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Our Brains Beguil'd: Copyright Protection for AI Created Works

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Introduction

At a January 31 conference on "Artificial Intelligence: Intellectual Property Policy Considerations" the United States Patent and Trademark Office ("USPTO") explored several challenges presented by Artificial Intelligence ("AI") technologies in the creation of intellectual property ("IP").[1] The agenda for the conference covered the spectrum of IP topics as they relate to the intersection of the law and the creations of AI.[2] In the copyright arena, several questions of interest came to the forefront, primarily the issues of authorship in AI-generated content, copyrightability of such works, and implications of usage of protectable works by AI.[3] Following the January conference, on August 27, 2019, the USPTO published a request for public comments to questions related to the impact of AI inventions on patent law and policy.[4] Shortly after, the USPTO followed with another set of questions specifically seeking comment on the impact of AI in the context of copyright law.[5] This article seeks to examine the questions raised in this second Request for Comments on October 30, 2019, that deal with AI-created copyright protectable content and how to best address those questions. The discussion here is about the possible protectability for the work created by an AI and not for the protectability under copyright law of the AI itself. The article will focus on two specific areas: the state of protectability of AI-created content under the current legal framework and the potential changes necessary to the current system if AI-created content should become protectable.

Part I of this article will provide background on AI systems, how they function and how they fit into the creative art arena covered by copyright

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1. *Artificial Intelligence: Intellectual Property Policy Considerations*, U.S. PAT. & TRADEMARK OFF. (Jan. 31, 2019), https://www.uspto.gov/about-us/events/artificial-intelligence-intellectual-property-policy-considerations [https://perma.cc/8DAN-Y6HM].

2. U.S. PAT. & TRADEMARK OFF., ARTIFICIAL INTELLIGENCE: INTELLECTUAL PROPERTY POLICY CONSIDERATIONS (2019), https://www.uspto.gov/sites/default/files/documents/AIconference-agenda_FINAL.pdf [https://perma.cc/YA63-XT3V].

3. *Artificial Intelligence: Intellectual Property Policy Considerations, supra* note 1.

4. Request for Comments on Patenting Artificial Intelligence Inventions, 84 Fed. Reg. 44,889 (Aug. 27, 2019).

5. Request for Comments on Intellectual Property Protection for Artificial Intelligence Innovation, 84 Fed. Reg. 58,141 (Oct. 30, 2019).

law. This part will discuss the difference between generative and creative AI and how AI might substitute for human creation. Part I will also discuss the current legal framework surrounding the foundation of the originality, authorship, and human creation requirements in copyright law. Part II will examine the six copyright specific questions in the USPTO's second request for comments, focusing on the current state of copyright law. Part III will examine the justifications for protection of works created by AI and whether or not there are reasons to protect works created by AI.

I. BACKGROUND

A. WHAT IS AI?

AI is a broad field of study and a definition will vary greatly by the discipline in which it is contained. The definitions of AI are as varied as the different types of AI systems.[6] For a computer scientist, AI will comprise computer programs that exhibit intelligent behavior and can engage in planning, translate languages, make expert selections, or perform simple and complicated tasks.[7] For engineers, AI will refer to machines that perform simple or complex tasks usually carried out by humans, while for a cognitive scientist, AI refers to models of human intelligence that culminate in supervised or unsupervised learning of algorithms.[8] AI is therefore an overarching term that spans multiple disciplines but that can be oversimplified as computer systems created to "mimic human behaviour [*sic*]."[9] Generally, AI can be categorized into two broad descriptions, "a system capable of performing tasks that would normally require human intelligence, such as recognition, decision-making, creation, learning, evolving, and communicating" or an instrument that can make existing solutions more efficient by using all data that is reachable by the AI system.[10] For the purposes of this article, we will focus on those models of Generative Adversarial Networks ("GANs") and Creative Adversarial Networks ("CANs") that are used to produce works that would be subject to copyright protection under title 17 U.S. code section 102 if created by a human.

Adversarial networks are primarily supervised learning models in which programmers feed data to the network and the network learns from the choices it makes.[11] Developers of AI adversarial networks recognize that the way the system learns might not necessarily be readily apparent or

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6. Shlomit Yanisky-Ravid, *Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era—The Human-Like Authors Are Already Here–A New Model*, 2017 MICH. ST. L. REV. 659, 672–73 (2017).

7. George M. Whitson, *Artificial Intelligence*, in SALEM PRESS ENCYCLOPEDIA OF SCIENCE (2020).

8. *Id.*

9. JOSEF DREXL ET AL., TECHNICAL ASPECTS OF ARTIFICIAL INTELLIGENCE: AN UNDERSTANDING FROM AN INTELLECTUAL PROPERTY LAW PERSPECTIVE (2019).

10. Yanisky-Ravid, *supra* note 6, at 673–74.

11. Jason Brownlee, *A Gentle Introduction to Generative Adversarial Networks*, MACH. LEARNING MASTERY (July 19, 2019), https://machinelearningmastery.com/what-are-generative-adversarial-networks-gans/ [https://perma.cc/8AF3-MTAS].

understood and that it is easier to train the system by giving it a training set of desired outputs.[12] Both GANs and CANs operate based on variations of this concept of training sets. GANs "have two sub networks, a generator and a discriminator."[13] The discriminator is loaded with a set of data that it uses as a training set.[14] The training set is divided into classifications and the algorithm "tries to identify hidden insights, similarities, patterns, and connections—without being explicitly programmed on where to look."[15] The discriminator then uses this set to discriminate between the "real" data included in the training set and the "fake" data created by the generator.[16] The generator attempts to generate data that would be similar to the training data but has no access to the training data.[17] Without access to the training data in the discriminator, the generator can only begin by generating random images and, as it communicates those images to the discriminator, the generator receives reinforcement from the discriminator as the discriminator finds the data to be real (similar to the data in the training set) or fake (data not similar to the training set).[18] When the system reaches equilibrium the discriminator will not be able to tell the difference between the images generated by the generator and the actual images in the training set.[19] In a visual arts example, the discriminator is loaded with all of the paintings by Rembrandt and the generator is set up to create paintings without access to the Rembrandt paintings. The generator then creates paintings and feeds them to the discriminator which rejects those paintings that do not match the characteristics of Rembrandts and feeds those that do back to the generator. The generator uses this feedback to learn to create more paintings based on the Rembrandt characteristics and feeds them back to the discriminator. This loop then goes on until the system reaches balance and the discriminator can no longer tell the difference between a real Rembrandt in the training set and a fake Rembrandt created by the generator.[20]

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12.   Yanisky-Ravid, *supra* note 6, at 677.

13.   Ahmed Elgammal et al., *CAN: Creative Adversarial Networks, Generating "Art" by Learning About Styles and Deviating from Style Norms* (June 21, 2017, 6:05 PM), https://arxiv.org/abs/1706.07068 [https://perma.cc/F7U8-5VY7].

14.   *Id.*

15.   Yanisky-Ravid, *supra* note 6, at 676.

16.   Elgammal et al., *supra* note 13.

17.   *Id.*

18.   *Id.*

19.   *Id.*

20.   *See generally* Yanisky-Ravid, *supra* note 6. *See also* NEXT REMBRANDT, https://www.nextrembrandt.com/ [https://perma.cc/ASG2-QQVU]. In 2016, the Dutch bank ING, in collaboration with Microsoft, Delft University, and two Dutch art museums, unveiled a project to have an AI-created portrait that would resemble a Rembrandt portrait but would still be an original portrait. *Id.* The two-year project collected a database of Rembrandt works tagged by humans and collated by computer to discover the patterns common to Rembrandt portraiture. *Id.* Then the project engineers developed the algorithms that would create an output resembling Rembrandt's style. *Id.* The algorithm was intentionally limited to produce a portrait of a Caucasian male between the ages of thirty and forty, with facial hair, wearing black clothes with a white collar and a hat, facing to the right. *Id.* The algorithm then went to work through the discriminating and generating process to produce the portrait now known as The Next Rembrandt. *Id.*

The primary issue with GANs-generated works is that they would in time lack originality. The generator is trained by the system to reach equilibrium and fool the discriminator into seeing generator data as coming from the training set. In this closed loop system, the generator lacks a driving force to create, to build something that is not in the training set and would eventually end up replicating the training set.[21]

The next step in the evolution of AI goes from being emulative, like GANs, to being creative, like CANs.[22] In CANs,

> the generator is designed to receive two signals from the discriminator that act as two contradictory forces to achieve three points: 1) generate novel works, 2) the novel work should not [be] too novel, i.e., it should not be too far away from the distribution or it will generate too much arousal, thereby activating the aversion system and falling into the negative hedonic range according to the Wundt curve,[23] 3) the generated work should increase the stylistic ambiguity.[24]

CANs, like GANs, have two adversarial networks.[25] In CANs, the generator does not have a training set but has access instead to a set of data associated with a particular style and uses that set to discriminate between styles.[26] Like in GANs, the generator would not have any access to the data and would generate data starting at a random point.[27] Unlike in GANs, however, the generators in CANs receive two different signals for the data they create.[28]

The first signal from the discriminator tells the generator whether the generated data falls within or without the parameters of the styles the generator has access to.[29] This signal tells the generator whether the discriminator places the generated data in the same distribution as the set of data the discriminator knows about.[30] The signal tells the generator whether the discriminator thinks the image presented falls within the parameters and since the generator only receives this signal, it will eventually generate more data within the original parameters.[31]

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21.   Elgammal et al., *supra* note 13.

22.   *Creative Adversarial Networks for Art Generation with Ahmed Elgammal*, at 4:30, TWIML (May 13, 2019), https://twimlai.com/twiml-talk-265-creative-adversarial-networks-for-art-generation-with-ahmend-elgammal/ [https://perma.cc/7ZR2-GKWF].

23.   The Wundt Curve is a bell-shaped curve illustrating that as a stimulus intensity (e.g., light) increases from low to moderate levels, its effect is pleasant or rewarding, but that as it increases to higher levels, its effect is unpleasant and even painful. *Wundt Curve*, APA DICTIONARY PSYCH., https://dictionary.apa.org/wundt-curve [https://perma.cc/SZ36-J22N]. The Wundt curve has been related to theories of human motivation, novelty seeking, and aesthetics. *Id.*

24.   Elgammal et al., *supra* note 13.

25.   *Id.*

26.   *Id.*

27.   *Id.*

28.   *Id.*

29.   *Id.*

30.   *Id.*

31.   *Id.*

The second signal tells the generator how the discriminator classifies the created data into the styles the discriminator holds.[32] When the generator generates images that fall within the parameters held by the discriminator and that the discriminator can easily classify into one of its styles, the generator would have created something that the discriminator would believe fits into the held styles.[33] These two systems push against each other, pushing the innovation and limiting it at the same time.[34] The creative generator will try to generate data that confuses the discriminator into thinking the new data falls within the set and is part of the styles in that set.[35] The important distinction is that in CANs the generator creates something outside the contained universe of the training set, because, by definition, CANs will create things that did not exist before.[36]

B.   THE LEGAL FRAMEWORK FOR PROTECTING AI CREATED WORKS

The question of whose work ought to deserve protection predates the AI era. In the late nineteenth century, the birth of photography as an art form led to the legal questions over the standing of the output of a mechanical process in relation to authorship.[37] From the early photography cases, "the analysis focused on the role of the human author not only on imagining what the work would look like, but in controlling the process of its materialization."[38]

1.   What is Authorship?

The seminal United States ("U.S.") case on photography is *Burrow-Giles v. Sarony.*[39] In *Burrow-Giles*, Napoleon Sarony, a New York celebrity photographer who was quite a celebrity himself, contracted with playwright, author, and super-celebrity Oscar Wilde to create a series of portraits of Wilde.[40] Sarony made his money by photographing the notables of his time and paying them dearly for the rights to sell the photographs to the public, who snapped them up at a premium.[41] Sarony created a series of twenty-seven portraits of Wilde in different poses and costumes.[42] One of these photos, Oscar Wilde No. 18, became the subject of the case in question when Ehrich Brothers, a New York department store, hired Burrow-Giles Lithographic

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32.   *Id.*

33.   *Id.*

34.   *Creative Adversarial Networks for Art Generation with Ahmed Elgammal, supra* note 22, at 12:00.

35.   Elgammal et al., *supra* note 13.

36.   *Creative Adversarial Networks for Art Generation with Ahmed Elgammal, supra* note 22, at 19:50.

37.   Jane C. Ginsburg & Luke Ali Budiardjo, *Authors and Machines,* 34 BERKELEY TECH. L.J. 343, 354–55 (2019).

38.   *Id.*

39.   Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53 (1884).

40.   *Id.*

41.   Mitch Tuchman, *Supremely Wilde,* SMITHSONIAN MAG. (May 2004), https://www.smithsonianmag.com/arts-culture/supremely-wilde-99998178/ [https://perma.cc/PGY8-S23V].

42.   *Id.*

Company to turn the photo into an advertisement for a line of hats.[43] Sarony sued Burrow-Giles for infringement of his copyright by the reproduction of at least 85,000 copies of Oscar Wilde No. 18 in their ad for Ehrich Bros.[44] Burrow-Giles' defense on appeal rested on two points: the lack of constitutional right of Congress to include photographs as protectable by copyright law and the lack of proper copyright notice given by Sarony.[45] The Court made short order of the second argument but addressed the first in depth.[46] The Court ruled that Sarony's portrait of Wilde was: "[A]n original work of art, the product of plaintiff's intellectual invention, of which plaintiff is the author, and of a class of inventions for which the Constitution intended that Congress should secure to him the exclusive right to use, publish and sell. . . ."[47]

More importantly, the Court stated that an author is "he to whom anything owes its origin; originator; maker; one who completes a work of science or literature."[48]

2. What is Original?

The next step in the evolution of the authorship idea came from *Bleistein v. Donaldson*.[49] *Bleistein* is one of the most important developments in American Copyright Law, covering three overlapping concepts in the law.[50] This decision recognized commercial art as worthy of protection, gave a minimalist approach to the originality requirement, and entrenched the ideological and conceptual themes supporting that minimalist approach to originality.[51] *Bleistein* was a simple case based on a dispute between two lithographing companies, the Courier Lithographing Company and the Donaldson Lithographing Company, over the reprinting of circus posters copied by Donaldson from the originals created by Courier.[52] Donaldson argued that advertising posters were not protected by copyright and the trial court agreed.[53] The Sixth Circuit agreed with the trial court, stating:

> If a chromo, lithograph, or other print, engraving, or picture has no other use than that of a mere advertisement and no value aside from this function, it would not be promotive of the useful arts, within the meaning of the constitutional provision, to protect the 'author' in the exclusive use

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43. *Id.*

44. *Id.*

45. *Burrow-Giles*, 111 U.S. at 55.

46. *Id.* at 55–56.

47. *Id.* at 60.

48. *Id.* at 57–58.

49. Bleistein v. Donaldson Lithographing Co., 188 U.S. 239 (1903).

50. Oren Bracha, *Commentary on:* Bleistein v. Donaldson Lithographing Co. *(1903)*, COPYRIGHT HIST.: PRIMARY SOURCES ON COPYRIGHT 1450–1900 (2008), http://copyrighthistory.org/cam/tools/request/showRecord.php?id=commentary_us_1903#_ednref44 [https://perma.cc/TM2W-YJ2A].

51. *Id.*

52. *See generally Bleistein*, 188 U.S. 239.

53. Bracha, *supra* note 50.

thereof, and the copyright statute should not be construed as including such a publication.[54]

The Sixth Circuit based its decision on *Burrow-Giles* where the Supreme Court found Sarony had made a substantial creative contribution with the photograph, embodying "his own original mental conception."[55] The court followed the observation in *Burrow-Giles* that because of the lack of an examination process in the copyright system it is "much more important that when the supposed author sues for a violation of his copyright, the existence of those facts of originality, of intellectual production, of thought, and conception on the part of the author should be proved, than in the case of a patent right."[56]

The Supreme Court, in a divided opinion, sided with Courier and a broader view of the originality requirement.[57] Justice Holmes, writing for the majority, created the minimalist approach to originality in copyright law.[58] Holmes proposed that all that was needed for protection under the act was a minimal amount of creative genius when he stated:

> The copy is the personal reaction of an individual upon nature. Personality always contains something unique. It expresses its singularity even in handwriting, and a very modest grade of art has in it something irreducible, which is one man's alone. That something he may copyright unless there is a restriction in the words of the act.[59]

Holmes' rule for the minimalist approach requiring only a "modest grade of art" does include the caveat that the irreducible something in the art is "one man's alone," implying human creation.[60]

3. Who Can Be an Author?

Over a hundred years later, in *Naruto v. Slater*, we returned to a photography case to cement the concept of human creation.[61] In 2011, David Slater, a wildlife photographer, left a camera unattended in a wildlife preserve in Indonesia.[62] One of the crested macaques living on the preserve, Naruto, used the opportunity to take several selfies with the unattended camera.[63] Whether Slater intended for the macaques to use the camera or not is unclear, as he has maintained that he coaxed them into picking up the cameras, looking into the lenses and pressing the shutter, making the resulting photos

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54.   *Id.* (quoting Courier Lithographing Co. v. Donaldson Lithographing Co., 104 F. 996 (6th Cir. 1900)).

55.   Bracha, *supra* note 50 (quoting Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53, 59–60 (1884)).

56.   *Id.*

57.   *See generally Bleistein*, 188 U.S. 239.

58.   Bracha, *supra* note 50.

59.   *Bleistein*, 188 U.S. at 250.

60.   *Id.*

61.   Naruto v. Slater, 888 F.3d 418 (9th Cir. 2018).

62.   *Id.* at 420.

63.   *Id.*

of Naruto a product of Slater's ingenuity.[64] Slater has stated that Naruto's selfies where not "serendipitous monkey behavior" but rather the result of Slater's "perseverance, sweat and anguish. . . ."[65] Slater did claim that one of the selfies taken by Naruto was an "astounding, once-in-a-lifetime shot that captured an expression of pure joy and self-awareness on the monkey's face."[66] Slater was so delighted with the results that he had his agent circulate the photo to several news sources for possible publication.[67] Two of the selfies taken by Naruto were published by the Daily Mail and eventually the photos went viral.[68] Slater published the selfies in a book he created through Blurb[69] and identified himself and his company, Wildlife Personalities, Ltd., as the copyright owners of the photographs.[70] Throughout the book, Slater admitted that Naruto had taken the photographs he published.[71]

But in every life a little rain must fall, and by 2014 the blog, Techdirt and Wikipedia, were using the photographs taken by Naruto on their sites without permission from Slater and tagging them as items in the public domain.[72] Slater tried to assert his right, asking the websites to stop using the photos, but both websites refused, claiming the photographs were unprotectable because they were created by a monkey.[73] To make matters worse for Slater, People for the Ethical Treatment of Animals ("PETA") filed a complaint for copyright infringement in California against Slater on behalf of Naruto.[74] PETA asserted copyright ownership for Naruto on the basis that the photographs "resulted from a series of purposeful and voluntary actions by Naruto, unaided by Mr. Slater, resulting in original works of authorship not by Mr. Slater, but by Naruto."[75] The district court sided with Slater and granted his motion to dismiss on the grounds of lack of statutory standing for Naruto.[76] PETA appealed the district court's decision, but the Ninth Circuit upheld that decision.[77] The court reasoned that the Act does not "expressly authorize animals to file copyright infringement suits under the statute" and

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64.   Julia Carrie Wong, *Monkey Selfie Photographer Says He's Broke: 'I'm Thinking of Dog Walking'*, GUARDIAN (July 12, 2017, 8:22 PM), https://www.theguardian.com/environment/2017/jul/12/monkey-selfie-macaque-copyright-court-david-slater [https://perma.cc/CJC8-EN2P].

65.   *Id.*

66.   Andres Guadamuz, *Can the Monkey Selfie Case Teach Us Anything About Copyright Law?*, WORLD INTELL. PROP. ORG. MAG. (Feb. 2018), https://www.wipo.int/wipo_magazine/en/2018/01/article_0007.html.

67.   *Id.*

68.   *Id.*

69.   BLURB, INC., https://www.blurb.com/ [https://perma.cc/P3AU-VX2G]. Blurb is an online commercial printing service in which individuals may self-publish and sell their works. *Id.*

70.   *Naruto v. Slater*, 888 F.3d 418, 421 (9th Cir. 2018).

71.   *Id.*

72.   Wong, *supra* note 64.

73.   *Id.*

74.   *Naruto*, 888 F.3d at 420.

75.   Guadamuz, *supra* note 66.

76.   *Naruto*, 888 F.3d at 421.

77.   *Id.* at 421.

that the terms used to indicate who may inherit the right implied humanity, excluding animals from the possibility of claiming authorship on a work.[78]

The development of the concepts or authorship, originality, and creation outlined in *Burrow-Giles*, *Bleistein* and *Naruto* firmly establish the necessity of human involvement. As the law stands today, AI-made works would lack that essential element necessary to achieve authorship, originality, or creation in order to deserve copyright protection.

II.   THE SIX COPYRIGHT QUESTIONS

A.   SHOULD WORK PRODUCED BY AI BE PROTECTED?

U.S. copyright law is derived from the copyright and patent clause in the Constitution granting Congress the power to enact patent and copyright laws to "promote progress of science and the useful arts" by providing "authors and inventors" with exclusive rights for a limited time.[79] In the context of copyright, the language of article 1, section 8, clause 8 refers to authors and while it does not limit authorship, we can safely assume the term authors, as it was understood by the Framers, referred to human authorship. The Copyright Act does not require human authorship, it merely states that copyright subsists in original works of authorship fixed in a tangible medium of creation.[80] The *Compendium of U.S. Copyright Practices*, however, stipulates that the Copyright Office will "register an original work of authorship, provided that the work was created by a human being."[81] The *Compendium* is the first place where we find a requirement for human authorship invalidating registration for any creation by a non-human.[82] The Compendium, however, is an internal document of the USPTO lacking the force of law.[83] Case law supports the assertion that authorship is conditional on creation by a human actor. In *Burrow-Giles* the Court laid the foundation that an author is anyone "to whom anything owes its origin; originator; maker; one who completes a work of science or literature" and that a Writing is the process "by which the ideas in the mind of the author are given visible expression."[84] However, the support for that assertion of human authorship is only implied, as the Court in *Burrow-Giles* never directly addressed the issue of a requirement for a human author.[85]

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78.   *Id.* at 426.

79.   U.S. CONST. art. I, § 8, cl. 8.

80.   17 U.S.C. § 102 (2020).

81.   U.S. COPYRIGHT OFF., COMPENDIUM OF U.S. COPYRIGHT OFFICE PRACTICES § 306 (3d ed. 2017), https://www.copyright.gov/comp3/docs/compendium.pdf [https://perma.cc/K9WV-6WZ4] [hereinafter COMPENDIUM, 3d.].

82.   Yanisky-Ravid, *supra* note 6, at 719.

83.   *Id.*

84.   Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53, 57–58 (1884).

85.   Victor M. Palace, *What if Artificial Intelligence Wrote This? Artificial Intelligence and Copyright Law*, 71 FLA. L. REV. 217, 230 (2019) (citing *Burrows-Giles*, 111 U.S. at 54–56).

Twenty years after *Burrow-Giles*, the Court expanded on the concept of authorship in *Bleistein* by stating that a "very modest grade of art has in it something irreducible, which is one man's alone. That something he may copyright."[86] That pronouncement by the Court in *Bleistein* secures a position for human creation; however, *Bleistein* also lays the foundation for the works made for hire doctrine.[87] The argument in favor of authorship by non-humans is linked to the works made for hire doctrine because the doctrine recognizes authorship in legal persons when an employee creates a work of authorship within the scope of their employment or an independent contractor creates a work for an employer within the statutory definition of a work made for hire.[88] In either case, the copyright in the resulting work goes to an "author" who is not the creator of the work. Despite the statutory recognition of ownership in works of authorship created for a legal person, the statute leaves no doubt of the fact that the creator of the work made for hire is the human person.[89]

Finally, in *Naruto v. Slater*, the Ninth Circuit concluded that non-humans lack standing under the Copyright Act.[90] Here the court based its conclusion on the USPTO's own policy recognizing only human authorship as worthy of registration.[91] The USPTO's policy on the requirement for human authorship is, in itself, based on the court's earlier decision in the *Trademark Cases*, where the Court defined copyright as protecting "the fruits of intellectual labor" "founded in the creative powers of the mind."[92] Although the *Trademark Cases* stand for the proposition that Congress lacked the authority to regulate marks under the "Writings" language of the Progress Clause, the fact that "trademarks have little in common with works made by nonhumans" undermines the foundation of the USPTO's policy on human authorship.[93]

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86. Bleistein v. Donaldson Lithographing Co., 188 U.S. 239, 250 (1903).

87. *Id.* (establishing that the employer had the right to the work product of an employee).

88. 17 U.S.C. §101 (2020).

89. *Id.*

90. Naruto v. Slater, 888 F.3d 418, 420 (9th Cir. 2018).

91. COMPENDIUM, 3d, *supra* note 81, § 306.

92. Trade-Mark Cases, 100 U.S. 82, 94 (1879). In 1879, the Supreme Court addressed three criminal cases on the issue of marks used in the sale of alcohol products, *U.S. v. Steffens, U.S. v. Wittemann,* and *U.S. v. Johnson,* under the label of the *Trademark Cases. Id.* at 82–83. All three cases dealt with the counterfeiting of marks associated with champagne and whiskey and the constitutionality of the 1870 Trademark Act and its foundation on Article 1, section 8, clause 8, the Progress Clause. *Id.* at 86. The Court found that the existing law was lacking in its foundation on the Progress Clause. *Id.* The decision goes on to state that the Commerce Clause delegates to Congress "the power to regulate commerce with foreign nations, and among the several states, and with the Indian tribes," excluding commerce that takes place entirely within one state. *Id.* at 86–87. The existing statute had "no requirement that [a trademark owner] shall be engaged in the kind of commerce which Congress is authorized to regulate," and was instead intended "to establish a universal system of trademark registration . . . without regard to the character of trade to which it was to be applied or the residence of the owner." *Id.* at 97. Due to this expansive breadth, the court found that the statute necessarily regulated a type of commerce that Congress had no power to regulate, and so was unconstitutional. *Id.* at 98–99.

93. Palace, *supra* note 85, at 229.

The fundamental issue with protecting AI works is one of creativity; *i.e.* is AI able to create? The primary argument against creation by AI as opposed to human intelligence is that of the closed universe presented by training sets.[94] In human intelligence, the training set is only limited by the experiences of the author and while an infinite training set could be imagined for AI, that model would be so costly in both time and effort that it can be excluded as a possibility.[95] For the AI outcome to be creative and worthy of protection, it would have to "1) be novel and useful, 2) demand that we reject ideas we have previously accepted, 3) result from extreme motivation and persistence and 4) come from clarifying a problem that was originally vague."[96] Novelty and usefulness are the preserve of patent law[97] and the first criterion must be modified to creativity and originality when dealing with copyright.[98] The second criterion is closely tied to the first because in artistic creation there is a constant struggle between innovation and habituation, a drive towards the new that receives push back from the established.[99] Artists have to push against the conventionally established habituation to arrive at innovation but must maintain a balance in order to avoid creating discordance.[100] The third criterion would need to be understood as the outcome being grounded on the drive towards innovation, because copyright law does not require intention to create.[101] The last criterion must be understood as a work that satisfies the Constitutional requirement to promote progress.[102] Using these criteria, we might be able to determine the originality of an AI-created work.

B.   WHAT KIND OF INVOLVEMENT BY A NATURAL PERSON IS SUFFICIENT SO THAT THE WORK QUALIFIES FOR COPYRIGHT PROTECTION?

The question asked by the USPTO posits a range of potential human involvement in AI creation in a series of sub-questions that might affect the copyrightability of the work.[103] Because of the wide range of potential human

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94.   Jan Zibner, *Artificial Intelligence: A Creative Player in the Game of Copyright*, 10 EUR. J.L. & TECH. 1 (2019).

95.   *Id.*

96.   *Id.*

97.   35 U.S.C. § 101 (2020) ("Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent . . . .").

98.   Zibner, *supra* note 94.

99.   Sam McNerney, *Embracing the Senses: Balancing Novelty and Habituation*, BIG THINK (Sept. 12, 2012), https://bigthink.com/insights-of-genius/embracing-the-senses-balancing-novelty-and-habituation [https://perma.cc/NKK5-AR5T]. Habituation is "the single force that has pushed art always in a consistent direction ever since the first work of art was made." *Id.* The artist's role is to counter habituation through innovation and changing art. *Id.* The reaction between a habituated audience and the innovative artist is what creates change in art. *Id.*

100.   *Creative Adversarial Networks for Art Generation with Ahmed Elgammal, supra* note 22, at 06:05.

101.   Zibner, *supra* note 94.

102.   *Id.*

103.   *See* Request for Comments on Intellectual Property Protection for Artificial Intelligence Innovation, 84 Fed. Reg. 58,141 (Oct. 30, 2019). The question published reads as follows:

involvement, it would be hard to generalize a single answer to the question, but following the breakdown of the sub-questions some generalizations might be possible.

Sub-questions i) and ii) ask about human involvement in the creation of or contribution to the algorithms or processes that lead to a work qualifying for copyright protection.[104] Processes and algorithms are not protectible by copyright law.[105] Because processes are unprotectable, it would stand to reason that the creation or contribution to a process would not result in authorship of a work created by that process. The underlying code of the algorithm may, however, be protectable by copyright if it is original.[106] Therefore, even if a human participated in the creation of the algorithm or process that produces the work, it is not likely that participation would be enough to generate copyright protection for the work.

Sub-questions iii) and iv) cover the possibility of a human choosing the data for the training set in the algorithm and the copyrightability of the resulting work.[107] The selection and arrangement of materials to create a new work may be protectable if it satisfies a modicum of creativity.[108] Therefore, a human who compiles data fed to an AI to create an new original work may have authorship of that creation[109] and in the compilation of the underlying data.[110] In The Next Rembrandt scenario,[111] the compilers of the art fed to the training set might have a copyright protection on the training set if they did some selecting and culling, more than merely collecting all of Rembrandt's paintings, to create the set. The human programming of the AI to create The Next Rembrandt may have copyright protection on the final product, absent work for hire or contractual issues, if the algorithm generates

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

Id.

104.   *Id.*

105.   17 U.S.C. § 102(b) (2020) ("In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery.").

106.   17 U.S.C. § 101 ("'Literary works' are works, other than audiovisual works, expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as books, periodicals, manuscripts, phonorecords, film, tapes, disks, or cards, in which they are embodied.").

107.   Request for Comments on Intellectual Property Protection for Artificial Intelligence Innovation, 84 Fed. Reg. 58,141 (Oct. 30, 2019).

108.   Feist Publ'ns, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 359–60 (1991) (setting the standard for originality in U.S. law requiring "a modicum of creativity" for copyright when the Court stated that protection would only be granted to "those components of a work that are original to the author").

109.   17 U.S.C. § 103.

110.   *Feist Publ'ns, Inc.*, 499 U.S. at 359–60.

111.   NEXT REMBRANDT, *supra* note 20.

something original. The human using the AI to create is akin to the human using a digital camera to make a new photograph. If the selection of elements leads to the creation of something original, the result would be copyrightable.

Sub-question v) asks about the possibility of protection for works created by any combination of the situations covered in the preceding sub-questions.[112] Depending on the involvement of human activity at each level of creation and use of an AI, each situation would have to be analyzed individually to determine the copyrightability of the resulting work. Each one of the possibilities would be very fact specific, *e.g.*, the level of customization put into the selection of the training set, the amount of original work created to go into the training set, or if any corrections or adjustments are made to the final work by a human, making the creation of an *ex-ante* legislative scheme almost impossible to achieve.

A human may make copyrightable contributions to an AI creation, and where this happens, copyright would reside in that human creating the work. If the work were a result of a work for hire situation and the copyrightable contributions sprung from that agreement, the copyright would reside with the employer.

C.   DOES THE EXISTING STATUTORY LANGUAGE AND RELATED CASE LAW
      ADEQUATELY ADDRESS THE LEGALITY OF AI MAKING USE OF OTHER
      PROTECTED WORKS?

The question of AI "ingesting large volumes of copyrighted materials" yields two distinct situations in the existing statutory scheme.[113] The first situation would include use of data to train the AI, thereby creating a better AI tool but where that training data is not part of the output of the program. For example, in facial recognition AI, the AI uses the tagged photographs in its training set to analyze unique facial structures and match that information to identify a person.[114] The result in this example is not an expressive work, but a task completed by the AI, i.e., the identification of a person. In this case, where the AI is performing a task and not creating expressive works, the current fair use doctrine can be employed to answer whether or not the infringement on the copyright of the works is acceptable.[115]

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112.   Request for Comments on Intellectual Property Protection for Artificial Intelligence Innovation, 84 Fed. Reg. 58,141 (Oct. 30, 2019).

113.   *See id.* at question 3.

114.   *The Complete Guide to Facial Recognition Technology*, PANDA SEC. (Oct. 11, 2019), https://www.pandasecurity.com/en/mediacenter/panda-security/facial-recognition-technology/ [https://perma.cc/943A-B2CK].

115.   17 U.S.C. § 107 (2020). Fair Use is a judicial doctrine codified by Congress. *Id.* The courts consider the four factors test found in section 107 to determine if a work avoids infringement through fair use. *Id.* The four factors are:

> (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes; (2) the nature of the copyrighted work; (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and (4) the effect of the use upon the potential market for or value of the copyrighted work.

Id.

The second situation would include scenarios like The Next Rembrandt Project, discussed above, where ingestion by the AI results in the creation of a new expressive work. The Next Rembrandt is not at issue because the AI ingestion was completely done with materials in the public domain.[116] In a scenario where the training set were to include works under copyright protection, however, the answer would not be clear cut. In keeping with The Next Rembrandt scenario, and assuming that Rembrandt's work was still under copyright, the resulting portrait might create a legal conundrum. The Next Rembrandt does not take any specific portions of any Rembrandt portrait but rather uses all of Rembrandt's portraits to create a new work.[117] However, in analyzing fair use factor three, this taking might be considered substantial and thus invalidating fair use.[118] The creation of derivatives by AI would take with it all the factual nuances of determining the legality of using protected works that apply to human creation of derivative works. To further complicate the issue, AI technology is in constant evolution, and we are not yet aware of all the modalities in which AI may eventually be able to ingest data.

D.   ARE CURRENT LAWS FOR ASSIGNING LIABILITY FOR COPYRIGHT INFRINGEMENT ADEQUATE TO ADDRESS A SITUATION IN WHICH AN AI PROCESS CREATES A WORK THAT INFRINGES ON A COPYRIGHTED WORK?

Although, in *Sony-Betamax*[119] and the cases following it, there exists a line of precedent addressing liability for copyright infringement that can be used as a set of guidelines, it is not completely clear whether that precedent is enough to cover the possibilities of AI creating an infringing work. Following the reasoning of *Sony-Betamax*, if an AI process infringes on a protected work, the programmer of that AI would be liable, but if the AI process does not infringe but could be used to infringe by a third party, the programmer of the AI may not be liable. At the present level of AI development, the case following *Sony-Betamax* may not be enough to clearly delineate when a creator of AI may be contributorily liable or vicariously liable.

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116.   NEXT REMBRANDT, *supra* note 20. The AI's training set in this project comprised all the works of Rembrandt Harmenszoon van Rijn from July 15, 1606 to October 4, 1669, none of which are under copyright protection. *Id.*

117.   *Id.*

118.   In some cases, courts have found use of an entire work to be fair use while in other contexts, using even a small amount of a copyrighted work would not be fair use because the selection used was an important part, or the "heart," of the work. *See e.g.,* Harper & Row, Publishers, Inc.. v. Nation Enters., 471 U.S. 539 (1985) (finding that taking 300 to 400 words *verbatim* from a 500-page book was not fair use because those 300 to 400 words were "essentially the heart of the book"); Campbell v. Acuff-Rose Music, Inc., 510 U.S. 569 (1994) (finding fair use because the infringing work, as a parody, needed to take the most of the lyrics, melody, and harmony of the protected song to make reference to it).

119.   *See generally* Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417 (1984). Wherein Universal Studios sued Sony, the maker of video cassette recorders, on the theory that Sony made the recorders available to the general public who in turn used the recorders to make unauthorized copies of copyright-protected television programs and movies broadcast by Universal. *Id.* The Court ruled that if the public sometimes violated copyright law by taping broadcast programs using Sony equipment, that violation did not make Sony liable for the infringement. *Id.* at 456.

E.   SHOULD AN ENTITY TO WHICH A NATURAL PERSON ASSIGNS A
      COPYRIGHTED WORK BE ABLE TO OWN THE COPYRIGHT ON THE AI WORK?

The works made for hire doctrine enables entities to be holders of the copyright on a protectable work.[120] Ownership of the resulting copyright in a work made for hire and its authorship goes to the firm, organization, or employer of the person making the work.[121] The work made for hire doctrine is the exception to the general rule in copyright granting the rights to the author.[122] The copyright on a work made for hire lasts for a period of "95 years from the date of publication or 120 years from the date of creation, whichever expires first" allowing for a termination of the rights for a right holder whose "life" cannot be measured as can that of a human author.[123]

The works made for hire doctrine seems to embody the answer that, without any modifications, the AI is the creator and the entity for whom the work is created is the right holder.[124] The work made for hire solution, however, only addresses the issue of ownership on a possible copyright but still leaves the issue of originality and authorship unanswered.

F.   ARE THERE OTHER COPYRIGHT ISSUES THAT NEED TO BE ADDRESSED TO
      PROMOTE THE GOALS OF COPYRIGHT LAW IN CONNECTION WITH THE USE
      OF AI?

This is a broad and openended question that reveals how much of copyright law would be affected by a recognition of AI as creators of protectable materials. For example, although registration is no longer a required formality to enjoy the protections associated with copyright,[125] it is a requirement to bring suit in a court of law.[126] To register a derivative, there

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120. *See generally* Bleistein v. Donaldson Lithographing Co., 188 U.S. 239 (1903) (establishing that the employer had the right to the work product of an employee). *See also* 17 U.S.C. § 101 (2020).

A "work made for hire" is (1) a work prepared by an employee within the scope of his or her employment; or (2) a work specially ordered or commissioned for use as a contribution to a collective work, as a part of a motion picture or other audiovisual work, as a translation, as a supplementary work, as a compilation, as an instructional text, as a test, as answer material for a test, or as an atlas, if the parties expressly agree in a written instrument signed by them that the work shall be considered a work made for hire.

Id.

121. 17 U.S.C. § 201(b). *See also* U.S. COPYRIGHT OFF., CIRCULAR 9: WORKS MADE FOR HIRE 2 (2012), https://www.copyright.gov/circs/circ09.pdf [https://perma.cc/4X4A-5Z3D].

122. Yanisky-Ravid, *supra* note 6, at 708–09.

123. 17 U.S.C. § 302.

124. Yanisky-Ravid, *supra* note 6, at 708–09.

125. 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."). *See also* U.S. COPYRIGHT OFF., CIRCULAR 1: COPYRIGHT BASICS 4 (2019), https://www.copyright.gov/circs/circ01.pdf [https://perma.cc/4QF9-6CK2]. Copyright exists automatically in an original work of authorship once it is fixed in a tangible medium. *Id.*

126. 17 U.S.C. § 411(a). "[N]o civil action for infringement of the copyright in any United States work shall be instituted until preregistration or registration of the copyright claim has been made in accordance with this title." *See also* Fourth Est. Pub. Benefit Corp. v. Wall-Street.com, LLC, 139 S. Ct. 881 (2019). Despite the vague statutory language concerning preregistration, in 2019 the Supreme Court affirmed that a registration, and not merely an application filed with the Copyright Office, is required to file a lawsuit alleging copyright infringement. *Id.*

is a requirement that the application include a listing of the works that underlie the new work.[127] If the training set for the AI is made up of protected works, how would the law differentiate whether the new work is a derivative of those works or if those works were used as a learning guide for the AI? While AI can be trained using only non-protected materials, *e.g.*, The Next Rembrandt, the large quantity of input data needed to create a working training set leads to the potential of ingestion of protected materials. That ingestion of protected materials could not only create issues of infringement but, at a more basic level, it would create registration complications.

III. DISCUSSION

Until recently, the ownership of AI-generated work has not been in question, as the AI has been a tool, like a camera, used to create, rather than a generator of original works.[128] AI technology is developing beyond the tool stage and continues to move forward through stages of autonomy that may lead, eventually, to independence of creation. Once AI can create independently, there will be economic and commercial repercussions to the protectability of those creations. If those AI creative works are not protected, they will fall into the public domain and that may slow down the incentive given to further develop AI systems.[129] A solution for protection of AI works will have to take into consideration the dual objectives of copyright law, which are incentivizing creativity while promoting dissemination.

To receive protection under copyright law, a work not only has to meet the requirements of fixation and originality, as mandated by section 102 of the Act, but it also must be the product of a human author.[130] The requirement for human production is supported by case law and the procedures of the USPTO.[131] In *Bleistein*, Justice Holmes interpreted the degree of originality needed for protection not only to be minimal but to have come from a human source.[132] It is fairly clear from the preceding discussion in this article that current law requires the work to be the result of a human's intellectual efforts. Once that work is fixed and has met the originality requirement, the author receives protection of the rights covered by

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127. U.S. COPYRIGHT OFF., CIRCULAR 14: COPYRIGHT IN DERIVATIVE WORKS AND COMPILATIONS 2 (2020) ("To register copyright claims in derivative works and compilations, information will be required regarding previous registrations of preexisting material, limitations of the claim, the material excluded, and a description of the new material added to the derivative work or compilation.").

128. Andres Guadamuz, *Artificial Intelligence and Copyright*, WORLD INTELL. PROP. ORG. MAG. (Oct. 2017), https://www.wipo.int/wipo_magazine/en/2017/05/article_0003.html [https://perma.cc/U5L5-NKET].

129. *Artificial Intelligence and Intellectual Property: An Interview with Francis Gurry*, WORLD INTELL. PROP. ORG. MAG. (Sept. 2018), https://www.wipo.int/wipo_magazine/en/2018/05/article_0001.html [https://perma.cc/89AU-GXC2].

130. 17 U.S.C. § 102(a) (2020).

131. *See generally* Naruto v. Slater, 888 F.3d 418 (2018). *See also* COMPENDIUM 3d., *supra* note 81, at §§ 306, 313.2.

132. *See* Bleistein v. Donaldson Lithographing Co., 188 U.S. 239, 251 (1903) (stating that the work is the "personal reaction of an individual upon nature" requiring "modest grade of art (that) has in it something irreducible, which is one man's alone").

copyright law.[133] The connection between the AI programmer and the end product of the AI process is far too attenuated to use the programmer as the human creator of the work.[134] If the AI programmer uses the AI as a tool to create, like a photographer uses a camera, and the link between the human programmer and the work is clear, there is no question that the work would be protected, if it was original, because of its human authorship.[135] Therefore, it is also fairly clear that applying the current statutory scheme and case law interpretation would result in a negative answer to the question of protecting works created by AI. Under the current law, a work produced by even a completely autonomous AI system would be too far removed from a human creator to be considered protectable. This focus on the necessity of a human creator is grounded on the pragmatic approach of U.S. law centering on the incentives of economic rewards.[136] The question of copyrightability for non-human-created works then must be answered in the negative under the current law. The more interesting question is, should we be ready to create a new legal scheme that allows for protection of those non-human-created works?

The General Director of World Intellectual Property Organization ("WIPO"), Francis Gurry, sees AI as "a new digital frontier that will have a profound impact on the world."[137] Originality may not be the best criterion to judge the protectability of AI generated works and a new "additional layer of IP" may be an answer to the question.[138] Another option is to treat AI-generated works as works for hire and assign the copyright to the entity considered the employer. We will examine both of those possibilities as a way to protect non-human-created works while keeping in mind the central issue of incentives.

A.   AI-GENERATED WORKS AS WORKS FOR HIRE

The work for hire doctrine may be used to solve the question of ownership.[139] The doctrine can be used as a way to pass ownership from the AI to a human author.[140] AI systems and their developers can be interpreted

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133.   17 U.S.C. § 106 ("[T]he owner of copyright under this title has the exclusive rights.").

134.   Begoña González Otero & João Pedro Quintais, *Before the Singularity: Copyright and the Challenges of Artificial Intelligence*, KLUWER COPYRIGHT BLOG (Sept. 25, 2018), http://copyrightblog.kluweriplaw.com/2018/09/25/singularity-copyright-challenges-artificial-intelligence/ [https://perma.cc/X6GT-7Y7P] ("AI itself cannot be considered to make such inherently human choices, and the link between it and the human programmer is not sufficiently strong to consider that the latter determines the final expression of the work.").

135.   Kalin Hristov, *Artificial Intelligence and the Copyright Dilemma*, 57 IDEA 431, 435 (2017) (citing Burrow-Giles Lithographic Co. v. Sarony, 111 U.S 53, 60 (1884)).

136.   Arthur R. Miller, *Copyright Protection for Computer Programs, Databases, and Computer-Generated Works: Is Anything New Since Contu?*, 106 HARV. L. REV. 977, 1066 (1993).

137.   Guadamuz, *supra* note 128.

138.   *Id.*

139.   Hristov, *supra* note 135, at 445.

140.   *Id.*

within the terms "employer" and "employee."[141] The term employee, currently defined as "a person usually below the executive level who is hired by another to perform a service especially for wages or salary and is under the other's control," can have a more flexible interpretation accommodating present limitations of AI generated works.[142] It is important to keep in mind that under the work made for hire doctrine an "employee" is defined under the general common law of agency.[143] A view of AI processes as employees of the users leads to a view where the users bear accountability for the systems' production and benefits.[144] This view also recognizes the human-like features of machine learning and AI creation, unlike the current legal model.[145]

Of course, utilizing a work made for hire model to grant copyright in AI created works would require changes in the current copyright law.[146] The basic issue remains the recognition of authorship outside of human creation. The current work made for hire framework requires a human to create but the doctrine creates a legal fiction where authorship is transferred from a human creator to the employer, who is either another human or a corporate entity.[147] The choice to call the employer an author "obviated some constitutional questions, and it elided some moral issues as well."[148] The current work made for hire doctrine recognizes that "it is the "employer's contribution as the "motivating factor" behind the work that matters, rather than the mere drudgery of the "employee."[149] In applying the doctrine, courts set their sights on the employer's contribution as the key, making the employer the author rather than giving the employer the right to control the work of the employee.[150] If this assertion is true and courts look to the employer's contribution, a change in the doctrine to allow for copyright of AI created content for the entity directing the AI would be logical. In The Next Rembrandt example,[151] ING would have copyright of the work

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141.   *Id.* at 445–46.

142.   *Id.* at 446.

143.   *See generally* Cmty. for Creative Non-Violence v. Reid, 490 U.S. 730 (1989) (holding unanimously that the plaintiff was not the author of the work because of the work for hire provisions of the Copyright Act, stating that (1) in order to determine whether a work is a work made for hire, a court should first ascertain, using principles of the general common law of agency, whether the work was prepared by an employee or by an independent contractor and, after making this determination, can then apply the appropriate subsection of 101; (2) under the above test and under the circumstances, the defendant was not an employee of the plaintiff but an independent contractor; (3) whether the work was a work for hire thus depended on whether the work satisfied 101(2) of the "work made for hire" definition; and (4) under the circumstances, the work did not satisfy 101(2)).

144.   Yanisky-Ravid, *supra* note 6, at 707.

145.   *Id.* at 716.

146.   *Id.* at 715.

147.   Catherine L. Fisk, *Authors at Work: The Origins of the Work-for-Hire Doctrine*, 15 YALE J.L. & HUMANS. 1, 4 (2003).

148.   *Id.* at 5.

149.   *Id.* at 6–7.

150.   Fisk, *supra* note 147, at 7.

151.   NEXT REMBRANDT, *supra* note 20.

generated by the project under an AI work made for hire theory because ING initiated the concept of the project.

B.   *SUI GENERIS* PROTECTION FOR AI WORKS

The United Kingdom ("U.K.") has led the way in granting authorship of AI generated works to human inventors.[152] The U.K. Copyright, Design and Patents Act ("CDPA") contains a definition for "computer generated works" ("CGWs") as the work is generated by computer in circumstances such that there is no human author of the work."[153] Although the CDPA does not refer to AI, the concept of "computer generated" seems to fit the description of an AI-generated work.[154] With the relationship of the definitions for works of machine intelligence in both U.S. and U.K. law, an analysis of the U.K. law may prove useful in the context of U.S. law.

Under the U.K. statutory scheme for CGWs, "ownership of the work belongs to the person who undertook the arrangements necessary for its creation, the term of protection is limited to 50 years, and no moral rights are recognized."[155] Furthermore, the CDPA recognizes authorship of a CGW as the person making the "arrangements necessary for the creation of the work."[156] Under this system, a human creating an AI that produces a protectable work would gain the copyright on that work for the statutorily defined period without gaining any moral rights. "By designating a human as the author of a work generated by an AI, the U.K. approach also separated authorship and creativity."[157] This scheme recognizes the AI as creator but the human as the legal author without contributing creativity to the work.[158]

Awarding authorship without creativity forms a deep philosophical problem within U.S. copyright law. As we have seen from the precedent found in U.S. jurisprudence, the two concepts of authorship and creativity are intertwined[159] and a separation of those concepts for AI-produced works would be met with resistance in the U.S. system. Also, as stated above, the U.K. statutory scheme applies directly to CGWs which are not a direct translation to AI-created works. The U.K. solution for CGWs provides a

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152.   *Artificial Intelligence Call for Views: Copyright and Related Rights*, U.K. INTELL. PROP. OFF. (Sept. 7, 2020), https://www.gov.uk/government/consultations/artificial-intelligence-and-intellectual-property-call-for-views/artificial-intelligence-call-for-views-copyright-and-related-rights [https://perma.cc/C5AW-RW8A] ("Unlike most other countries, the UK protects computer-generated works which do not have a human creator (s178 CDPA.).").

153.   Copyright, Designs and Patents Act 1988, c. 48, § 178 (Eng.).

154.   *Id.* Following the CDPA definition of "computer generated" as a work where "there is no human author" would mean that, under U.S. law, that work could not be original, lacking in human authorship, and fall within the category of works discussed in this article. *See id.*

155.   Otero & João Quintais, *supra* note 134, at 3.

156.   Copyright, Designs and Patents Act 1988, c 48, § 9(3) (Eng.) ("In the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken.").

157.   *Artificial Intelligence Call for Views, supra* note 152.

158.   *Id.*

159.   *See e.g.*, Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53 (1884); Bleistein v. Donaldson Lithographic Co., 188 U.S. 239 (1903).

conceptualized springboard to protection for AI works but it is not necessarily analogous.

There is no precedent in U.S. law for a *sui generis* legislative approach, but this solution, taking an example from the European Union's ("E.U.") database directive,[160] could provide a possible answer to protecting AI-generated works.[161] The E.U. database directive grants authorship to "the natural person who created the base or, where the legislation of the Member States so permits, the legal person designated as the rightholder by that legislation."[162] The creation of a *sui generis* approach to AI-generated works, outside of copyright law, could bypass the originality/authorship issues. By shifting from the authorship requirement to a broader system limiting protection of AI-generated works to something "akin to trademarks and realigning their protection to unfair competition" would allow for more flexibility and prevent the mass production of work that would create a reverse merger situation.[163] Dee offers a framework of eight points that a *sui generis* scheme must encompass[164] and, in addition to those points, a clear term of protection must be set out for AI-generated works.[165] That term of protection must keep pace with technology to ensure equilibrium in the market and a level playing field for human authors.

C.   INCENTIVIZING CREATIVITY

Copyright policy is grounded in a balancing act aiming at "maintaining an economic incentive for expression of valuable ideas, promoting scientific and literary development and preventing monopolization of the market for ideas and their derivative products."[166]

There is a general feeling that, beyond the incentives already given for the creation and design of AI processes, there is no need to incentivize AI creation:

> But we should not assume that we need copyright-like protection to stimulate the production of authorless outputs. Absent an author, the premise underlying incentive justifications requires substantiation. One must inquire whether these outputs in fact need the impetus of exclusive rights, or if sufficient incentives already exist, for example higher up the chain, through copyright or patent protection of the software programs,

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160.   Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the Legal Protection of Databases, 1996 O.J. (L 77) 27.3.

161.   Jani McCutcheon, *The Vanishing Author in Computer-Generated Works: A Critical Analysis of Recent Australian Case Law*, 36 MELB. U. L. REV. 915, 965 (2013). *See also* Celine Melanie A. Dee, *Examining Copyright Protection of AI-Generated Art*, 1 DELPHI 31, 36 (2018) (Ger.).

162.   Directive 96/9/EC, *supra* note 160, art. 4(1).

163.   Jani Ihalainen, *Computer Creativity: Artificial Intelligence and Copyright*, 13 J. INTELL. PROP. L. & PRAC. 724, 727 (2018).

164.   Dee, *supra* note 161.

165.   *See e.g.*, Directive 96/9/EC, *supra* note 160, art. 10. Article 10 of the Directive limits the term of protection for databases to "fifteen years from the first of January of the year following the date of completion." *Id.*

166.   Timothy L. Butler, *Can a Computer Be an Author? Copyright Aspects of Artificial Intelligence*, 4 HASTINGS COMMC'N & ENT. L.J. 707, 735.

patent protection of the specialized machinery to produce different kinds of outputs, and copyright protection of the database the software consults. Trade secrets and contracts may also play a role in securing the outputs.[167]

Computers are programmed by humans to perform tasks and need no incentives to create output.[168] AI may appear to create a protectable work but, at the current stage of technology, that creation requires a significant amount of input from humans.[169] AI will create without the incentive of copyright protection, but those who program AI to create may not be driven to innovate without protection.[170] If we accept that AI-created works satisfy the constitutional policy to advance progress, then the only other basis for rejecting the work is a literal interpretation of "author" as requiring a human creator.[171]

There is also a theory that the incentives provided by copyright protection are not necessarily a primary reason for why humans create.[172] Skepticism towards the incentives theory may help in finding a solution "without doing any damage to the incentives of authors to produce."[173] Some scholars have proposed that creative effort is driven by intrinsic factors, such as the desire to create, and extrinsic forces like monetary rewards.[174] Recognizing an exception to the incentives rationale for authorship would support the argument "for additional statutory exemptions from copyright to permit such publicly desirable activities as" the possibility of AI authorship.[175]

Despite the skepticism towards the incentives theory, protecting AI-created works may incentivize the development of AI beyond the present state of protection for processes and systems. Copyright or copyright-like protection for AI-created works could incentivize the development and dissemination of those works because the interests of investors and inventors would be guaranteed, giving them "a degree of legal security not otherwise available."[176] Without a system of protection, developers of AI would have no incentive to create or improve, limiting innovation and resulting in the diminution of creation.[177]

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167.   Ginsburg & Budiardjo, *supra* note 37, at 448.

168.   Miller, *supra* note 136, at 1066.

169.   *Id.* at 1066–67.

170.   *Id.* at 1066.

171.   *Id.*

172.   McCutcheon, *supra* note 161, at 952 (challenging the assumption that economic reward drives copyright creation).

173.   Diane Leenheer Zimmerman, *Copyrights as Incentives: Did We Just Imagine That?*, 12 THEORETICAL INQUIRIES L. 29, 55 (2011).

174.   *Id.* at 43.

175.   *Id.* at 55 (arguing in support of digital preservation projects digitizing protected works without the right holder's consent but it is equally valuable in support of AI authorship if we assume that creation to be desirable in that it could produce materials that would at some point fall to the public good giving a general benefit that would be analogous to that of digital preservation projects).

176.   Butler, *supra* note 166, at 735.

177.   Hristov, *supra* note 135, at 438–39.

CONCLUSION

While autonomous AI-generated work is not a reality at the present,[178] the continuing developments in AI technology will make it likely that they will become so in the near future. Works presently generated by AI have already risen to the potentiality of protection[179] despite the lack of autonomy or the legal caveat for human authorship. There is a market for AI-generated works and some of these works have been commercially successful.[180] However, all of these works will fall immediately in the public domain because works produced by non-humans will get no protection under the current law. While there is no legal requirement to protect these works, the idea of protection for them would incentivize creation, thereby promoting progress. The reasoning is that progress in the development of AI would be stymied by the lack of incentive because the work of the AI would bring no benefits to the developers.

The present copyright law regime should stay in place without change to protect human-created works, but a *sui generis* alternative, outside of copyright, would be a reasonable answer to the question. Allowing protection through a regime outside copyright bypasses the constitutional requirement for authorship and skirts the issue of incentives. While the idea incorporating a regime through the work for hire doctrine, creating the fictional notion of AI as an employee, offers another solution, it still leaves the human authorship question unanswered. The *sui generis* solution solves the drawbacks involved in fitting AI-created works into copyright while leaving that regime unaltered, avoiding potential issues and lack of predictability. The day has not dawned when AI has solely created an original work of authorship, but projects like The Next Rembrandt and progress in CANs have shown that the possibility cannot be far off. Copyright law could be flexible enough to adapt to that reality, but a tailored solution, leaving copyright for human-created works and this new regime for AI-created works, may be the best way forward.

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178.   *See generally* James Grimmelmann, *There's No Such Thing as a Computer-Authored Work—And It's a Good Thing, Too*, 39 COLUM. J.L. & ARTS 403 (2016).

179.   *See e.g.*, NEXT REMBRANDT, *supra* note 20. This article has focused primarily on The Next Rembrandt example, but that is not the only current AI generated work that could be protectable but for the lack of human authorship. A simple Google search for "AI art generator" or "AI music generator" will result in numerous hits for AI programs and sites offering AI created art.

180.   *See Is Artificial Intelligence Set to Become Art's Next Medium?*, CHRISTIE'S (Dec. 12, 2018), https://www.christies.com/features/A-collaboration-between-two-artists-one-human-one-a-machine-9332-1.aspx [https://perma.cc/2GBF-GH5J]. In October of 2018 Christie's offered for auction a work created by Obvious, a French art collective, using a GAN. *Id.* The work, Portrait of Edmond de Belamy, a vaguely impressionist faux 18th century portrait sold for $432,500. *Id.*