

ARTIFICIAL INTELLIGENCE AND THE COPYRIGHT DILEMMA

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ABSTRACT

Authorship of copyrightable works has been a hotly contested issue in the American legal system for over 200 years. With the recent boom of artificial intelligence, more and more creative works have been the result of non-human authors. Computer algorithms and learning machines have become a new source of creativity. The U.S. Copyright Office, however, has been slow to acknowledge the significance of AI in the creative process by denying copyrights of non-human works and releasing them into the public domain. This paper addresses the issue of IP ownership of AI generated works. It argues that giving authorship to AI programmers and owners is essential to the future development of the AI industry. The paper proposes that instead of redefining “authorship” to include non-humans, it is simply necessary to reinterpret the terms “employee” and “employer” in the made for hire doctrine of the U.S. Copyright Act. This reinterpretation would allow the current IP system to continue promoting “the progress of science and useful arts” without a lengthy or controversial overhaul of the rules and guidelines currently set in place.

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I. INTRODUCTION

A. *The Social Impact of AI*

Innovation has been a driver of human progress since the existence of mankind. Recognizing this, Article I of the U.S. Constitution states that “Congress shall have the power . . . to promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.”¹ Over the last two hundred years, a number of amendments have been made to the U.S. copyright law to accommodate for changes in societal norms. With the rapid growth in speed and capability of modern computers, artificial intelligence has secured a more prominent position as a driver of innovation. Little has been done, however, to accommodate for this fact.

Artificial intelligence has recently become a hot topic. Flashy news stories about self-driving cars, creative machines, and learning algorithms have made scholars, policy makers, and consumers more aware of both the benefits and need for AI. The recent popularization of AI has also made us aware of the fact that humans are no longer the only source of creative works. Computers with (and sometimes without) human assistance are also able to create artistic or innovative works.² These computers are

¹ U.S. CONST. art. I, § 8, cl. 8.

² Stephen Thaler, the President and CEO of Imagination Engines Inc., has been credited with the creation of computer programs which generate copyrightable material with and without human assistance. See Tina Hesman, *Stephen Thaler’s Computer Creativity Machine Simulates the Human Brain*, MINDFULLY.ORG (Jan. 24, 2004), <http://www.mindfully.org/Technology/2004/Creativity-Machine-Thaler24jan04.htm> (last visited Sept. 25, 2016).

occasionally called “creativity machines.”³ At times, they are programmed in such a way that they exhibit learned skills which their creators do not possess. Creative works produced as a result of these learned skills are a topic of debate, as they fall into a legal grey area.⁴

Creativity machines are just one type of AI. Their contribution to society, however, is significant, as they are able to generate new ideas through the use of software which mimics the configuration of human neural networks. These networks are comprised of a number of switches which can work together to assess information and create novel works which differ from prior art.⁵ This process is often both automatic and independent from human intervention. The results may vary significantly, and are often unique works of different levels of complexity and artistic value.⁶ As computers become faster and more capable, creativity machines and other forms of AI will likely take center stage in the creative process, becoming the main drivers of creativity and innovation.

³ Stephen Thaler, *Creativity Machine® Paradigm*, in *ENCYCLOPEDIA OF CREATIVITY, INVENTION, INNOVATION, AND ENTREPRENEURSHIP* 451 (Elias G. Carayannis ed., 2013).

⁴ The U.S. Copyright Act does not directly address the matter of works independently created by computer programs, thus leaving the subject open to interpretation by the courts, scholars, and the U.S. Copyright Office. For more information on autonomously machine generated works, see U.S. COPYRIGHT OFFICE, *COMPENDIUM OF U.S. COPYRIGHT OFFICE PRACTICES* § 313.2 (3rd ed. 2014).

⁵ Hesman, *supra* note 2.

⁶ Stephen Thaler, *Neural Networks That Autonomously Create and Discover*, IMAGINATION ENGINES, INC., http://www.imagination-engines.com/iei_pcai.php [<https://perma.cc/52TZ-GPNB>] (last visited Sep. 25, 2016).

B. AI as a Tool of the Human Author

This paper divides AI generated works into two main categories. The first category is represented by works generated by AI programs with the direct guidance, assistance or input of human beings. In this category, AI is used as a tool to achieve a determined or predicted goal or outcome. An example may be the creation of a painting by an artist who has selected the colors, tool type (brush size and stroke style) and has to some extent input his requirements into the AI algorithm used to create the work. Although the artist cannot exactly predict the final version of the generated painting, he has directly contributed to its creation and has some expectations as to what it may look like. Under U.S. copyright law, an author of such a work may have legal claims over the resulting creation if he cites the AI program as a tool or medium used in the creative process.⁷

The 1884 Supreme Court case of *Burrow-Giles Lithographic Co. v. Sarony* first extended copyright protection to photography.⁸ The camera used to capture the image of writer Oscar Wilde by photographer Napoleon Sarony was considered by the court as a tool which aided the “author” in creating “an original work of art.”⁹ Much has changed in the world of photography since the days of Sarony. Most cameras used today are fully digital and possess both a computer processor and software which makes photography a virtually automatic process. The 1884 Supreme Court ruling, however, is still used as a legal precedent justifying the issuance of copyright to millions of photographs taken each day. Since the image created by a

⁷ Cf. *Burrow-Giles Lithographic Co. v. Sarony*, 111 U.S. 53 (1884).

⁸ *Id.* at 60

⁹ *Id.* Legal protection for all photographs was eventually made a part of the U.S. Copyright Act. 17 U.S.C. § 106A (2012).

digital camera or smart phone is actually computer-generated, it may very well be compared to the creation of an art work using an AI program. Both processes are nearly automatic and it could be argued that an AI machine, just like a camera, is simply a tool employed by an author to express his or her idea in a tangible form.¹⁰

C. *AI as an Independent Actor in the Creative Process*

The second category of works, which this paper focuses on in detail, deals with autonomously generated AI creations. The computer programs responsible for autonomously generating works are the result of human ingenuity, their source code may be copyrighted as a literary work under the U.S. Copyright Act.¹¹ The artworks generated by such programs, however, are not copyrightable if not directly influenced by human authors.¹² One example given by the U.S. Copyright Office is a “weaving process that randomly produces irregular shapes in the fabric without any discernible pattern.”¹³ Since chance, rather than the programmer of this “weaving machine”, is directly responsible for its work, the resulting patterns would not be protected by U.S. copyright. Randomness, just like autonomously learned behavior is something that cannot be attributed to the human programmer of an AI machine. As

¹⁰ 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.”

¹¹ Computer Software Copyright Act, Pub. L. No. 96-517, § 117, 94 Stat. 3028 (1980) (codified at 17 U.S.C. § 117 (1988)).

¹² U.S. COPYRIGHT OFFICE, *supra* note 4, § 306

¹³ *Id.* § 313.2.

such, the resulting autonomous works are not eligible for copyright protection and fall directly into the public domain.

II. THE ISSUE OF AI AUTHORSHIP

A. *Current Stance of the U.S. Copyright Office*

Although the term “writings” is open to interpretation within U.S. copyright law, a great number of AI generated works often fall outside its scope by failing to satisfy all of its requirements.¹⁴ The latest version of the Compendium of best practices published by the U.S. Copyright Office also poses a challenge to the registration of autonomously generated AI works. In fact, creative works generated solely by AI machines are not copyrightable if they do not satisfy the human author requirement of the Copyright Office.¹⁵ In other words, unless AI generated works can directly be attributed to a human author, they would theoretically not be copyrightable and would fall into the public domain upon their creation.

As the copyright requirements listed by the U.S. Copyright Office in the latest version of its Compendium state, “[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.”¹⁶ This makes works created by AI machines, for which the human author of the machine is not directly responsible, fall into the public domain. As AI

¹⁴ The term “‘Writings’ . . . have not been construed in [its] narrow literal sense but, rather, with the reach necessary to reflect the broad scope of constitutional principles.” *Goldstein v. California*, 412 U.S. 546, 561 (1973).

¹⁵ U.S. COPYRIGHT OFFICE, *supra* note 4, § 306.

¹⁶ *Id.* § 313.2.

programs become more sophisticated, less human intervention would be required, resulting in an increasingly autonomous creative process and a growing number of works without any form of copyright protection. This issue would only be magnified by the future development and expansion of AI.

B. Disadvantages of the Current Stance

There is a considerable disadvantage to the release of independently generated AI creative works into the public domain. Without an established period of protection, there is no tangible incentive for developers of AI machines to continue creating, using, and improving their capabilities. Simply put, even if programmers and the companies for which they work have invested a substantial amount of time and money into the creation of AI machines, for the most part, they would not be able to enjoy copyright protection or the financial benefits associated with it. This trend could ultimately limit innovation by dissuading developers and companies from investing in AI research, resulting not only in the decline of AI but also in the decline of innovation across a number of related sectors.

In the 1984 case of *Sony Corp. of Am. v. Universal Studios, Inc.* the Supreme Court ruled that the limited benefits associated with copyright ownership are “intended to motivate the creative activity of authors and inventors by the provision of a special reward, and allow the public access to the products of their genius after the limited period of exclusive control has expired.”¹⁷ Copyrighted works not only serve as an incentive to creativity, but also increase the number of works available in the public domain after their copyright expiration.

¹⁷ *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 429 (1984).

Denying copyright from being issued to developers and owners of AI machines reduces their incentives to create new AI programs, and may ultimately lead to a lower number of AI generated copyrightable works and (after expiration of their copyrights) a considerable decrease in works entering the public domain. As a result, it becomes apparent that immediately releasing AI works into the public domain, as opposed to doing so after a certain period of copyright protection, significantly decreases incentives for creativity and is counterproductive to the development of AI.

Less available, AI generated copyright protected works would also mean less material available for use in teaching, scholarship and research under the Copyright Act's fair-use doctrine. The doctrine allows the use of copyrighted material for non-commercial educational purposes.¹⁸ A decreased number of AI generated works would potentially have far reaching negative effects in numerous sectors where the impact of AI research is proving very beneficial. The arts, education, medicine, technology, among others, could suffer significantly, resulting in loss of valuable research and future AI applications.

III. METHODOLOGY

Both an analytical and deductive approach have been employed in determining the most effective solution to the above mentioned issue. A number of scholarly and legal texts relating to the matter of AI copyright have been scrutinized and used to support the authors point. The U.S. Copyright Act; legal cases which have set copyright law precedent; and published articles on non-human creativity and innovation have been analyzed, and a number of solutions and recommendations have been formulated as a result.

¹⁸ 17 U.S.C. § 107.

The author's focus falls primarily on U.S. copyright law as formulated in the Copyright Act of 1976 and its subsequent amendments. The Act was written and implemented at a time when AI generated works were still uncommon and the capability of computers was still in its infancy. The most recent representation of copyright law is used in order to reflect the current issues facing U.S. copyright policy and emphasize the need for a contemporary solution by Congress. In addition, the made for hire doctrine of U.S. copyright law is closely examined. After in-depth analysis, the author of this paper deduces that a reinterpretation of the terms "employee" and "employer" in the made for hire doctrine is the least disruptive and most practical solution to the issue of AI generated works falling into the public domain.

The use of current copyright law, legal copyright precedents, and scholarly articles pertaining to the issue, serve as a method which helps the author formulate a much needed solution to a growing problem in the AI sector. By examining scholarly articles it is possible to understand the scope of the issue. Legal cases and the precedents they set, allow us to weigh the positive and negative effects of any future changes in U.S. Copyright Act. Finally, close analysis of current copyright law emphasizes the limited nature of copyright protection offered to AI generated works, an issue which reflects the outdated nature of the U.S. Copyright Act of 1976.

IV. FINDINGS

A. *Non-humans as Authors*

Since only the authors of creative works may enjoy legal protection,¹⁹ some scholars have argued that the term

¹⁹ *Id.* § 201(a)

“authorship” should be redefined to include both human and non-human authors.²⁰ Professor Ryan Abbott is one such strong proponent of legal rights for non-human authors and inventors. In a recently published paper he argues that assigning inventorship and authorship to non-humans is an innovative new way to encourage AI growth and development.²¹ In theory, this could prevent works independently created by AI machines from falling into the public domain and offer the programmers and companies behind these machines some exclusivity to the resulting copyrightable works. This theoretical solution, however, is controversial and could lead to an uncertain future full of legal challenges and systemic abuse.

Non-humans are not natural persons and may not be held legally responsible in a court of law.²² As such, they may not be considered authors according to guidelines set by the U.S. Copyright Office.²³ Redefining copyright authorship to include non-human authors would undermine the current U.S. legal system, creating further uncertainty by raising more questions than answers. As a result, an

²⁰ Colin R. Davies and Ryan Abbot have (independently) both argued that computers should be considered legal authors/inventors under relevant IP law. See Ryan Abbott, *I Think, Therefore I Invent: Creative Computers and the Future of Patent Law*, 57 B.C. L. REV. 1079 (2016); Colin R. Davis, *An Evolutionary Step in Intellectual Property Rights—Artificial Intelligence and Intellectual Property*, 27 COMPUTER L. & SECURITY REV. 601 (2011).

²¹ Abbott, *supra* note 20, at 1098–99.

²² The legal rights and responsibilities of non-human animals were issues ruled on in both *People v. Frazier*; and *Naruto v. Slater*. In both instances, the non-humans involved were deemed to have no legal standing in front of the law, thus being absolved of all legal rights and responsibilities within each case. *Naruto v. Slater*, 2016 U.S. Dist. Lexis 11041 (N. D. Cal. Jan. 23, 2016); *People v. Frazier*, 173 Cal. App. 4th 613 (2009).

²³ U.S. COPYRIGHT OFFICE, *supra* note 4, § 306.

effective solution would require that both the legal status of a copyright holder and the need for incentives for AI developers are considered. These two important conditions are necessary in order to ensure the legal standing and future development of the AI sector.

B. Human Authorship Solution

The notion of assigning authorship of computer generated works to humans can be traced back to U.K. Copyright Code.²⁴ Professor Annemarie Bridy echoes the United Kingdom’s position by suggesting the use of an amendment to the made for hire doctrine of the U.S. Copyright Act as a way to transfer copyright to a human author.²⁵ An amendment of the Copyright Act, however, must diverge from the current agency law approach used to categorize the relationship between an employee and employer, set as precedent by the Supreme Court’s decision in *Community for Creative Non-Violence v. Reid*.²⁶ Employing a relative interpretation of terms “employee” and “employer” within the made for hire doctrine, as opposed to rigidly defining them in accordance with agency law, is one of the most effective ways to allow transfer of AI generated works to human authors.

²⁴ The copyright of computer generated works in the U.K. is attributed to “the person by whom the arrangements necessary for the creation of the work are undertaken,” similar to the employer in the U.S. Copyright Act’s made for hire doctrine, who is prescribed authorship under relevant copyright law. Copyright, Designs and Patents Act, 1988, c. 48, § 9(3) (U.K.).

²⁵ See generally Annemarie Bridy, *Coding Creativity: Copyright and the Artificially Intelligent Author*, 2012 STAN. TECH. L. REV. 5, ¶¶ 66–67 (2012).

²⁶ *Cnty. for Creative Non-Violence v. Reid*, 490 U.S. 730, 739–40 (1989). Based on the Supreme Court’s ruling, the term “employee” in 17 U.S.C. § 101 must be viewed in accordance with agency law. *Id.*

The *works made for hire* doctrine defines two types of copyrightable creations. The first is “a work prepared by an employee during the scope of his or her employment.”²⁷ The second, “a work specifically 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.”²⁸ In both examples copyright is awarded to a party which was not originally responsible for the creation of the work. The focus of this paper only falls on the first example of employee generated works. This paper argues that both “employer” and “employee” should be viewed as relative terms within the scope of the made for hire doctrine. This open interpretation would prevent AI generated works from falling into the public domain by assigning their copyright to a human author.

C. *Human Authors: Programmers; Owners; End Users*

There are three possible parties which may have claims to the copyright of AI generated works: AI programmers; owners (large companies and financial investors in the AI sector); and end users. When determining the best possible author, it is necessary to consider the overall social benefit of the copyright attribution process. In other words, would society benefit most if copyright is assigned to the AI programmer, the institution responsible for funding the development of the AI, or the potentially millions of end users of AI programs. To better gauge the societal impact of each party, we must first determine the ultimate goal of assigning copyright of AI generated works to human authors. Next, we can assess which party contributes most to this goal. Finally, we may deduce that

²⁷ 17 U.S.C. § 101.

²⁸ *Id.*

the party which contributes most to the realization of this goal is best suited to possess authorship of AI generated works.

1. The Goal of Human Authorship

Providing financial incentives in order to encourage the growth and development of the AI industry and ensure the dissemination of AI generated works is arguably the ultimate goal of assigning copyright to human authors. The very idea of offering a temporary monopoly over new works in order to promote innovation and creativity is enshrined in the U.S. Constitution.²⁹ As a result, American society has been able to sustain its creative and innovative spirit for over two centuries. Financial incentives should, therefore, be reserved for the greatest contributors to the development and dissemination of AI.

AI machines, unlike human developers, have no need for financial incentives. Their performance is not dependent on tangible rewards but rather on the investment of time and skills by AI programmers and the financial backing of the companies for which they work. These two entities are the most important contributors to the research and development of the AI sector. Without their contribution, AI devices would simply not be available for use by the general public.

2. End Users and Authorship

Since end users have the smallest contribution to the initial development of AI, their claims for authorship are least compelling. In fact, assigning authorship to end users instead of AI developers could be detrimental to the growth of the AI sector. By losing copyright claims to end users, owners and programmers may restrict the use of AI by third parties. These protective measures would allow developers to maintain copyright over the works generated by AI but would also limit the applications of AI and the numerous

²⁹ U.S. CONST. art. I, § 8, cl. 8.

benefits associated with them. As a result, society would likely see a significant decline in AI generated works and a decline in the overall development of the AI industry.

3. How to Incentivize the Contribution of Developers

Providing incentives to AI programmers and owners would be the logical solution to ensuring sustainable growth and development of the AI sector. While independent programmers may retain copyright for the work generated by their AI, copyright of AI works created within large companies may be settled through employment contracts and attributed to either programmers or the companies for which they work (based on the contractual agreement). Should owners and programmers choose to assign copyright to end users, this may be done through End User Licensing Agreements (EULA). In the long term, licensing may prove more financially viable for some companies, while commercializing AI generated works may work best for others.

D. Reinterpreting the Made for Hire Doctrine's Employer and Employee

As previously stated, it is necessary to allow AI generated works to be copyrighted by either the author or owner of the AI program. Since the authors and owners are not always directly responsible for these AI generated works, this is not possible under current U.S. copyright practice.³⁰ A feasible solution may be found in the made for hire doctrine of the U.S. Copyright Act.³¹ According to the doctrine, “(if) a work is made for hire, an employer is considered the author even if an employee actually created the work. The employer can be a firm, an organization, or

³⁰ See U.S. COPYRIGHT OFFICE, *supra* note 4 at § 306.

³¹ Bridy, *supra* note 25, ¶¶ 63–69.

an individual.”³² These guidelines on issuing authorship to a party that did not directly create a copyrightable work could be applied to the AI industry.

The employee–employer relationship in the made for hire doctrine may be applied to AI programs and their developers if the terms “employer” and “employee” are interpreted as relative within the confines of the doctrine. Just as the term “author” may be applied to various entities (an individual, a firm or organization), and the term “writings” is an all-encompassing word that could mean books, sound recordings, films, images, and even computer code, so too should employer and employee be left open to interpretation in order to satisfy newly arising requirements and reflect contemporary social changes.³³ Although the current legal definition of employee may be constrained to “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,” a more flexible definition could also be used to accommodate the existing legal limitations of AI generated works.³⁴

A relative interpretation would mean that an “employer” may be considered as someone who employs the services of another entity in order to achieve a goal or complete a task. A programmer or owner of an AI machine would satisfy this definition as he or she employs the services of the AI device in order to generate new creative

³² U.S. Copyright Office, *Circular 9: Works Made for Hire* (Sep. 2012), <https://www.copyright.gov/circs/circ09.pdf> [<https://perma.cc/V86P-SA8A>].

³³ The terms “author” and “writings” have long been understood to have flexible interpretations under the scope of relevant copyright law. See *Goldstein v. California*, 412 U.S. 546 (1973).

³⁴ *Employee*, *MERRIAM-WEBSTER ONLINE*, <http://www.merriam-webster.com/dictionary/employee#legalDictionary> [<https://perma.cc/M4N2-LH6J>] (last visited July 22, 2016).

works. Furthermore, if a relative interpretation is used, an AI machine could be considered an employee since its generative services are employed by its programmer or owner. This new interpretation of two of the terms (employer and employee) in the made for hire doctrine could prove essential for the future development of AI by providing the incentive of copyright protection to innovative AI developers.

The employee–employer relationship, as interpreted in relative terms to allow the passage of authorship from the AI machine to its developer, would effectively solve the current issue of AI generated works falling into the public domain. Although authorship belongs to the original creator of the work, in this case the AI device, the made for hire doctrine would allow the developer or owner of the AI to be “considered the author for the purpose of the title.”³⁵ In essence under the provisions of the made for hire doctrine, the employer is not the actual author of the work, but is only considered as such to satisfy requirements of the law.

V. SIGNIFICANCE

A. *The Legal/Natural Person Dilemma*

By reinterpreting the employee–employer relationship of the made for hire doctrine a number of issues are avoided. Firstly, copyrights are attributed to a legal/natural person instead of a non-human with no legal protection. Human programmers and companies who own AI machines are considered natural and legal persons, respectively.³⁶ As such, they are fully responsible under the law and enjoy all privileges and liabilities associated with it.

³⁵ 17 U.S.C. § 201(b).

³⁶ Elvia Arcelia Quintana Adriano, *The Natural Person, Legal Entity or Juridical Person and Juridical Personality*, 4 PENN. ST. J. L. & INT'L AFF. 363, 366 (2015).

This is essential when awarding copyrights or if any future legal challenges associated with ownership of the works in question should arise.

This issue is clearly illustrated in the case *Naruto v. Slater*.³⁷ In 2011 the British wildlife photographer David Slater traveled to Indonesia to take photographs of the local macaques.³⁸ During one of his shoots, Slater placed his camera on a tripod, adjusted the camera's settings to accommodate for the surrounding environment and left the remote shutter button deliberately accessible to the macaques he was photographing.³⁹ A female macaque seized the opportunity and took a number of photos.⁴⁰ Although only a handful of the resulting photographs were actually usable, the “monkey selfies,” as they came to be known, proved widely popular around the world.⁴¹ Upon returning home, Slater began licensing the photos under the presumption that he owned their copyright.⁴² His legal claims over the photos were soon challenged in U.S. court. People for the Ethical Treatment of Animals (PETA) argued that the female macaque who had taken her own photographs should be the legal owner of their copyright.⁴³

³⁷ *Naruto v. Slater*, 2016 U.S. Dist. Lexis 11041 at *1 (N. D. Cal. Jan. 23, 2016).

³⁸ *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/2SWX-WWMM>] (last visited Sept. 25, 2016).

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² *Id.*

⁴³ *'Monkey Selfie' Case Headed to U.S. Court of Appeals*, PETA (Aug. 2, 2016), <http://www.peta.org/blog/monkey-selfie-case-headed-u-s->

In January 2016 the judge presiding over *Naruto v. Slater* dismissed the case stating that the monkey (identified by PETA by the name Naruto) could not be considered an author for the purpose of the law and as a result may not possess any copyright even though the animal was directly responsible for the creative works in question.⁴⁴ The judge further clarified that since an animal (non-human) does not have legal standing in court, it may not sue or pursue copyright using the law.⁴⁵ The court's ruling effectively released the photographs in question into the public domain, denying any claims of authorship by either David Slater or the female macaque.

B. The Human Author Requirement

In addition, the latest publication of the Compendium of best practices by the U.S. Copyright Office clearly states that copyrights will only be granted to human authors.⁴⁶ Since animals and machines are not considered humans they do not satisfy this requirement. Under the work made for hire doctrine, however, authorship would not be awarded to the non-human creator of the work but, rather, to its human employer, effectively satisfying the human requirement of the U.S. Copyright Office. The proposed reinterpretation of the made for hire doctrine would ensure that the copyright of all AI generated works is attributed to a human author, eliminating the need for a lengthy debate over the legality and practicality of non-human authorship.

court-appeals/ [<https://perma.cc/Y6ZD-W236>] (last visited Sept. 25, 2016).

⁴⁴ *Naruto v. Slater*, 2016 U.S. Dist. Lexis 11041 at *3 (N. D. Cal. Jan. 23, 2016).

⁴⁵ *Id.*

⁴⁶ U.S. COPYRIGHT OFFICE, *supra* note 4, § 306.

C. *Proper Disclosure*

Another problem avoided by issuing copyright to humans through a reinterpretation of the terms “employee” and “employer” in the made for hire doctrine is the failure to disclose AI participation in the creative process. Since a cloud of uncertainty currently hangs over the registration of AI generated works, developers of AI programs are often reluctant to file for copyright, fearing that the process may ultimately result in rejection by the U.S. Copyright Office. In some cases, this reluctance may even result in knowingly withholding information about the contribution of AI in the creative process. Failing to attribute the creation of a work to its rightful author has serious consequences and could potentially invalidate a copyright claim.⁴⁷ Allowing the transfer of copyright to a human employer effectively resolves the above issue and ensures that AI generated works are not only registered lawfully, but also properly documented.

D. *Term of Copyright Protection*

Finally, unlike human authors who have a limited lifespan, AI programs could perpetually exist. This challenges the predetermined term of copyright protection given to authors (life of author plus 70 years in the U.S.).⁴⁸ A reinterpretation of the employee–employer relationship in the made for hire doctrine to allow transfer of copyright from AI to its employer effectively resolves this issue since the doctrine’s provisions state that “(the) term of copyright protection of a work made for hire is 95 years from the date of publication or 120 years from the date of creation,

⁴⁷ 17 U.S.C. § 411(a).

⁴⁸ *Id.* § 302(a).

whichever expires first.”⁴⁹ Both the date of publication and the date of creation may easily be determined unlike the actual lifespan of an AI program.

VI. RECOMMENDATIONS

A. PREVIOUS RECOMMENDATIONS

The 1974 formation of the Commission of New Technological Uses of Copyrighted Works (CONTU) by Congress was a response to new emerging technologies and the rapid growth of private computer use in the U.S.⁵⁰ The Commission, tasked with researching and formulating recommendations for Congress on copyright in the computer age, declared in its 1978 report that computers were simply tools whose main function was to assist human authors in the creative process.⁵¹ In addition, the report also stated that independently generated computer works required no particular consideration since autonomous works were not deemed possible in the foreseeable future.⁵² In light of technological advancements over the last three decades and the rapid growth of AI, a reassessment of the recommendations issued in CONTU’s 1978 report is long overdue.

⁴⁹ *Id.* § 302. For a complete explanation of copyright terms related to works under the works made for hire doctrine of 17 U.S.C., see U.S. COPYRIGHT OFFICE, *Circular 15A: Duration of Copyright* (Aug. 2011), <https://www.copyright.gov/circs/circ15a.pdf> [<https://perma.cc/3BU5-DGAK>].

⁵⁰ NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, *Final Report on New Technological Uses of Copyrighted Works* 1–21 (1978), <http://eric.ed.gov/PDFS/ED160122.pdf> [<https://perma.cc/WEE2-746L>].

⁵¹ *Id.* at 110. The Commission further provides a number of examples of how computer programs may simplify or shorten the creative process but not be solely responsible for it.

⁵² *Id.* at 109.

B. Author’s Recommendations

The U.S. Copyright Act has gone through a number of revisions over the years. Each new addition to the U.S. Copyright Act reflects a fundamental change in the way American society perceives the creative process and the tools deemed necessary to reinforce it. No changes, however, have been exercised to reflect the most recent technological phenomenon of machine learning, commonly referred to as artificial intelligence. The following segment of this paper summarizes the necessary steps needed to bring the U.S. Copyright Act to modernity by directly addressing the issue of AI generated works and their copyright eligibility.

In order to promote future development of the AI industry and ensure dissemination and application of AI generated works Congress needs to take the following steps:

- 1) Acknowledge that as a result of recent enhanced computer capabilities, humans are no longer the only source of innovative and creative works.
- 2) Recognize the need for incentives (under the form of copyright protection) needed by programmers and AI owners in order to stimulate future development and investment in the AI field.
- 3) Do not redefine “authorship” by including non-humans or non-legal persons. This would open a Pandora’s Box of complications and future legal challenges.
- 4) Allow a relative interpretation of the terms “employer” and “employee” in the made for hire doctrine of the U.S. Copyright Act. By accepting employer and employee as relative terms open to interpretation (just like the term “author” in the U.S. Copyright Act) the doctrine may be used to transfer authorship from the original creator (the AI machine), to its employer (the programmer or owner of the device).
- 5) Any new legislation enacted by congress should be periodically reviewed and amended in light of new and emerging technological advances. The copyright

of AI generated works will undoubtedly need to be reassessed in the not too distant future as machine learning becomes more sophisticated and AI devices become more capable and autonomous.

VII. CONCLUSION

The recent development of machine learning capabilities has resulted in an increased number of AI generated works and an understanding that humans are no longer the only source of creativity or innovation. The outdated nature of the current U.S. Copyright Act, however, fails to reflect this contemporary reality, resulting in the release of a great number of AI generated works into the public domain. This trend does not benefit the programmers and owners of AI devices and limits their willingness to invest resources in the future development of AI.

The consequences of this gap in copyright law are far reaching and may result in a decrease of valuable new works available to scholars, researchers, and consumers, and a significant delay in technological and artistic progress of modern society. As significant as this issue may be, it has yet to be effectively addressed and a need for a practical solution still exists. This solution should be both motivational to AI developers and non-disruptive to the current legal system. Satisfying these requirements would ensure the smooth development of AI and secure its long-term role as a driver of creativity and innovation.

The proposed reinterpretation of the terms “employee” and “employer” in the made for hire doctrine is an effective and practical way to address the above mentioned shortcoming of the U.S. Copyright Act. Under a new interpretation of the terms in the made for hire doctrine, authorship of AI generated works would be awarded to the programmers and owners of AI devices. This legal incentive would financially benefit those responsible for AI development, resulting in a significant boost in research and

investment in the AI sector and the modernization of a rapidly aging U.S. Copyright Act.