligible works that must be recognized by all member-countries include: (1) the right to translate; (2) the right to make adaptations and arrangements of the work; (3) the right to perform in public; (4) the right to recite works in public; (5) the right to communicate to the public the performance of protected works; (6) the right to broadcast; (7) the right to make reproductions in any manner or form; and (8) the right to use the work as a basis for an audiovisual work. See *Summary of the Berne Convention*, *supra* note 12; *Berne Convention*, *supra* note 12, art. 3, 8, 10^{bis}, 11, 11^{ter}, 11^{bis}, 12, 14.

167. See Guadamuz, *supra* note 1; *Copyright*, *supra* note 18.

vation is no longer rewarded with financial or reputational gain.¹⁶⁸ As AI-generated “literary and artistic works” become more popular, giant tech companies may strategically move their international development and production strategies to more favorable nations (like the United Kingdom or China) in order to guarantee authorship and copyright.¹⁶⁹ To prevent big tech companies from investing significant resources internationally, strict countries (like continental Europe, Australia, and the United States) may be open to extending authorship as long as their “human creativity in copyright law” standard is not eliminated entirely.¹⁷⁰ Member-countries following all three approaches eagerly attended the WIPO Conversation on IP and AI in order to reach a consensus regarding copyright authorship for AI-generated works.¹⁷¹ The WCT should adopt authorship guidelines for AI-generated works because member-countries want standardization that reinforces the purposes of copyright law, and therefore, WCT guidelines are very likely to be universally adopted.

The general consensus among WIPO member-countries is that standardized international guidelines for copyright authorship in AI-generated works are essential, but the proper forum to adopt the guidelines has yet to be determined.¹⁷² The WCT is the proper forum to establish standardized guidelines because the WCT’s purpose is to address intellectual property protection of works in the digital age, and any WCT amendment is applicable to Berne Convention and TRIPS Agreement member-countries.¹⁷³ Amending the WCT to include guidelines copyright authorship in AI-generated works will ensure consistency among most member-countries

168. See Guadamuz, *supra* note 1; *Summary of the Berne Convention*, *supra* note 12; *Copyright*, *supra* note 18.

169. AI is often developed outside the United States. For example, Microsoft’s “The Next Rembrandt” was created in the Netherlands and Google’s Digital News Initiative was created in the United Kingdom. See Guadamuz, *supra* note 1; see also, e.g., Gregory, *supra* note 7.

170. See *Summary of Conversation*, *supra* note 19, ¶ 74.

171. See *WIPO’s Conversation on IP and AI to Continue as a Virtual Meeting*, *supra* note 105.

172. See *Summary of Conversation*, *supra* note 19, at 9–11; *Second Session Revised Issues Paper*, *supra* note 108.

173. The Berne Convention acts as the baseline for rights and protection granted to authors, which is why the WCT and TRIPS Agreement build off of the Berne Convention copyright protections rather than proposing new entirely new international standards. See *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; see generally WCT, *supra* note 29 (including digital forms such as computer programs and databases). Additional background on the Berne Convention may be found *supra* at note 12.

with regard to copyright qualification, copyright term limits, and exclusive rights.¹⁷⁴

The WCT is best suited to “host” guideline amendments and additions because it already addresses the extension of copyright protection for literary digital works, such as copyright programs and other technological developments in the information age.¹⁷⁵ Additionally, authors of AI-generated digital works will be afforded the WCT rights to distribute, rent, and communicate the work to the public.¹⁷⁶ Similar to how the WCT and TRIPS Agreement “add on” to the Berne Convention instead of proposing new rules entirely, these proposed AI copyright authorship guidelines will “add on” to the WCT framework.¹⁷⁷ Moreover, since AI algorithms are fully derived from copyrightable computer programs, any guidelines regarding authorship for AI-generated works can be seamlessly adopted into the WCT.¹⁷⁸ The WCT should adopt authorship guidelines for AI-generated works because it is the proper forum.

B. *The WCT International Standardized Guidelines Should Be Based on China’s Copyright Authorship Legal Framework*

The WCT international standardized guidelines should be based on China’s copyright authorship framework for AI-generated works because 1) China’s approach is appropriately tailored to the level of AI technology available currently and for the foreseeable future; and 2) China’s approach will most likely appeal to countries following varied approaches.

174. See *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; see generally WCT, *supra* note 29, at arts. 4, 5 (including AI-generated works such as computer programs and data); see *Frequently Asked Questions: AI and IP Policy*, *supra* note 46. With regard to copyright term limits, duration of protection under the Berne Convention dictates that protection must be granted, at a minimum, until the expiration of the fiftieth year after the author’s death. If the AI, rather than a human, is considered the author of a work it is unclear how duration would apply since AI machines do not die. See *Summary of the Berne Convention*, *supra* note 12; Berne Convention, *supra* note 12, art. 6^{bis}, 7, 7^{bis}.

175. See *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; see generally WCT, *supra* note 29, arts. 4, 5 (including digital forms such as computer programs and databases).

176. See *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; WCT, *supra* note 29, arts. 6, 7, 8.

177. See *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; see generally WCT, *supra* note 29, arts. 4, 5 (including digital forms of computer programs and data). See also *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; *Summary of the Berne Convention*, *supra* note 12, n.1; Berne Convention, *supra* note 12.

178. See *Summary of the WIPO Copyright Treaty (WCT) (1996)*, *supra* note 13; see generally WCT, *supra* note 29, art. 4 (including reference to computer programs); *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; *What Is Artificial Intelligence*, *supra* note 47.

1. China's Copyright Authorship Legal Framework Is Appropriately Tailored to the Level of Current and Near-Future AI Technology

China's copyright authorship framework is appropriately tailored to the level of current AI technology and near-future AI development. Current AI technology has not reached the stage of "Level D" sentient sophistication to engage in any purely independent creative decisions that amount to copyright authorship under national law and international guidelines.¹⁷⁹ AI has not reached "Level D" sentience because it can neither work without human interference nor independently reprogram itself and its data.¹⁸⁰ Current levels of AI technology fall in the "Level A," "Level B," and maybe "Level C" ranges because humans are essential to the AI's functionality—programmers need to code the machine learning algorithms and define the parameters of the final AI-generated output.¹⁸¹ Therefore, current AI cannot make fully autonomous choices without the specific direction of human programmers and it is unlikely AI will reach fully sentient levels in the near future.¹⁸²

Though current AI technology is fully dependent on human programming and decision-making, human programmers cannot always predict the "total look and feel" of the final AI-generated output.¹⁸³ This lack of direct causality between human involve-

179. See *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 43; Wagner, *supra* note 35, at 531.

180. Recall the levels of AI sentience and dependability, based on decreasing order of human dependence are categorized as "Level A – Lowest degree of sophistication; can only perform operations that they have been programmed for with no operational variation; Level B – Respond to users' questions by retrieving data from external sources such as websites or applications resident on other devices; Level C – Can make autonomous decisions such as deciding what data to retrieve from which source and the manner of presenting it in response to a query; and Level D – Most sophisticated; can work without human interference. Capable of reprogramming itself and using data in any manner it wants, making its functioning identical to human behavior." *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 43; see *Frequently Asked Questions: AI and IP Policy*, *supra* note 46.

181. See *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 43; *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; Grimmelmann, *supra* note 64, at 403; Miller, *supra* note 44, at 1055–71; Clifford, *supra* note 64, at 1684–86; Wu, *supra* note 64, at 155–57; Farr, *supra* note 64, at 79–80.

182. See *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 44; *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; Grimmelmann, *supra* note 64, at 403; Miller, *supra* note 44, at 1055–71; Clifford, *supra* note 64, at 1684–86; Wu, *supra* note 64, at 155–57; Farr, *supra* note 64, at 79–80.

183. "The Next Rembrandt" is a prime example—human programmers coded the AI's machine-learning algorithms to scan data on Rembrandt's paintings, fed the AI with 346 of Rembrandt's known works, and limited the AI-generated output to a right-facing middle-aged Caucasian man wearing black clothes, a white collar, and a hat. Programmers determined that altering the algorithms would change artistic elements in the final AI-output.

ment and the final output creates the copyright authorship conundrum.¹⁸⁴ China's copyright authorship framework is the best approach for international adoption because its judicial system is deciding cases based on current levels of AI sophistication, rather than predicting what AI may look like in the distant future.¹⁸⁵ Basing standardized WCT guidelines on current AI technology will guarantee that subsequent legislation enacted by member-countries is relevant to contemporary issues and can serve as baseline measures if and when AI becomes more developed.

Modern international guidelines should not be based on what AI technology may one day look like because the guidelines can be rendered obsolete and restrict courts from ruling effectively based on common copyright principles. For example, the U.K. legislature included Section 9(3) into the Copyright, Designs, and Patents Act of 1988, which permits AI machines to be authors in computer-generated works they "arrange."¹⁸⁶ The language in Section 9(3) focuses heavily on the "skill of labor" required to arrange a work, which is a lower bar than showing the creativity and originality generally needed to merit copyright protection.¹⁸⁷ AI technology's rapid development made the CDPA's practical application confusing for English courts because Section 9(3) has not been updated or amended since 1988 and therefore rests on outdated perceptions of autonomous technology.¹⁸⁸

In contrast to the United Kingdom, the Chinese legislature passed the 2020 Copyright Law of the People's Republic of China, which remains silent on authorship in AI-generated works.¹⁸⁹ As authorship disputes about works generated by modern AI-technology became more common, the Chinese courts had the freedom to interpret national copyright principles of originality and creativity within the context of AI-generated works without legislative or

However, the human programmers could not predict exactly what the AI would generate. The final overall look and feel of "The Next Rembrandt" was unique and seemingly unpredictable, even though human programmers directly contributed to the work and the AI heavily relied on those human programming cues to generate a final copyright work. See Guadamuz, *supra* note 1; Baraniuk, *supra* note 3.

184. See *Summary of Conversation*, *supra* note 19, at 9–14.

185. See Chen, *supra* note 27 (citing *Tencent*, *supra* note 156); Chen, *supra* note 159 (citing *Golden Vision*, *supra* note 159).

186. See Bond & Blair, *supra* note 128; *CDPA*, *supra* note 124, § 9(3).

187. See *Summary of Conversation*, *supra* note 19, at 10.

188. See Bond & Blair, *supra* note 128.

189. See Bo, *supra* note 117; *International Comparative Legal Guides: Copyright 2021*, *supra* note 144.

administrative influence.¹⁹⁰ It logically follows that since UK legislators from the 1980s could not predict the level of modern AI technology, contemporary WCT international guidelines also cannot predict future AI developments. China's copyright authorship legal framework is appropriately tailored to the level of current AI technology. WCT guidelines should also be based on modern AI levels because and it is difficult to predict the future of AI development and member-countries can incrementally update their legislative and judicial copyright authorship approaches.

2. China's Copyright Authorship Legal Framework Is Most Likely to Be Adopted by the Majority of Countries Following Varied Approaches

The goal of the WCT guidelines is to provide countries with a starting legal framework for developing national legislation and ensuring standardized copyright protections among member-countries. The WCT should be amended to establish baseline international guidelines modeled after China's copyright authorship framework because China's approach is most likely to be adopted by the majority of countries that are following varied approaches.¹⁹¹ The Chinese judiciary ruled that AI-generated works have the requisite originality to constitute as copyrightable and that the human programmer or corporate entity is the author.¹⁹² The Chinese copyright authorship framework will simultaneously appease member-countries that require human creativity in their copyright law (like the United States) and member-countries that already extend copyright protection to AI-generated works (like the United Kingdom).¹⁹³ Also, China's approach provides a base framework that can be adopted seamlessly by nations

190. See Chen, *supra* note 27; Bo, *supra* note 117.

191. The three most common approaches to authorship for AI-generated works are exemplified through the copyright frameworks of the United States, United Kingdom, and China. The United States requires human creativity in copyright law and therefore lets AI-generated works fall into the public domain; the United Kingdom focuses on "sweat of the brow/skill of labor" and assigns authorship to the human programmer or AI that arranged the work, and China attributes copyright authorship to the human or corporate entity responsible for making decisions that influence the AI-generated work's originality. See *Summary of Conversation*, *supra* note 19, at 10; Bo, *supra* note 117.

192. See Chen, *supra* note 27; Bo, *supra* note 117.

193. See *Summary of Conversation*, *supra* note 19, at 10.

that already have comprehensive AI authorship legislation¹⁹⁴ and by nations that have no concrete AI authorship policies.¹⁹⁵

a. Member-Countries That Require Originality in Their Copyright Law

Member-countries that require human creativity and originality in their copyright law will likely accept WCT guidelines based on China's approach because the guidelines can be seamlessly adopted into their national copyright laws. Originality means the author's creative expression must be novel (cannot use of copyrighted elements in another's work) and requires authors to express a low level of unique skills and judgment in their works.¹⁹⁶ The Chinese judiciary's 2020 rulings in *Tencent* and *Golden Vision* extended copyright protection to AI-generated works because human intellectual choices and creativity influenced the originality of the final AI output.¹⁹⁷ Countries following the U.S. approach hesitate to extend copyright protection to AI-generated works because it is not always clear how exactly the human programmer creatively contributed to the final output's originality. By this interpretation, the AI is viewed as an independent creator rather than a tool.¹⁹⁸ China once followed the strict U.S. approach as well, but in 2020 it interpreted core copyright principles of originality and creativity within the context of AI-generated works.¹⁹⁹ Countries following the U.S. approach can follow in China's footsteps by implementing the same logical steps.

China's judiciary has determined that an AI-generated work's originality is dependent on creative choices made by human pro-

194. See CDPA, *supra* note 124, § 9(3); Fitzgerald et al., *supra* note 132.

195. See U.S. COPYRIGHT OFF., COMPENDIUM OF U.S. COPYRIGHT OFFICE PRACTICES, *supra* note 122, §§ 306, 313.2 (The U.S. Copyright Office's Compendium of Best Practices states that AI-generated works, even if they are creative and original, are not copyrightable because copyrighted works need to be human-made, and AI is non-human; see generally 17 U.S.C. § 101 (including no mention of AI-generated or non-human made works in the definitions)).

196. See Wagner, *supra* note 35, at 528.

197. See Chen, *supra* note 27 (citing *Tencent*, *supra* note 156); Chen, *supra* note 159 (citing *Golden Vision*, *supra* note 159); Ma, et al., *supra* note 158.

198. See 17 U.S.C. § 102(a) ("Copyright protection subsists, in accordance with this title, in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device"); U.S. COPYRIGHT OFF., COMPENDIUM OF U.S. COPYRIGHT OFFICE PRACTICES, *supra* note 122, § 306; Pearlman, *supra* note 123, at 15.

199. See Chen, *supra* note 27 (citing *Tencent*, *supra* note 156); Chen, *supra* note 159 (citing *Golden Vision*, *supra* note 159); Ma, et al., *supra* note 158.

grammers, even if the output *seems* random and autonomous to the ordinary observer.²⁰⁰ Before China came to this conclusion, it used to follow the strict U.S. approach.²⁰¹ In *Baidu Network*, the court held that an AI-generated legal report—where the human set search conditions, applied search term filters, and clicked “visualize” to create a report—was not protected by copyright.²⁰² The *Baidu Network* court stated that though originality in the work may exist because a human chose search terms and filtered content, the final report was not directly created by a natural person, but rather a non-human AI.²⁰³ The U.S. Copyright Office similarly stated that an AI-generated “weaving process that randomly produces irregular shapes in the fabric” does not have copyright protection because a non-human AI, not a natural person, seemingly created the final output.²⁰⁴ U.S. courts have accordingly declined to extend authorship to non-humans.²⁰⁵ Since AI does not have the conscience to make creative decisions, both China and the United States currently decline to extend authorship to AI machines.²⁰⁶

The shift in China’s judiciary eliminated the myth that AI output is removed from creative and original human decision-making. Member-countries following the strict U.S. approach should do the same by adopting the proposed WCT guidelines based on China’s legal framework. In *Tencent* and *Golden Vision*, the Chinese courts held that human decisions influenced and impacted the originality of the AI-generated work, and therefore merited copyright protection with the human programmer or corporate entity as the author.²⁰⁷ In *Tencent*, human programmers created an AI that generated 300,000 news articles per year, and the court extended copyright protection, with the corporation as an author, because human intelligence, creativity, and labor were apparent in the writing style and phrasing of the AI-generated articles.²⁰⁸

200. See Chen, *supra* note 27 (citing *Tencent*, *supra* note 156); Chen, *supra* note 159 (citing *Golden Vision*, *supra* note 159); Ma, et al., *supra* note 158.

201. See *Baidu*, *supra* note 153; He, *supra* note 153.

202. See *Baidu*, *supra* note 153; He, *supra* note 153.

203. See *Baidu*, *supra* note 153; He, *supra* note 153.

204. See U.S. COPYRIGHT OFFICE, COMPENDIUM OF U.S. COPYRIGHT OFFICE PRACTICES, *supra* note 122, § 313.2.

205. See *Naruto v. Slater*, 888 F.3d 418, 424–25 (9th Cir. 2018); *Photographer ‘Lost £10,000’ in Wikipedia Monkey ‘Selfie’ Row*, *supra* note 126.

206. See *International Comparative Legal Guides: Copyright 2021*, *supra* note 144; Bo, *supra* note 117; *Naruto*, 888 F.3d at 424–25; *Photographer ‘Lost £10,000’ in Wikipedia Monkey ‘Selfie’ Row*, *supra* note 126.

207. See Chen, *supra* note 27 (citing *Tencent*, *supra* note 156); Chen, *supra* note 159 (citing *Golden Vision*, *supra* note 159); Ma, et al., *supra* note 158.

208. See Chen, *supra* note 27 (citing *Tencent*, *supra* note 156); Ma, et al., *supra* note 158.

Similarly, in *Golden Vision*, the Chinese court held that humans authored autonomously captured aerial photographs because humans made creative decisions influencing the high-altitude photographs such as the shooting angle, video recording mode, and video display format.²⁰⁹ Originality is a low threshold because the purpose of copyright is to spur innovation and creativity.²¹⁰ Member-countries following the strict U.S. approach should adopt China's interpretation that human programming and creative decision-making influences originality in AI-generated works because this interpretation complies with copyright law's core principles and purposes. Member-countries that require human creativity and originality in their copyright law will likely accept WCT guidelines based on China's approach because the guidelines can be seamlessly adopted into their already existing national copyright laws.

b. Effect on Member-Countries that Have Already Extended Human Authorship to AI-Generated Works

Member-countries that already extend human authorship to AI-generated works will not be significantly affected by the WCT guidelines because the proposed guidelines are a baseline, non-mandatory framework that nations can expand upon for their own purposes. These member-countries are likely to support the proposed standardized WCT guidelines because they do not have to alter their existing copyright frameworks and because their author's AI-generated works will be protected in more member-countries. Member-countries that already extend copyright protection to AI-generated works can do so in two ways: 1) by requiring originality in order to establish human authorship in AI-generated works (Chinese approach), or 2) by implementing a standard that is lower than originality, like "skill of labor," in order to establish human authorship in AI-generated works (U.K. approach).²¹¹ Member-countries that have adopted the Chinese approach through national legislation will not be affected by the WCT guidelines. Member-countries that adopted the Chinese approach through their judiciary will be urged, but not required, to include the WCT guidelines into their national copyright legislation.

A member-country that permits human authorship of AI-generated works, but does not use the originality standard for copyright

209. See Chen, *supra* note 159 (citing *Golden Vision*, *supra* note 159).

210. See Wagner, *supra* note 35, at 528.

211. See *Summary of Conversation*, *supra* note 19, at 10; Bo, *supra* note 117.

protection is the United Kingdom.²¹² Article 9(3) of the CDPA states that “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 work are undertaken.”²¹³ The CDPA omits originality from their definition of qualifying copyrightable works.²¹⁴ The U.K.’s “skill of labor” standard is a lower bar than the Chinese “originality” standard because “skill of labor” only requires arranging a work, whereas originality requires human creativity in arranging and producing the work.²¹⁵ Therefore, any work that meets the “originality” standard has automatically fulfilled the lower “skill of labor” standard and is protected in both China and the United Kingdom.²¹⁶

Authors from countries without originality requirements that want reciprocal “national treatment” protection in member-countries with originality requirements simply need to show that their original, creative choices influenced the final AI output.²¹⁷ Since AI is fully reliant on human decision-making, this originality showing is not a high barrier for authors.²¹⁸ Overall, member-countries that already extend copyright protection to human authors for AI-generated works will not be significantly affected by WCT guidelines modeled after China’s approach because the baseline standardization goal—for human programmers/corporate entities to be deemed the authors of their AI-generated works—is already met.

IV. CONCLUSION

The rapid development of machine learning technology coupled with the growing prevalence of and dependence on AI-generated works necessitates an international legal framework for determining copyright protection. The WIPO Copyright Treaty should be

212. See CDPA, *supra* note 124, § 9(3); *Summary of Conversation*, *supra* note 19, at 10.

213. CDPA, *supra* note 124, § 9(3).

214. See *Summary of Conversation*, *supra* note 19, at 10.

215. See *id.* at 9–11; CDPA, *supra* note 124, § 9(3); Chen, *supra* note 159; Chen, *supra* note 27 (citing *Tencent*, *supra* note 156).

216. See CDPA, *supra* note 124, § 9(3); *Summary of Conversation*, *supra* note 19, at 9–11; Chen, *supra* note 159; Chen, *supra* note 27 (citing *Tencent*, *supra* note 156).

217. See Chen, *supra* note 159. The reciprocal national treatment principle requires works originating in one of the member states to be “given the same protection” in every other member state, as the latter affords to works created by their own nationals. See *Summary of the Berne Convention*, *supra* note 12; Berne Convention, *supra* note 12, art. 5.

218. See *Frequently Asked Questions: AI and IP Policy*, *supra* note 46; *Who Would Own Copyright in a Poem Written by AI?*, *supra* note 44; see Andrew Currier, *Are We Ready to Name AI as an Inventor of Patents?*, PCK INTELLECTUAL PROPERTY (Aug. 2021), <https://www.pckip.com/article/ai-inventor-patents>.

amended to establish baseline international guidelines, based on China's copyright legal framework, that attribute copyright authorship to the human or corporate entity responsible for making decisions that influence the AI-generated work's original and creative expression. The proposed framework in this Note provides countries with a starting point in developing national legislation and ensuring standardized copyright protections between member-countries.

The next hurdle the international IP community needs to tackle is whether fully sentient autonomous AI should retain copyright in the works they generate. This is not a present-day issue, but the potential development of sentient AI raises interesting questions. Are sentient AI machines incentivized by the economic and moral rights that are at the core of copyright law? If and when AI becomes fully sentient, will establishing an updated copyright framework really be the most pressing issue for society? Creating contemporary copyright authorship regulations for sentient AI is premature because they will likely be outdated by the time AI becomes fully autonomous. These questions should only be considered once society has a firm grasp on how sentient AI operates, what motivates the machines, and how society plans to utilize sentient AI.