Can AI Find its Place Within the Broad Ambit of Copyright Law?

Tal Dadia, Chuan Lee, Tan Hui Xin, Harseerat Kaur & Dov Greenbaum †

I. INTRODUCTION

In 2016, filmmaker Oscar Sharp collaborated with Ross Goodwin to build an artificial intelligence (AI) machine that writes screenplays. The two fed the machine, named Benjamin, with hundreds of scripts. This effort resulted in many machine-made film scripts;[1] the most famous, Sunspring, became a short scene

DOI: HTTPS://DOI.ORG/10.15779/Z382V2CB2T.

† Contributing Authors: Tal Dadia, The Interdisciplinary Center, Herzliya; Chuan Lee & Tan Hui Xin, Singapore Management University; Harseerat Kaur, NALSAR University of Law; & Dov Greenbaum, The Interdisciplinary Center, Herzliya, Yale University.

1. *Sunspring: A Sci-Fi Short Film Starring Thomas Middleditch*, THEREFOREFILMS (2016), http://www.thereforefilms.com/films-by-benjamin-the-ai.html [https://perma.cc/4LVE-2C3T].

acted out by Thomas Middleditch and others.[2] That novel, nine-minute film, was filled with intense emotions and seemed to be generally well-received, although it was nearly impossible to understand.[3]

Benjamin is a recurrent neural network, a methodology within the umbrella of AI technologies that can be used to classify text.[4] Goodwin claimed that the AI program captured the natural rhythm and voice of science fiction writing from the dataset selected and provided by its creators. Thus, the AI-created works seemed more human-like than their predecessors, perhaps even a hybrid amalgamation of the voices of many diverse science fiction writers.

In general, the work product of an AI like Benjamin's might be described along a spectrum of creativity from partially generative to fully generative. Further, while the output thereof could also be described along a spectrum— ranging from a tool or simple regurgitator on one end to a co-authoring non-human writer on the other— in developing the scene, Goodwin himself claimed that Benjamin was only an instrument within the creative process, not necessarily an independent creator, or even a co-creator, in of itself.

A. Creative AI in Hollywood

Benjamin isn't the only AI out there that can compose arguably creative works.[5] There are many other examples of AI in the creation of art.[6] For instance, Google's Deep Dream program[7] allows for a computer vision program to use human-made art to generate new AI-developed art. Other AIs are even good enough to be financially successful, such as Endel. Endel produced an AI algorithm that Warner Music signed in March 2019.[8]

While the media often portrays AI-created projects as scientific breakthroughs, many commentators have simply categorized AI-created art as derivatives of man-made art, lacking that intangible quality that is arguably

2. Ars Technica, *Sunspring | A Sci-Fi Short Film Starring Thomas Middleditch*. YOUTUBE (Jun. 9, 2016), www.youtube.com/watch?time_continue=99&v=LY7x2Ihqjmc [https://perma.cc/ZE6V-L9EU].

3. Annalee Newitz, *Movie Written by Algorithm Turns Out to be Hilarious and Intense* (June 9, 2016), https://arstechnica.com/gaming/2016/06/an-ai-wrote-this-movie-and-its-strangely-moving/ [https://perma.cc/B3YT-3WDV].

4. Afshine Amidi and Shervine Amidi, *Recurrent Neural Network Cheatsheet,*https://stanford.edu/~shervine/teaching/cs-230/cheatsheet-recurrent-neural-networks [https://perma.cc/L39F-JCS3].

5. Giuseppe Amato, et al. *AI in the Media and Creative Industries*. *arXiv preprint arXiv:1905.04175,* NEW EUROPEAN MEDIA (Apr. 2019).

6. Bob L.T. Strum, Maria Iglesias, Oded Ben-Tal, Marius Miron, and Emilia Gómez, *Artificial Intelligence and Music: Open Questions of Copyright Law and Engineering Praxis,* 8 ARTS 115 (2019).

7. *Human AI*, *Deep Dream Generator*, https://deepdreamgenerator.com/ [https://perma.cc/UK7M-Z5AP].

8. Amy Wang, *Warner Music Group Signs an Algorithm to a Record Deal*, ROLLING STONE (Mar. 23, 2019),https://www.rollingstone.com/music/music-news/warner-music-group-endel-algorithm-record-deal-811327/ [https://perma.cc/AZ3K-W83C].

inherent to human art.[9] Detractors further claim that current AI technology is purely mathematical and calculating and that it cannot create true art.[10] Some of those wary of AIs foray into art even claim that any creative work created by current AI technology is simply a hollow reflection of earlier human artists, transferring their style, but not their soul.[11] Finally, some have noted that even when AI art produces something seemingly novel, exciting or eccentric, it still ultimately fails to incorporate that *je ne sais quoi* of man-made art.[12]

Notably, AI is not confined to the creative side of filmmaking. Recently, Warner Brothers, the Burbank, California-based entertainment giant, announced a deal with AI film management start-up Cinelytic, intending it to help with the less glamorous aspects of film production.[13] Cinelytic uses AI to provide relevant movie ideas for future films. It offers insights for the optimization of content for best box office returns, as well as working with film studios to determine the best practices for financing, producing, and distributing new films. Still, other AI machines crunch data from various sources to suggest optimal talent for films or brands that said talent might successfully hock.[14] In their article, Hunter et al describes how AI can even be used to see how a screenplay can be a good prediction of the film's success in the box office during the first weekend of its distribution.[15]

However, AI has the potential to be involved in more than just the number-crunching aspects of film development. At the 2020 Consumer Electronics Show (CES) in Las Vegas, Samsung's STAR Labs showed off its vision of artificial humans.[16] Dubbed Neons, Samsung's life-size video avatars employ AI to look,

---

9. Ken Weiner, *Can AI Create True Art?,* SCI. AM. BLOG, (Nov. 12, 2018), https://blogs.scientificamerican.com/observations/can-ai-create-true-art/#:~:text=Moreover%2C%20until%20AI%20can%20be,intention%20of%20its%20human%20masters [https://perma.cc/VS97-TYDW].

10. Sean Dorrance Kelly, *A Philosopher Argues that an AI Can't Be an Artist: Creativity Is, and Always Will be, a Human Endeavour,* MIT TECH. REV. (Feb. 21, 2019), https://www.technologyreview.com/2019/02/21/239489/a-philosopher-argues-that-an-ai-can-never-be-an-artist/ [https://perma.cc/SLE8-BECW].

11. Hao Zhan, Lingfeng Dai & Zhiwei Huang, *Deep Learning in the Field of Art, in* Proceedings of the 2019 International Conference on Artificial Intelligence and Computer Science, 717-719 (2019).

12. Ahmed Elgammal, *AI is Blurring the Definition of Artists,* AM. SCI., https://www.americanscientist.org/article/ai-is-blurring-the-definition-of-artist [https://perma.cc/R36Q-49G5].

13. Tatiana Siegel, *Warner Bros. Signs Deal for AI-Driven Film Management System (Exclusive)*, THE HOLLYWOOD REP. (JAN. 8, 2020, 12:23 PM), https://www.hollywoodreporter.com/news/warner-bros-signs-deal-ai-driven-film-management-system-1268036 [https://perma.cc/WW7B-4VU6].

14. Carlos A. Gomez-Uribe& Neil Hunt,*The Netflix Recommender System: Algorithms, Business Value, and Innovation,* ACM TRANSACTION ON MGMT. INFO. SYS. (TMIS) 6.4 (2015): 13.

15. Starling D. Hunter III, Susan Smith & Saba Singh, *Predicting Box Office from the Screenplay: A Text Analytical Approach*. *Journal of Screenwriting, 7.2 135-154* (2016).

16. Samantha Murphy Kelly, *Neon's artificial human is a scary glimpse of the future that's (mostly) still hype,* CNN Business (Jan. 10, 2020), https://edition.cnn.com/2020/01/10/tech/samsung-neon/index.html [https://perma.cc/G9PE-

sound, and behave like humans. The Neon technology is, however, still an early prototype; we are unlikely to see a wholly digital species replace real human actors, or even produce human emotion in Hollywood in the near future.[17]

B. Introductory Questions Regarding AI in the Creative Fields Vis-à-vis Copyright Law in General

No matter where or how AI becomes a part of Hollywood's magic, it may be a poor decision to incorporate AI if its outputs are not legally protected by intellectual property laws. Currently, it remains unclear if AI is legally considered an author within the confines of copyright regimes in various jurisdictions. For example, can an AI be granted legal authorship over the screenplays it produces, or can it be considered an inventor on a new type of Steadicam; can it even get a screenwriting credit? The last question is easy to answer: to our knowledge there has yet to be an Artificial Intelligent machine that has been accepted into the Writers Guild of America (WGA), the labor union representing, television, radio and film writers and screenwriters.

Importantly, if an AI cannot be an author within the scope of copyright law, then it cannot create copyrightable works: As we describe in greater detail in section III, copyright is granted only to original works of authorship fixed in a tangible medium. A work product lacking any one of these characteristics is not eligible for copyright protection. Thus, without a legal author providing the necessary authorship, no copyrightable work exists – only an uncopyrightable work that belongs to the public domain. This is often an undesired outcome as an uncopyrightable work that belongs to the public domain does not belong to any of the authors, human or otherwise. Works in the public domain are not optimal for Hollywood's bottom line as they cannot be licensed or protected unless those works are used as a source for further copyrightable material, as Disney is famous for doing.[18]

Simply looking to other areas of precedent, the future of AI as a creator in the entertainment industry looks bleak. Under current European and US patent regulations[19], an AI cannot be an inventor. This legal principle was recently demonstrated when both the European Patent Office and the United States Patent and Trademark Office separately[20] refused to patent applications listing DABUS,

---

3BPX].

17. Surabhi Agarwal, *Creating a personal connect with AI: Pranav Mistry, CEO, Samsung's STAR Labs*, THE ECON. TIMES (Jan. 24, 2020), https://economictimes.indiatimes.com/tech/internet/creating-a-personal-connect-with-ai-pranav-mistry-ceo-samsungs-star-labs/articleshow/73571303.cms [https://perma.cc/9RGD-CBRD].

18. Derek Khanna, *50 Disney Movies Based On The Public Domain,*FORBES (Feb. 3, 2014), https://www.forbes.com/sites/derekkhanna/2014/02/03/50-disney-movies-based-on-the-public-domain/#9927e5b329ce [https://perma.cc/KK36-SJUA].

19. Dennis Crouch, *USPTO Rejects AI-Invention for Lack of Human Inventor,* (Apr. 27, 2020), https://patentlyo.com/patent/2020/04/rejects-invention-inventor.html#:~:text=Dabus%20(DABUS)%20is%20not%20human,then%20DABUS%20created%20the%20invention [https://perma.cc/8ME6-GA65].

20. USPTO, Decision on Petition January 20, 2020 online at

an AI machine[21], as an inventor. Both patent offices ruled that to be patentable, an invention has to be thought up by a human and not a machine.[22]

Patent law notwithstanding, this paper will explore whether the same principles that limit AI as an inventor also apply to the US and Singapore copyright regimes, limit AI as an author, and determine whether that limitation is ultimately relevant for the entertainment industry.

The following section of the paper will give a basic overview of what artificial intelligence is. The third section will explore open questions regarding AI and copyright, including attempts to expand copyright beyond human authors, such as animal and plant authors. The fourth section will then provide an example of what type of creative work might include a mix of AI and human authors – one of the most common and lucrative areas where AI will meet copyright today. Sections five and six will specifically look at AI in Singapore and discuss Singapore copyright laws. Here, Singapore is an important case study as it has until now expressly not granted copyright protection to any non-human authors, including corporations that have many of the legal rights of persons. The seventh section will look at how Singapore applies copyright law to AI. The eighth section will assess whether AI can be an author under Singapore copyright law. The ninth section will then look to the work to hire doctrine as a potential vehicle to provide AI work with copyright protection in various jurisdictions, including the United States. The tenth and final section will provide conclusions.

II. HOW DOES AI LEARN?

Early computer algorithms were based on simple logical statements – "if this, then that." However, programming an algorithm that accounts for all possible situations using only these simple rules can be tedious, if not impossible. Today, AI machines using modern machine learning techniques employ algorithms derived from training data. The algorithms are optimized through iterative cycles of analyses of training information (e.g., the question with the correct answers), until the machine learns its own path to come to the desired decisions. More specifically, the AI analyses the training data until it can determine which characteristics within the data are statistically more likely to be indicative of the correct answer. Notably, those characteristics may be very different than what might be chosen by a human actor. Next, it incorporates those characteristics into the algorithm to assess what to do when it is confronted with new data. For example, if the algorithm is trying to learn what characteristics distinguish an image of a chihuahua from an image of a blueberry

https://www.uspto.gov/sites/default/files/documents/16524350_22apr2020.pdf

21. Stephen L. Thaler, *HOME OF THE CREATIVITY MACHINE*. Wall Street Journal, (Oct. 11, 2019).; *See also The Artificial Inventor Project*, ARTIFICIALINVENTOR.COM [https://perma.cc/4BA6-ZR59].

22. European Patent Office, *EPO refuses DABUS patent applications designating a machine inventor* (Dec. 20, 2019), EPO.ORG, https://www.epo.org/news-issues/news/2019/20191220.html [https://perma.cc/6J3P-LHHC].

muffin, the researcher would first provide sets of labeled images identifying the breakfast treat and the dog respectively. The algorithm would iteratively work through the images and extract characteristics that would be useful in distinguishing between the two types of images. In some instances, those distinguishing factors would be obvious to a human, for example, chihuahuas consistently have three black dots (two eyes and a nose) whereas images of blueberry muffins may have more dots. In other instances, the algorithm may tease out informative characteristics that distinguish between muffins and chihuahuas that the human eye would not have appreciated.[23]

Consider another example. Most human toddlers can differentiate between a dog and a cat, even when shown a dog or cat they have never seen before. Their brains have developed models wherein all cats look like cats, and all dogs look like dogs. Any effort to break this model down into individual rules would quickly become unwieldy and prone to error. Yet children intuit the difference, even if they cannot explain how. A machine that needs to distinguish between cats and dogs might learn the same way as a child. After seeing hundreds, thousands, or even millions of tagged images of cats and dogs (i.e., the training set), the machine determines a set of characteristics that will often distinguish between the two animals. Once it develops this discriminating algorithm, the machine can apply the algorithm to images it has never seen before. More technically, an AI machine employs training data to develop and hone a mathematical model. This model is then used to make predictions on novel data, mapping new inputs to predicted outputs. AIs have become better at learning in the last decade due in part to radical advances in AI research, as well as drastically falling computation and storage costs.[24] The cheaper it is to run increasingly faster algorithms on increasingly larger data sets, the more and better an AI can learn. The more data the algorithm has to learn from, the better it performs, and the iterative trial-and-error learning process can develop better algorithms.

Most AI today is narrow AI, with a very specific purpose. The more these AI systems train on existing data sets, the better they fulfill their particular purposes. However, some algorithms are becoming more human-like (i.e., better at multitasking), even achieving results simultaneously.[25] More recently, researchers have even attempted to encode human-like common sense into an

---

23. Cristian Duguet, *Chihuahua or Muffin*? MEDIUM, (Jan. 19, 2019), https://medium.com/@cristianduguet/chihuahua-or-muffin-51bca039e175 [https://perma.cc/W8ZJ-DFSQ].

24. Yoshua Bengio, *Springtime for AI: The Rise of Deep Learning, After decades of disappointment, artificial intelligence is finally catching up to its early promise, thanks to a powerful technique called deep learning,* SCI. AM. (June 1, 2016), https://www.scientificamerican.com/article/springtime-for-ai-the-rise-of-deep-learning/ [https://perma.cc/F6RM-PFT6].

25. Łukasz Kaiser & Aidan N. Gomez, *MultiModel: Multi-Task Machine Learning Across Domains,* GOOGLE AI BLOG (June 21, 2017), https://ai.googleblog.com/2017/06/multimodel-multi-task-machine-learning.html [https://perma.cc/N96X-NG3D].

AI; on the spectrum of machine learning, these attempts fall between a coded set of rules and completely random iterative machine learning: sparingly few rules are hard-coded, allowing the AI to learn from significantly fewer data points. [26]

However, with the continued employment of AI systems, there emerge considerations beyond the scope of this paper and beyond the role of AI within copyright. For example, as systems become more complex, algorithms may become so opaque in how they weigh characteristics and determine which data to employ, that their original human developers may not be able to fully appreciate how the algorithms work or assess whether they contain fatal errors, biases, or mistakes.

III. OPEN QUESTIONS REGARDING THE USE OF AI IN THE CREATIVE PROCESS

This paper focuses on the use of artificial intelligence in creating art. Here, we question who the authors are of AI-created art, and who owns what, if any, intellectual property rights for AI-created, designed, or implemented art.

First, it is unclear if authorship depends on whether AI relies on man-made creations as the learning data. So, one question that arises is whether the work of AI that *is* based upon algorithms, and those algorithms themselves are built upon copyrighted works as the training sets, is considered a derivative, a compilation, or even wholly unoriginal work in the eyes of the law. For example, a machine might employ natural language processing to read screenplays. Machine learning and other AI methodologies can then scan these large datasets of scripts to extract relevant ideas, themes, dialogue, and other factors. These features can then be used to build upon those prior works to create new machine-made texts that can become successful films. In these cases, has the machine simply extracted, via an algorithm, what it determines to be the best parts, and then compiled a new script based on the information it has garnered? In other words, is the new screenplay a derivative work? Or has the machine created something *sui generis*?

Second, does AI-created art infringe on the copyrighted works it is based upon? Depending on how the machine uses the input data, the original human creators of the source material may claim that the machine's product is an infringing derivative work. They might question whether the machine simply lifted the best elements from each of the scripts and then compiled them into a new product without copyright's necessary modicum of creativity, a requirement under copyright law for a protectable work.[27] Alternatively, perhaps the algorithm's method of successfully extracting the necessary data from each script is a non-trivial and original effort. If so, the combined results thereof should not be treated simply as a derivative work but rather something novel. This comports well with underlying theories of the idea/expression dichotomy, wherein it is

26. Matthew Huston, *How Researchers Are Teaching AI to Learn Like a Child*, SCIENCE (May 24, 2018), [https://perma.cc/9JC2-39KW]

27. *See, e.g.*, *Feist Publications, Inc. v. Rural Tel. Serv. Co.*, 111 S. Ct. 1282, 1288 (1991) (citing The Trade-Mark Cases, 100 U.S. 82, 94 (1879))

understood that all copyright creators extract ideas from various copyrighted and public domain sources. It is the creator's interpretation that grants the resulting work copyright as an original, non-derivative work. After all: "Good artists copy, Great artists steal."[28]

If this is accurate, then it is curious that many commentators find AI's reliance on early works problematic, yet do not find the same problem with human creators. Humans get away with rampant lifting of earlier art in their copyrightable works, allowing them to "benefit from further improvements or progress resulting from others' use of the same subject matter."[29] To wit: in the end, human creators and putative machine creators both use the same source material. Yet in human creativity we argue the author's prior knowledge informed her work, which is novel and not derivative, while we criticize AI for its dependence upon those same sources.

Finally, it is very difficult to tease out what is a derivative work and what is an original expression informed by ideas from previous works: "As Judge Hand acknowledged many years ago no principle can be stated as to when an imitator has gone beyond copying the 'idea,' and has borrowed its 'expression.'.[30] If the law supports creating non-derivative original copyrightable works from humans, why can we not make the same idea/expression argument for a machine? What makes a human author who reads a lot of source material different from a machine who has likely read even more?

To this end, some might argue that human knowledge consumes prior works, but it then employs a distinctly human creative process to weave that prior knowledge, via a uniquely human understanding and appreciation, into a new copyrightable product. That creative process is what the government grants copyrights for. For example, George Lucas, the creator of the multi-billion-dollar movie franchise "Star Wars," is well known to have been influenced by many other films in the making of his movies.[31] No one legitimately disputes Lucas' copyrights over the films in the "Star Wars" franchise. Yet, until now, copyright has yet to find the opportunity to discriminate between the seemingly similar methods of human and machine.

Regardless of the copyright nature of source material, even if the AI infringes upon said source material, if the resulting work is a creative or original copyrightable work, then either the programmer who coded the AI algorithms or the AI itself should be granted authorship over the (putatively derivative) work product, or both as co-authors or perhaps, neither, if neither the programmer or

---

28. Quote Investigator, *Good Artists Copy; Great Artists Steal*, QUOTEINVESTIGATOR, https://quoteinvestigator.com/2013/03/06/artists-steal/

29. *Reyher v. Children's Television Workshop*, 533 F.2d 87, 90 (2d Cir. 1976).

30. *Durham Industries, Inc. v. Tomy Corp.*, 630 F.2d 905, 912 (2d Cir. 1980).

31. Tim Robey, *10 Films that influenced Star Wars*, THE TELEGRAPH (Dec. 14, 2015), https://www.telegraph.co.uk/film/star-wars—a-new-hope/movies-influences-george-lucas/; Christopher Klein, *The Real history that Inspired "Star Wars"*, HISTORY (Aug. 22, 2018), https://www.history.com/news/the-real-history-that-inspired-star-wars

the AI is determined to be a legal author.

Finally, given the number of works involved in training the AI, it is likely that the contribution of each copyrighted work is minimal. When a court seeks to find infringement, "Substantial similarity must be determined through application of the 'ordinary observer test,' which considers 'whether an average lay observer would recognize the alleged copy as having been appropriated from the copyrighted work.'"[32]

A. Who is the Author of an AI Work: Some Initial Questions

In some instances, it may be easy to infer who ought to be the legal author. If an AI algorithm was coded as an incredibly simple set of instructions, then the programmer will likely be the author of the AI's creative output.[33] In other situations, it might be more difficult to ascertain legal authorship, especially if the AI machine employed an opaque process to analyze and assess scripts and even to develop its own iteration of the final algorithm. In some emerging cases, an AI can even rewrite its own code, such that the algorithm no longer consists of exclusively human coding, but also its own.[34] In these cases, the product may not have been simply created or predicted by the human coders on their own, rather there could be another potential author, the AI. It's even possible that in this case that we do not ascribe authorship to a human at all. The AI could be the sole legal author if the law allows such non-human authors. But in most instances, it will not be so black and white. In less clear cases, some have argued that an interpretation of copyright law that could grant an AI authorship must discern whether the inputs provided by humans and any associated creativity are distinct from the learning and production done by machines. We will argue later that it need not.

Alternatively, it may simply be that the copyright system has come to its conclusion that AI cannot be an author, the same way that an animal cannot be an author. This would be the conclusion regardless of the extent of the machine's human-like intelligence, or the extent of human input, whatsoever in the development of an AI algorithm. This rule, either by statute, regulation, or judicial determination is simply that the machine's learning and output can never amount to a protectable creative work. Just because. Again, our understanding of the copyright issues as described later will circumvent this entire train of thought.

In fact, given that there is no simple solution to this quandary, we aim to avoid resolving this issue entirely when seeking copyright protection for creative

---

32. *Solid Oak Sketches v. 2k Games*, 449 F. Supp. 3d 333, 344 (S.D.N.Y. 2020).

33. *See, e.g.*, Margot E. Kaminski, *Authorship, disrupted: AI authors in copyright and First Amendment law*, 51 U. C. DAVIS L. REV. 589 (2017) (discussing various scenarios with different potential authors).

34. Matt Reynolds, *AI Learns to write its own code by stealing from other programs,* NEW SCIENTISTS (Feb. 22, 2017), https://www.newscientist.com/article/mg23331144-500-ai-learns-to-write-its-own-code-by-stealing-from-other-programs/#:~:text=A%20machine%20learning%20system%20has,kind%20set%20by%20programming%20competitions.

works done by AI machines, as discussed in the penultimate section. Rather we seek to find copyright protection by circumventing the questions of AI authorship entirely, leaving it for a future when AI is further developed, more human-like and the question is riper.[35]

B. General Background Regarding the Metes and Bounds of Non-human Authors in Copyright

On the path to discerning what role AI plays within copyright authorship, there are some hints from various legal texts that would eventually help to resolve this issue. It should be noted that the question as to whether non-AI computers can be authors has been long-standing, stretching back to at least 1965.[36] In general, Professor Ginsburg, in developing a list of six characteristics that define authorship, noted the surprising paucity of discussion as to who or what can be an author within copyright law, as well as the frequent conflation of the legally distinct concepts of authorship and copyright ownership.[37] As examples of this conflation, Professor Ginsburg compared and contrasted the vesting of copyright ownership in non-human corporations in the U.K. with the actual vesting of authorship of copyright in the U.S. and the Netherlands in corporations. Other commentators note how many copyright laws don't typically define the author's creative process in determining the metes and bounds of authorship, they simply assume that an author has provided creativity to achieve a creative work.[38]

With this in mind, the Compendium of US Copyright Office Practices clearly states that a non-human author, specifically including nature, plants, animals, or supernatural beings cannot create a copyrightable work within the copyright system.[39] The compendium's conclusions regarding the inability of non-humans to be authors, among all the other rules and regulations therein hold a lot of weight in copyright jurisprudence: "When interpreting the Copyright Act, [courts will] defer to the Copyright Office's interpretations in the appropriate circumstances."[40]

The Compendium quotes the Supreme Court case Burrow-Giles to support the longstanding contention that an author must be human, but notably, the quote simply that "[a]n author . . . is 'he to whom anything owes its origin; originator;

---

35. *See generally* Ray Kurzweil, *Reinventing humanity: the future of machine-human intelligence*, THE FUTURIST 40, no. 2 (2006) at 39.

36. Pamela Samuelson, *Allocating Ownership Rights in Computer-Generated Works*, 47 U. PITT. L. REV. 1185, 1192 (1985).

37. Jane C. Ginsburg, *The concept of authorship in comparative copyright law*, 52 DEPAUL L. REV. 1063, 1070 (2002).

38. *See generally* Laura A. Heymann, *A Tale of (At Least) Two Authors: Focusing Copyright Law on Process Over Product,* 34 J. CORP. L. 1009 (2008).

39. U.S. Copyright Office, Compendium of U.S. Copyright Office Practices § 101 (3d ed. 2017). Sec. 313.2 Works Lacking Human Authorship "The US Copyright Office will not register works produced by nature, animals, or plants. Likewise, the Office cannot register a work purportedly created by divine or supernatural beings, although the Office may register a work where the application or the deposit copy(ies) state that the work was inspired by a divine spirit."

40. *Inhale, Inc. v. Starbuzz Tobacco, Inc.*, 755 F.3d 1038, 1041 (9th Cir. 2014).

maker; one who completes a work of science or literature,'"[41] which could conceptually include a smart machine capable of originating an expression within that quote as well. We cannot expect case law from a century prior to having predicted the advent of artificial intelligence, and as such, we ought not to read too much into the early examples of the anthropomorphism of authorship.

The Compendium further limits authorship by noting that "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."[42] But an AI acts neither randomly nor automatically. Automation is the completion of fixed repetitive tasks without human intervention; automation is predictable in that it follows a clear set of rules AI is different in that, while it is not random, it is also not always predictable, it need not follow a set of rules and it can be employed to complete non-repetitive tasks, learning for prior tasks to predict and complete tasks better, without continued human intervention and instruction.

In applying the Compendium's rules, in one case the court found that a living garden, ostensibly lacking human authorship, was not copyrightable under copyright law.[43] In a more recent case, the People for the Protection of Animals (PETA) sued to have the copyright of a selfie taken by a Celebes Crested Macaques granted to the macaques.[44] In this case, the owner of the camera that was left in the wild, David Slater, objected to the hosting of the image of the smiling macaques selfie posted online without his permission and sued for copyright infringement. One of the hosting companies, Wikimedia, claimed that as the image was taken by an animal itself, and an animal cannot create copyrightable works, the work must therefore fall within the public domain. PETA, which does not have much experience in copyright litigation, took a surprisingly weak tact, claiming that the animal owned the copyright. While Slater and PETA came to an out-of-court settlement, the appellate court hearing the case refused to dismiss the case, eventually ruling that an animal lacks statutory standing under the Copyright Act.[45]

In upholding the district court decision, the appellate court effectively concurred that Naruto, the macaques, is not an "author" within the meaning of the Copyright Act. In section 313.2 entitled "Works That Lack Human Authorship," the Compendium states that to qualify as a work of 'authorship' a work must be created by a human being. Works that do not satisfy this requirement are not copyrightable. Specifically, the Copyright Office will not register works produced by '"nature, animals, or plants" including, by specific

41. *Burrow-Giles Lithographic Co. v. Sarony*, 111 US 53, 58 (1884).

42. COMPENDIUM (THIRD) § 101.1(A), at 313.2.

43. *Kelley v. Chicago Park Dist.*, 635 F.3d 290 (7th Cir. 2011) (holding that "a living garden like Wildflower Works is not copyrightable").

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

45. *Id.*

example, a "photograph taken by a monkey." (internal citations omitted).[46]

What is conspicuously lacking is that there is no mention of AI machines, even though such machines were likely at least conceivable when even the first edition of the Compendium was drafted.[47] A great test case could be the area of video game design, which is just emerging as an area of AI creativity. Until recently, one of the areas where AI has had a hard time breaking into is video games, especially because they lack the predictability desired by gamers.[48] In the next chapter we will review the now growing applicability of AI in video games, and the legal questions that their inclusion raises.

IV. CO-CREATIONS OF MEN AND MACHINE – CO-AUTHORSHIP, WHAT ARE THE POSSIBILITIES?

One of the most likely areas where we might see some case law develop as to whether an AI can be an author may be in a case about video games where copyright is already in dispute. For example, the potentially copyrightable recorded gameplay of gamers is the result of authorship of both a human and an AI machine, without the programmer. [49]

AI (non-machine learning) has been a component of video games for decades. It has been used primarily to create and control the non-player characters (NPCs).[50] Although early efforts were substandard to what would be considered AI today, there have been significant advances in the quality of AI in

---

46. *Naruto v. Slater,* No. 15-cv-04324-WHO (N.D. Cal. 2016).

47. The Compendium of U.S. Copyright Office Practices: Chapter 300, https://www.copyright.gov/comp3/chap300/ch300-copyrightable-authorship.pdf

48. Guillermo Díaz. and Andrés Iglesias, *Evolutionary Behavioral Design of Non-Player Characters in a FPS Video Game Through Particle Swarm Optimization*, 2019 13TH INTERNATIONAL CONFERENCE ON SOFTWARE, KNOWLEDGE, INFORMATION MANAGEMENT AND APPLICATIONS (SKIMA) 1-8 (2019) (In describing the use of AI in developing Non-Player Characters (NPCs): ". . .the enemy NPCs should not be too unpredictable that their reactions turn out to be too odd or even stupid very often, making the human player to get annoyed by this erratic and indecipherable behavior."); *See also* Nick Statt, *How Artificial Intelligence Will Revolutionize the Way Video Games Are Developed and Played,* THE VERGE (Mar. 6, 2019), https://www.theverge.com/2019/3/6/18222203/video-game-ai-future-procedural-generation-deep-learning .

49. Carol Pinchefsky, *6 Ways AI Is Making an Impact on Video Games*, HEWLETT PACKARD ENTER. (July 2019), https://www.hpe.com/us/en/insights/articles/6-ways-ai-is-making-an-impact-on-video-games-1907.html.

"Although AI programmers have made big advances in machine learning optimization that generates game content, don't expect to see AI-based procedurally generated content anytime soon. 'Developers are risk-averse,' Togelius says. 'They're hit driven, so they play it safe.' .

50. *Id.*

"You can see AI at work when you pick off one NPC and its fellow henchpeople become alert and twitchy. They might even determine your location and come looking for you. You also see AI at work when an NPC crouches for cover when you enter a room. Or, if you have a companion, the companion follows you at your pace. Good AI makes your game a place you can inhabit and enjoy. Poor AI, on the other hand, results in NPCs who do not follow you but endlessly collide into doors. Or NPCs who don't react when you kill the henchbuddy standing. right. next. to. them. This nonsensical behavior leads to immersion-breaking experiences."

modern video games.[51] In increasingly more modern games, AI is used beyond just the background players. For example, it is used for generating potentially copyrightable, non-functional, realistic images and video to create a space for human players to interact. However, the use of AI today is still somewhat limited. AI can make games a bit more unpredictable to both the end-user as well as the programmer,[52] and it turns out, gamers are only recently becoming interested in this type of stochastic gameplay. [53]

When the player interacts together with the AI in the virtual space, that space may change both functionally and visually as the human player moves through the environment. In these cases, both the human and the AI would seem to make both independent and dependent decisions that can result in a copyrightable work: the recorded gameplay.

The relatively new and lucrative trend of professional video game player gameplay videos is gaining in popularity both among amateurs as well as professionals.[54] This is especially the case in popular video games such as Fortnite, where millions of viewers around the world watch, and even pay to watch, professional players' recorded gameplay.[55] We are not the first to contemplate the role of copyright in limiting video game streaming.[56]

Copyright cases where the gamer and the video game company square off regarding the copyright of the derivative gameplay and the lucrative ownership rights are especially relevant in determining the copyrightability of AI works.

Video game players around the world record their gameplay, along with comments and observations, that they then upload to a platform for others to watch and enjoy. Unlike sports broadcasts where the video of an event is a copyrightable work in that it contains creative decisions within the filming of the work itself, video game gameplay is not simply the recording of an event – it is the active creation and simultaneous recording of an audio-visual creation resulting directly from decisions that the gamer and the video game make together.

---

51. Nick Statt, *supra note* 49; *See generally,* Safadi, Firas, Raphael Fonteneau, and Damien Ernst, *Artificial Intelligence in Video Games: Towards a Unified Framework*, 2015 INT'L J. COMPUTER GAMES TECH. (2015); Kopel, Marek, and Tomasz Hajas, *Implementing AI for non-player characters in 3D video games*, Asian Conference on Intelligent Information and Database Systems, Springer (2018).

52. Jeffrey Georgeson & Christopher Child. *NPCs as People, Too: The Extreme AI Personality Engine*. *arXiv preprint arXiv:1609.04879* (2016).

53. Ruben Rodriguez Torrado, et al., *Deep Reinforcement Learning for General Video Game AI*, *2018 IEEE Conference on Computational Intelligence and Games (CIG)*. IEEE, 2018.

54. Mehdi Kaytoue, et al., Watch me playing, I am a professional: a first study on video game live streaming. *Proceedings of the 21st international conference on world wide web*. 2012; Elizabeth Brusa, *Professional Video Gaming: Piracy That Pays*, J. MARSHALL L. REV. 49 (2015) (discussing some of the copyright concerns arising from the emerging industry of professional gamers): 217.

55. Cycu1 (2017). *Fortnite Battle Royale - My Very First Win!!! PS4 Pro Gameplay*, *YouTube*, YOUTUBE (Oct. 7, 2017), www.youtube.com/watch?v=Kavmf3RYEjI

56. Eirik Evert Elias Jungar, *Streaming Video Games: Copyright Infringement or Protected Speech?* 3 PRESS START (2016), 22-47.

The game engine and the game platform run the game independently in response to the player's actions and choices. More specifically, if a human player makes a right turn in a game, the AI could generate a landscape that would have been different had the human player made a left turn. Moreover, the NPCs will act differently depending on how the human gamer acts and interacts. [57] The sum total is a real-time or delayed broadcast created by the player, of the player's decisions and the AI responses to those decisions, without necessarily any substantive input from the game's human coders and developers.

Like the emerging world of VR broadcasts that allow the user to decide what angle they want to view the broadcasted performance, regardless of any creative decisions made by the broadcaster,[58] the nature of this new copyrightable work, if it's copyrightable at all, is still legally indeterminable. Is it a cinematic work, like a film, is it simply software, or is it something *sui generis*?

Assuming that such creative works are copyright eligible, the copyright of these recorded gameplays could belong to (i) the publisher of the video game alone, (ii) both the publisher and the gamer as co-authors, (iii) the gamer alone, or (iv) the player, the publisher and the AI that encodes the de novo images and the stochastic NPCs. When considering the options, it is unlikely that the gameplay is owned wholly by the publisher, unless it was specifically carved out in the software license as a condition for playing. [59] It is also unlikely that the copyright is owned jointly. Given the lucrative market for gameplay videos, we would assume that a publisher would have attempted to split the revenues with the players if they thought they legitimately owned some, if not all, of the work. Alternatively, publishers may be loath to harass their most popular players that drive interest and thus additional revenue, even if they do legally own at least part of the work.

Perhaps then, the copyright vests in the human player of the game who records her own gameplay, provided that the player's recorded play contains the minimum characteristics of originality for copyright, and thus is deserving of copyright protection. But not everyone agrees with this view.[60] In one view, the tree of every possible outcome in a game is predetermined by the code developers of the game itself and then executed on a platform. The gamer herself may not have copyright if her gameplay lacks the requisite originality or if the gamer's

---

57. Wim Westera, et al., *Artificial Intelligence Moving Serious Gaming: Presenting Reusable Game AI Components*, 25 EDUC. INFO. TECH. 351, (2020).

58. *See* Marie Hopkins. *Live Sports Virtual Reality Broadcasts: Copyright and Other Protections,* 16 DUKE L. & TECH. REV.141, 142-43 (2017).

59. *But see Stern Elec., Inc. v. Kaufman*, 669 F.2d 852, 856 (2d Cir. 1982); *See e.g, Atari Games Corp. v. Oman*, 888 F.2d 878, 884 (D.C. Cir. 1989) (holding that authorship resulting from the actions of the gamer and the programming of the programmer fall to the programmer only, as the actions of the player are limited within the scope of possibilities within the game. Modern games where AI has created some of the imagery would arguably be distinguishable).

60. Madeleine A. Ball, *Nerf This: Copyrighting Highly Creative Video Game Streams as Sports Broadcasts*, 61 WM. & MARY L. REV. 253, (2019).

actions are severely constrained by the rules of the game.

In another option, sufficient originality can come from the collaboration between the AI and the player, in conjunction with the publisher (i.e., the choices the player makes in their gameplay require the AI to develop particular original backgrounds and other video game elements). This raises another legal question: whether the AI is a copyright holder independent of the status of the publisher or as an employee of the publisher. In addition to questioning whether a gameplay video is copyrightable at all, gameplay videos may also have to deal with their own set of legal concerns with regard to infringement. For example, should the recorded gameplay videos be considered "derivative works" of the original copyrighted video game, and therefore themselves regarded a copyright infringement when they are uploaded onto video platforms like Twitch and Youtube?

What have been the legal outcomes of these potentially seminal cases, if any?

In general, it is thought that video game publishers appreciate the free publicity that these gamers and their gameplay provide, and as such tacitly permit players to upload videos; i.e., tolerated infringement.[61] Nevertheless, this tolerated infringement comes at the mercy of the game publishers which could claim to reserve the right to enforce their copyrights when necessary. And they sometimes do. [62] There have been at least a handful of documented attempts to enforce video game publisher copyrights. Players who have recorded their play have claimed either fair use or implied license in their defense. [63] In 2017, video game publisher Campo Santo claimed that their copyright to the game *Firewatch* was infringed by PewDiePie, a popular poster of video gameplay content, after PewDiePie was accused of using insensitive language against the terms of the EULA.[64] After the offensive videos were removed PewDiePie released an apology. [65]

But until a court actually rules on this issue, it is hard to discern whether recorded gameplay is copyright infringement or fair use of the original content or something sui generis. Adding commentary to the video might be considered transformative within the law of copyright, but that commentary is clearly the creation of the human, and not the AI, in this example.

---

61. Shigenori Matsui, *Does It Have to Be a Copyright Infringement: Live Game Streaming and Copyright*, 24 TEX. INTELL. PROP. L. J. 215, 288 (2016).

62. *Id*. at 227.

63. Miller Freeman, *The Use of Digital Millennium Copyright Act to Stifle Speech Through Non-Copyright Related Takedowns*, 10 SEATTLE J. TECH. ENVTL. & INNOVATION L. 256, 267 (2020).

64. Jonathan Ore, *Is Playing Video Games on YouTube A Copyright Infringement? No One Wants to Find Out*, CBC NEWS (Oct. 7, 2017), https://www.cbc.ca/news/entertainment/youtube-gaming-pewdiepie-fair-use-1.4309312; *See also* Freeman, *supra* note 65 n10.

65. Blake Drewry, *Is A Copyright Violation "Game Over" for PewDiePie?,* CLO: CAMPBELL LAW OBSERVER (Oct. 2, 2017), http://campbelllawobserver.com/is-a-copyright-violation-game-over-for-pewdiepie/

In short, copyright ownership of recorded video game gameplay is not yet fully decided, but when a case is finally adjudicated, it could go a long way in helping to decide whether AI can create copyrighted work. Like AI-created works, the question that some courts may need to decide is whether the decisions that the player makes in the game create novel copyrightable content or not. More specifically, is the recorded content by a gamer, novel content that is the combination of the decisions made by the player and the AI in creating novel and original images, scenes, characters, and NPC interactions. Or not. In some jurisdictions, however, the answer need not to wait for such a case. For example, in Singapore, the law seems clear that a computer cannot be a copyright author.

V. INSIGHTS FROM SINGAPORE INTELLECTUAL PROPERTY LAW

Singapore's intellectual property ("IP") environment has been consistently ranked among the best in the world.[66] The city is ranked fifth most innovative in the world, and its IP system is deemed the best in its region.[67] Given this stellar performance, it may be fruitful to analyze Singapore's IP laws for insights on what the legal status of AI-created works should be. Singapore is a common law system and was previously a British colony. Before 1987, the laws of the United Kingdom, including the Imperial Copyright Act 1911, formed the basis of Singapore's IP laws. However, Singapore developed indigenous IP laws in 1987 with the passing of the Copyright Bill. Since then, it has continued to nurture a unique IP system through legislative reform and judicial decisions that occasionally diverge from the United Kingdom's case law. Nevertheless, case precedents from the United Kingdom and other commonwealth jurisdictions are still persuasive in Singapore courts.

The crux of this chapter is to examine whether AI-generated works qualify as copyrightable works under Singapore law. To qualify for copyright protection, AI-generated works must contend with the following hurdles: whether the work can be classified as a *literary, dramatic, musical or artistic* work[68];

a) originality; and

b) the need for an author.[69]

Hence, this chapter will look at the state of machine creation, the requirement of originality, the conceptualization of machines as authors, and whether any human can lay claim to authorship of AI-created works. While the issue of AI-generated work has yet to be directly considered by Singapore courts, the following discussion will draw on principles based on existing case law.

66. Lorenzo Montanari, *Will Singapore Be the Next Intellectual Property Hub?*, FORBES (Sept. 19, 2017), https://www.forbes.com/sites/lorenzomontanari/2017/09/19/will-singapore-be-the-next-intellectual-property-hub/#2c24b30f7da4 [https://perma.cc/2QT7-L54K].

67. Intellectual Property Office of Singapore. (n.d.). *Singapore's IP ranking*, https://www.ipos.gov.sg/about-ipos/singapore-ip-ranking [https://perma.cc/3M75-XALH].

68. Creation Rec. v. News Group. Newspapers Ltd. [1997] EMLR 444.

69. Asia Pacific Publ'g Pte v. Pioneers & Leaders (Publishers) [2011] SGCA 37.

A. Classification of an AI-generated Work in Singapore

The first hurdle a creation must overcome to qualify for copyright protection is classifications as a "literary, dramatic, musical or artistic work." This classification was established in the case of *Creation Records v. News Group Newspapers* (1997). In *Creation Records*, the plaintiff constructed a scene as the backdrop for a photoshoot. This backdrop showcased a unique set-up of a Rolls Royce placed inside a swimming pool. Secretly, the defendant captured photographs of the backdrop and published these photographs. In court, the plaintiff argued that copyright subsisted in the special arrangement of the props in the backdrop and that the defendant had thus infringed this copyright. However, this argument failed as the court found that a backdrop could not be classified as either a literary, dramatic, musical, or artistic work. As such, AI-generated work must be classified as literary, dramatic, musical, or artistic before it can be protected by copyright.

Fortunately, the definitions for "literary", "musical" and "artistic" are relatively clear. For instance, AI-generated poems, books, and journalistic articles are evidently "literary" as they take the form of words. Jingles and songs are "musical" since they consist of musical notations. "Artistic work" has been carefully defined in section 7(1) of the Copyright Act, and includes AI-created digital drawings, maps and other diagrams.[70] In addition, there is no requirement for literary/musical/artistic merit.[71] In other words, AI does not need to be "good" at its art for its art to be protected. This removes the need for a subjective assessment by the courts, which renders the definition of "literary," "musical" and "artistic" more clear-cut. Hence, even an infant's uninspired doodles can be protected as an artistic work. The medium matters; talent and quality do not.

On the other hand, "dramatic work" is less clearly defined and contains some element of subjective assessment. As such, the issue of copyright in AI-generated films is complicated and worth discussing. In any film, at least two types of copyright protection will arise and subsist independently under section 171(1) of the Copyright Act: (1) the cinematographic film itself (the video); and (2) the underlying script or screenplay, which is protected as a dramatic work.

The question of when a script is copyrighted has been considered in *Green v Broadcasting Corporation of New Zealand* (1989).[72] In that case, the plaintiff was the host of a talent show TV program. As each episode's content depended on the contestant's performances, the content was not predictable and there was no fixed script for the host to follow. However, there was a "format" that was utilized in every episode, including catchphrases used at specific junctures of the show, and the use of a device called a "clapometer" which gauged audience reaction. The plaintiff claimed that the defendant had infringed its copyright by producing a talent show with a similar format. According to the plaintiff, this

70. Straits Engineering Pte v. Ang Sin Liu Shipyard Pte [1994] SGHC 256.
71. Univ. of London Press v. Univ. Tutorial Press [1916] 2 Ch 601.
72. Green v. Broadcasting Corporation of New Zealand [1989] RPC 700.

format constituted a "script" protected by copyright law. However, the court rejected this argument. The court set out two requirements for something to be protected as a dramatic work. First, the work must have an element of performance such as a musical or dramatic show, not a sequence of acts unrelated to the previous. Second, it must also have a plot or theme which unifies the gestures and movements that make up the performance. Hence, a choreographed dance is a dramatic work as there is an element of performance, as well as a theme that ties all the dance steps together. However, features such as a "clapometer" or catchphrases lack unity as they are unrelated to each other; the only commonality is that they are both used in the presentation of other copyrighted matter.[73] The courts' interpretation of copyright law in Singapore would therefore seem to be originalist in its nature, with a strict reading of terms and an inability to allow for broadening the scope of copyright protection.

As can be seen, phrases such as an "element of performance" and "unity" are relatively subjective and leave much room for interpretation. To this end, an AI-generated script in Singapore could potentially fail to qualify as a dramatic work because it might lack a unifying plot. Although an AI can write individual scenes, it might require a highly sophisticated AI to create a sense of progression between scenes or to work from a thematic message. After all, many AI story-writing programs function by detecting correlations – such as by predicting which words usually follow other words in a given context[74]– but not by detecting cause and effect.[75] In other words, they make decisions based on probability (i.e. which words are more likely to appear together) instead of meaning (i.e. what will the reader understand if I group these words). Thus, while the AI-generated work may lack a sense of continuity and semantic coherence."[76] without the help of human editors or co-contributors, For example, viewers of the earlier described wholly-AI-generated film, "Sunspring," felt that it was absurd, confusing, and noted that "there's no plot".[77] Readers of the wholly-AI-generated fiction "1 the Road" also lamented that there was no "cohesive arc in any classic narrative sense".[78] Nevertheless, the AI could be considered a co-author with a human author who helps create the narrative continuity.

---

73. *Id.*

74. Max Deutsch, *How to Write with Artificial Intelligence,* MEDIUM.COM (Jul. 12, 2016), https://medium.com/deep-writing/how-to-write-with-artificial-intelligence-45747ed073c

75. *See* Roxanne Pinto, *Will AI Take My Writing Job?*, MEDIUM.COM (Nov. 13, 2018), https://medium.com/google-design/will-ai-take-my-writing-job-bb4400fdfdd0

76. Robert Dale, *GPT-3: What's it good for?*, 27 NATURAL LANGUAGE ENGINEERING 1 113-118, (Jan. 2021); *See also* Alabdulkarim, A., Li, S. and Peng, X., *Automatic Story Generation: Challenges and Attempts*, *arXiv preprint arXiv:2102.12634. ("The problems of plot incoherence and illogical plot generation are far from being solved. Both are still very active research areas and can be an interesting future research direction.")*

77. Joey Paur, *SUNSPRING Is A Hilariously Confusing Sci-Fi Short Written by an A.I. Neural Network,* GREEKTYRANT.COM (2016), https://geektyrant.com/news/sunspring-is-a-hilariously-confusing-sci-fi-short-written-by-an-ai-neural-network

78. Brian Merchant, *When an AI Goes Full Jack Kerouac: A Computer Has Written A "Novel" Narrating Its Own Cross-Country Road Trip*, THE ATLANTIC (Oct. 1, 2018).

Moreover, as AI continues to improve in leaps and bounds, likely, more AI programs will eventually be able to create a unified plot or theme. Already, a human has teamed up with an AI to write a novel, which passed the first round of screening for a national literary prize in Japan.[79] It essentially churned out a story, "The Day a Computer Writes a Novel," that surpassed those of other human authors in that it passed the first of four selection rounds for the prestigious Hoshi Shinichi Award, while other novels by human authors did not.[80] Additionally, researchers in Open AI have developed a program that pens short news-like stories that are so convincing that its creators declined to make the program publicly available for fear that it will be used to spread misinformation.[81]

Overall, it is uncertain whether a particular wholly-AI-created script can be copyrighted. The answer depends on the facts of the case itself, and in particular, whether the scenes in the script display a sense of unity.

1. AI-generated Work as "Original" in Singapore

The next hurdle for copyright protection in Singapore is the requirement of "originality." The requirements for originality are set out in Singapore's case law.[82] There are three key points. First, in Singapore law, originality does not refer to novelty, uniqueness, nor inventiveness. Instead, work is original so long as the author created it instead of copying it from another.[83] Hence, a simple stickman drawn by a preschooler is original as long as the child did not copy it from another source.

Second, it is not necessary for the ideas or thoughts underlying the work to be original; rather, the requirement of originality relates to the form in which the work is expressed. Hence, copyright subsists even in an unremarkable drawing of a hand making a checkmark in a box;[84] although the artist may have taken the idea for such a drawing from someone else. The copyright exists because the artist did not try to imitate the drawing of another while he was putting paper to pen. In other words, copyright is not concerned with the originality of the *idea* per se, but with originality in the *expression.*[85]

Third, work is original if it is created through intellectual effort, skill, or judgment, but only a very small "spark" or "minimal degree" of intellectual effort

79. Natalie Shoemaker, *A Japanese AI Writes a Novel, Nearly Wins Literary Award*, BIGTHINK.COM (Mar. 24, 2016), https://bigthink.com/natalie-shoemaker/a-japanese-ai-wrote-a-novel-almost-wins-literary-award

80. *Id*.

81. Rachel Metz, *This AI is So Good at Writing That Its Creators Won't Let You Use It*, EDITION.COM (Feb. 18, 2019), https://edition.cnn.com/2019/02/18/tech/dangerous-ai-text-generator/index.html.

82. Global Yellow Pages v. Promedia Directories Pte [2017] SGCA 28 at 24.

83. Auvi Pte v. Seah Siew Tee [1991] 2 SLR(R) 786.

84. Kenrick v. Lawrence (1890) L.R. 25, Q.B.D. 99.

85. Flamelite (S) Pte v. Lam Heng Chung [2001] SGCA 66.

is required.[86] For instance, "minimal degree" can be satisfied by something as simple as recognizing an opportunity for a great photograph, pointing a camera, and pressing the shutter button.[87] Arranging facts in an interesting and user-friendly sequence would also be an act of originality.[88] In contrast, arranging facts in no order at all, or merely in alphabetical order, does not contain even a "spark" of originality as is the case in the United States and provided by the U.S. Supreme Court in *Feist Publications, Inc. v. Rural Telephone Service Company, Inc.*[89]

One question raised earlier is whether AI-generated works are original even though they are all "copied" from the work of another. Notably, programmers train the AI with data and examples ("training materials") to provide the AI with the references and tools with which it can create works.[90] These training materials often include copyrightable works from which the AI may "take inspiration". Thus, it may seem that AI-generated work is copied and unoriginal.

However, in Singapore as in many other jurisdictions, the fact that a derivative work substantially copies from its source material ought to have no impact on the question of whether the derivative work is original: a derivative work is copyrightable by statute. As the court in *Virtual Map*[91] stated, "where [the] existing subject matter was used in creating a work, copyright could vest in the creator of the work if he expended sufficient skill and labor such as to make the work original."[92] As an illustration, imagine that someone named Poe has written a poem. If Edgar copies Poe's entire poem but changes it by adding an extra line of words at the end, Edgar's work is original (albeit derivative) because he has put in a "minimal degree" of effort.[93] If Allan comes along and copies Edgar's poem, Edgar can sue Allan for copyright infringement.

Applying this to the context of AI-generated works, even if the copyright holders of the training materials could succeed in an action of copyright infringement against the owners of the AI-generated work, this does not necessarily negate the subsistence of the copyright in the AI-generated work itself. So long as the AI-generated work was not a slavish copy of its training materials, but contained material alternations, it still has originality. AIs are typically programmed to include random elements in its creative process. These elements are arguably material alterations sufficient to make the AI-generated work an original derivative work.

---

86. Feist Publications, Inc. v Rural Tel. Serv. Co., 499 U.S. 340 (1991).
87. Antiquesportfolio.com plc v Rodney Fitch & Co. [2001]FSR 345.
88. Asia Pacific Publishing Pte., *supra* note 49.
89. *Feist Publications, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 342 (1991).
90. Carbonell et al, *Machine Learning*, 3-23 (1983) (overviewing machine learning).
91. *Virtual Map (Singapore) Pte Ltd v Suncool International Pte Ltd* [2005] 2 SLR(R) 157 at 8
92. *Id.*
93. *See, e.g.,* Compendium, *supra* note 48, at §308 "To qualify for copyright protection, a work must be original to the author," which means that the work must be "independently created by the author" and it must possess "at least some minimal degree of creativity.". (" ")

Another objection to AI-generated works meeting the "originality" requirement of copyright protection under Singapore law may be that these works do not result from human intellectual effort because computers have no human intellect. From a philosophical standpoint, one might argue that computers are incapable of intellect since only humans are endowed with free will and deliberative imagination. John Searle famously argued that artificial intelligence does not "think" or "understand."[94] This, he contends, is because it can only ever be programmed to respond to syntax (symbols), not semantics (meaning), and semantics cannot be derived from syntax.[95]

Singapore courts have likewise failed to rule on whether AI-generated works can possess the intellect required for "originality." While the court in *Global Yellow Pages* held that originality requires the "engagement of human intellect,"[96] the court was not contemplating works made by artificial intelligence as it was far from the scope of the case. It is possible that the court was merely referring to intellect in the context that it is normally referred to and did not intend to expressly exclude machine intelligence. After all, previous case law did not mention any need for the *human* intellect. Overall, it is unclear whether AI is capable of the intellectual effort required for copyright to subsist.

2. The AI as an Author in Singapore

Section 30(2) of the Copyright Act provides for the general rule that although an author can transfer his/her copyright to someone else, the *first* copyright owner of any literary, dramatic, musical, or artistic work will be the author.[97] The Act is silent as to whether the meaning of "author" is confined to natural persons. The only illustration of what constitutes an "author" is provided in section 7(1), which defines the author of a photograph as the person who took the photograph.[98]

Although the Copyright Act is silent, Singapore case law has indicated that authors should be defined particularly narrowly, in that only natural persons can be authors: In *Asia Pacific Publishing Ltd Pte Ltd*,[99] the court held that an incorporated body cannot be an "author". The court declared that an author, under the Singapore copyright regime, must be a human author. The rationale for the decision was that the duration of copyright is defined in terms of the lifespan of the author plus 70 years.[100] If authors were not natural persons but entities that

94. John Searle, *Mind, Brains, and Programs*, Behavioral and Brain Sciences 3(3), 417-457 (1980).

95. *Id.*

96. *Global Yellow*, *supra* note 83.

97. Singapore Copyright Act Chapter 63 1987, revised 2006 §30.2

98. *Id.* at §7.1

99. Asia Pacific Publishing Pte Ltd., *supra* note 49, at 37.

100. *Id.* at 60 "Since the duration of copyright protection has always been based on the author's life expectancy and the rationale for the postmortem auctoris term was to benefit two generations of the author's heirs, it is patently clear that incorporated bodies were never contemplated to have been "authors" for the purposes of copyright. It would be absurd to suggest

could live forever, then works made by such non-humans would be protected by a perpetual monopoly. This, the court held, could not have been the drafter's intention. To this end, *Asia Pacific* foreclosed the possibility of machines being authors of copyrighted works under Singapore law. Singapore law tends to be influenced by UK law, as Europe perceives copyrighted works to be an extension of their authors' personalities,[101] giving rise to, sometimes, inalienable moral rights. It would seem, that if only natural persons have personalities, this certainly clashes with the concept of a non-human author.

Notably, the 1995 TRIPS convention, the most comprehensive multilateral agreement in intellectual property,[102] does not speak explicitly to the option of having a corporate entity, (i.e., one without a personality) as the author vis-à-vis the term of protection. However, the earlier Berne convention in Article 15(2) does allow for some possibility of a corporate author: "(2) The person *or body corporate* whose name appears on a cinematographic work in the usual manner shall, in the absence of proof to the contrary, be presumed to be the maker of the said work." (emphasis added)[103]

Some might be comforted by the fact that machines cannot be authors. For one thing, authors are by default the owners of copyright due to §30(2) of the Copyright Act, and to give machines property rights reads like the beginning of a dystopian novel. On the other hand, AI-generated works can have as much merit and value as works made by humans.[104] Furthermore, refusing to grant AI-generated works copyright protection could discourage companies from investing in sophisticated AI, disadvantaging society as a whole.[105] Additionally, in some instances, if the AI is not the copyright author, then there is no author, and if there is no author, there may not be any copyright protections. For these reasons, the law should be motivated to find copyright subsistence in such works, despite their AI origins.[106]

Although machines cannot be treated as authors of AI-generated works, AI-generated works are capable of being protected under the copyright regime. If AI cannot be authors, could one identify a human who has authored the AI-generated work? There are three possible candidates: (1) creators of the AI ("programmers"); (2) creators of the AI's training materials; and (3) users of interactive AI.

---

that a company could have a lifespan, let alone generations of heirs. Thus, it must follow that authors have to be living persons.

101. *See* European Parliamentary Research Service for the European Parliament, *Copyright Law in the EU*, Jun. 2018, at 179.

102. WTO (World Trade Organization) Overview of the TRIPS Agreement, [https://www.wto.org/english/tratop_e/trips_e/intel2_e.htm]

103. Berne Convention for the Protection of Literary and Artistic Works, (Sep. 9, 1886), [https://perma.cc/E3P2-KKKK]

104. Robert Denicola, *Ex Machina: Copyright Protection for Computer-Generated Works*, 69 RUTGERS L. REV. 1, 251-287 (2016).

105. Andres Guaramuz, *Artificial Intelligence and Copyright*, WIPO Magazine (2017), [https://perma.cc/XQH5-HP3P]

106. Berne Convention for the Protection of Literary and Artistic Works, (Sep. 9, 1886).

Like the producers of the film Sunspring, one might argue that the AI is merely a tool for the human programmer. In other words, the use of algorithms and machines by the programmer to generate an artwork is akin to the use of a camera by a photographer to create a photograph. Viewed in this light, the programmer is no different from the photographer-author as illustrated in section 7(1) of the Singapore Copyright Act. However, upon closer analysis, the analogy is incorrect. While the efforts of a photographer constitutes authorship (i.e. looking for the perfect timing and angle, adjusting the lens and focus, clicking the shutter button etc.), the efforts of the programmers do not necessarily constitute authorship, especially when dealing with more advanced AI such as machine learning or deep learning. Instead, it is arguably at least the autonomous actions of the AI that constitute authorship.

In *Asia Pacific*, the court held that a person who only provides the ideas used to create the work, or who provides mere "preparatory efforts" is not the author. This is because ideas and preparatory efforts are not protected by copyright. Hence, the court held that the effort expended in collecting facts about racehorses is merely "preparation" for the creation of a diagram about racehorses. On the other hand, effort expended in selecting the most interesting facts and arranging them in a presentable manner amounts to "authoring." As the court puts it, it is the "thought effort involved in creating the particular form of expression that is embraced by copyright." Applying this to AI-generated works, programmers provide only "preparatory efforts" and thus cannot be the authors. The efforts of the programmers can be classified as follows.

First, the programmers create an AI program. The program is in itself a literary work protected by copyright. It can be highly creative in the structure and implementation of the algorithm, but the underlying code of the operational algorithm is separate from the eventual AI-generated work. Thus, copyright over the AI-generated work must be established separately.

Second, the programmers provide input parameters and specify an end-goal. While this gives the AI an *idea* of what it is expected to produce, these ideas are not protected by copyright. For example, if one approaches Dutch painter Rembrandt and requests for a self-portrait, one has suggested to Rembrandt the idea for a portrait. However, it is Rembrandt who applies the brush to a canvas and authors the painting. Similarly, the AI behind the Next Rembrandt was given the goal of creating a Rembrandt-style painting.[107] Yet, the programmers did not dictate the color and arrangement of pixels in the Next Rembrandt; that was decided by the AI.

Third, the programmers provide the AI with training materials, e.g., in the case of Next Rembrandt, the library of Rembrandt's works. This helps the algorithm to identify patterns, insights, and principles, which it ultimately uses

107. *See, e.g.,* Shlomit Yanisky-Ravid & Louis Antonio Velez-Hernandez, *Copyrightability of Artworks Produced by Creative Robots and Originality: The Formality-Objective Model*, 19 MINN. JL SCI. & TECH. 1 (2018).

to create the final product. However, training the AI is a preparatory step – essential for the final result to be created, but not part of the creative process itself. By analogy, a professor who coaches a student in the art of creative writing is not the author of the student's novels. As important as the education might have been to the student's talent, the professor played little part in the creation of the eventual copyrighted story.

Case precedents support the conclusion that programmers are not always the authors of their program's creations. Take for example the Australian case of *Telstra Corporation Limited,*[108] which was cited with approval by the Singapore courts.[109] In *Telstra*, a computer system compiled listings into a directory, and its owners argued that the compilation was protected by copyright.[110] The court held that there had been no human author and that the programmers were not authors, because "the person operating [the] program is not controlling the nature of the material form produced by it,"[111] but only "giving [the software] instructions at the very highest level about the principal parameters of the directories"[112] Therefore, programmers are not the authors of AI-generated works, regardless of the argument's intuitive appeal.

An unlikely potential author for the work of an AI system could be the primary source of material from which the AI learned to create. Succinctly, AI "learns" by analyzing curated and non-curated training materials, which may include another party's copyrighted works. The question then becomes whether the authors and/or curators of the training materials can be identified as the authors of AI-generated work.

Going back to the principle that expressions, not ideas, are protected by copyright, the answer is likely no. To understand this dichotomy, consider how expansive the buddy cop genre is. If ideas were protected there would only be one, likely the 1982 film, *48 Hrs,* starring Nick Nolte and Eddie Murphy. The genre continues to explode however as each buddy cop movie is an original expression of the idea. Those original expressions are protected, not the idea.

During the training phase, the AI program analyzes the training materials for trends and correlations. In so doing, it extrapolates general principles which inform the final work. For example, for the next Rembrandt, the AI scanned Rembrandt's paintings to discern his style and techniques. To provide another example, the AI Jukedeck processes its training materials to discover music theory.[113] As can be seen, the insights that the AI draws from its training materials fall into the category of ideas, facts, and theories. As these are not relevant to copyright, it cannot be said that the authors of the training materials have authored the AI-generated work; the AI merely takes the ideas and forms

108. Telstra Corp.. v. Phone Directories Co.[2010] FCAFC 149.
109. Global Yellow, *supra* note 83.
110. *Telstra*, *supra* note 76.
111. *Id*. at 140.
112. *Id.* at 117.
113. *Jukedeck,* Jukedeck. [https://perma.cc/A7Y3-37E5]

its own original creative expression thereof.

VI. BACK TO AI AND GAMES: USERS OF INTERACTIVE AI: US LAW

Some AI is programmed to require or allow for human collaboration before a final work is generated. For example, the AI Jukedeck creates simple musical arrangements, which customers build onto to create more complex songs through the addition of instrumental tracks, vocals, and so on. [114] Or take for instance the film "It's No Game," in which an AI composed the dialogue for one of the characters while humans added stage directions, resulting in a single screenplay. [115] Yet another example relates to a computer program trained in the writing style of Jacqueline Susann, which helped to create the 1993 novel "Just This Once." The program wrote a substantial part of the prose and its programmer wrote the rest, producing one cohesive story.[116]

In such cases, the user is indeed an author as they have exercised intellectual skill and effort towards authorial creation. Their creative contributions were then combined with the AI's creations to form a single work. Hence, a human author can be identified, and copyright subsists in the work.

Nevertheless, this analysis is not devoid of problems. A court may find that copyright protection for the work is "thin"[117] i.e. not everything in the work is protected. To illustrate, a third party might copy the AI's contributions in its entirety, while copying only a small part of the user's contributions. As the AI's contributions do not have a legal author, a court may find that the third party is not liable for infringement. This would not be considered a joint work where each co-author's efforts are combined into a unitary whole. Rather, there is only one author and an AI, with distinguishable contributions.[118] This would be alarming, since the major selling point and unique proposition for such co-created work is often the *AI's* contributions. It is precisely the AI's output that companies don't want others to copy.

Next, absent any contract with user/gamer co-creators, the programmers and owners of the AI would not have any rights over the AI-generated work. This is because the user would be the only author, and by default, the owner of the copyrighted work. In such cases, there is still a lack of incentive for companies to invest in AI. However, in practice, it would be rare for companies to neglect to stipulate a contract with their users. We believe that it is more likely that a company will contract for a one-time fee or recurring royalty-like payments, enabling it to profit from its investment in the interactive AI.

---

114. Samuel Fishwick, *Robot rock: how AI singstars use machine learning to write harmonies* (Mar. 1, 2018), [https://perma.cc/A7Y3-37E5].

115. Lisa Brackmann, *Hasselhoff-bot stars in AI-scripted*, (Apr. 26, 2017), [https://perma.cc/5QF3-9SBW].

116. Denicola, *supra* note 74.

117. Global, *supra* note 83, at 8.

118. *See, e.g.*, Thomas Margoni & Mark Perry, *Ownership in a Complex Authorship: A Comparative Study of Joint Works in Copyright Law*, 34 EUR. INTELL. PROP. REV. 1, 22–32 (2012).

If the user is deemed the author of the AI-generated works, the user can transfer ownership of the copyright to the company that owns the AI by means of contract. This is consistent with the scheme of the Copyright Act and the holding in *Asia Pacific*.[119] The concern of a perpetual monopoly can be addressed by conceiving the user as the author, such that the duration of the subsistence of copyright will be defined by the user's lifespan. This may potentially allow for an AI to serve as a creator of copyrightable works under Singapore copyright law.

VII. THE WORK FOR HIRE DOCTRINE, A POTENTIAL LIFE SAVER?

While AI technology is rapidly expanding, it is clear that it has not hit the Singularity—the point at which digital computational power becomes equal to analog human computational power.[120] Whether or not this will happen in the next few years remains to be seen.[121] Some might argue that this is a fool's errand: until AI becomes more equal to humans in computational abilities, it might seem imprudent to determine whether or not they can be actual authors within the scope of copyright law. According to them, we should wait until we can better map the trajectory of AI.[122]

However, this wait-and-see method is problematic for the many industries that have begun to rely on the creativity of AI, such as the gaming industry and Hollywood. In these situations, copyright rules should provide at least a stopgap method to allow for the protection of AI-generated works, even though the AI may not be sufficiently advanced to be considered an author. This is especially necessary to prevent a chilling of innovation in AI creativity. Who would spend millions to develop an AI-based creative work, in the gaming industry or otherwise, if they cannot protect it?

As such, we propose that an understanding of the work for hire doctrine provides a valuable opportunity to create that stopgap without the unnecessary controversy of making AIs more people-like. This article is not the first to look to the work for hire doctrine as a potential solution.[123] Yet, our analysis goes further in establishing AIs as employees and in looking into the underlying mechanics of the work for hire doctrine.

---

119. *Supra* note 100.

120. Ray Kurzweil, The Singularity Is Near: When Humans Transcend Biology (2005).

121. *See id.* at 121(noting that the singularity is predicted to occur in approximately 2045 via a gradual rather than rapid ascent).

122. The White House's recent report on advancements in AI notes, "The Federal Government is investing in a considerable breadth and depth of innovative AI concepts that can transform the state of the field." 2016-2019 Progress Report: Advancing Artificial Intelligence R&D, November 2019 online at https://www.whitehouse.gov/wp-content/uploads/2019/11/AI-Research-and-Development-Progress-Report-2016-2019.pdf

123. *See, e.g.*, Shlomit Yanisky-Ravid, *Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era: The Human-like Authors are Already Here: A New Model*, Mich. St. L. Rev. 659 (2017); Annemarie Bridy, *The Evolution of Authorship: Work Made by Code*, 39 Colum. J. L. & Arts (2015).

In the U.S. version of the work for hire doctrine,[124] copyright rights could vest in third parties that employ AI, rather than in the AI itself. Others have attempted to appropriate the corporate authorship idea, as a way to claim that the US copyright already allows non-human actors —the corporate employers of employees that create creative work.

In our understanding of the work for hire doctrine, we don't need to stretch the bounds of copyright beyond human authorship to let in a group of AI authors. Rather, we can assume, as a legal fiction, or representative of reality (depending on whether you think an AI is hirable or not) all AI-based works are effectively works for hire. As we will explain under the work for hire doctrine, in many jurisdictions, while the hiree, here an AI, does not obtain copyright protection, those who employ the AI (e.g., the companies using an AI to create original works) do.[125] These work for hire employers are either the programmers that write the code or the employers of those programmers. While this is far from a perfect solution in the world of AI and copyright, it still allows AIs to create copyrightable works. Allowing AIs to create copyrightable works without being copyright authors kicks the authorship question down the road while answering the more imminent business question: can I protect my investment in works of authorship, if the author is an AI? Our answer is: often, yes. This is an important answer as it allows for further investment in AI creativity which will hopefully get us that much closer to the question that we kicked down the road.

Notably, our proposal may not work in all jurisdictions that have a work for hire doctrine, especially those that, unlike the US, do not explicitly grant the employer authorship. Singapore, for example, has a work for hire doctrine where the ownership of copyright often vests in the employer, but not the authorship itself. [126] Like the United States, Singapore allows for few, if any, moral rights claims to copyright, which can confound protections granted to AIs, where moral

---

124. *See, e.g.*, Sutherland Absill & Brennan LLP Analysis of International Work-for-Hire Laws 2004, online at https://us.eversheds-sutherland.com/portalresource/lookup/poid/Z1tOl9NPluKPtDNIqLMRV56Pab6TfzcRXncKbDtRr9tObDdEuS3Dr0!/fileUpload.name=/WorkforHireLaws.pdf

125. *See e.g.*, US Copyright Office, Works Made for Hire, Circular 9, https://www.copyright.gov/circs/circ09.pdf [hereinafter Works Made for Hire]. Most of the legally complicated aspects of this doctrine relate to whether a seemingly independent actor is in fact an employee under the doctrine creating a work for hire. *See, e.g.*, *Horror Inc. v. Miller*, 335 F. Supp. 3d 273 (D. Conn. 2018) (Agreeing that, "if a work is made for hire, the employer or other person for whom the work was prepared is the initial owner of the copyright unless both parties involved have signed a written agreement to the contrary").

126. "If you created the works during employment, your employer will automatically own the work. This applies to all employees, except for journalists … If you were paid under an agreement, for the creation of portrait, photograph or engraving, the person who commissioned or paid for the creation of these works will automatically own the copyright in those works. In short, the person who paid to create certain types of work would be the copyright owner. For all other types of works, ownership belongs to the commissioned party." https://www.ipos.gov.sg/about-ip/copyright/ownership-commercialisation; *See also* Intellectual Property Office of Singapore, *Copyright @ Work*, (2012), https://www.ipos.gov.sg/docs/default-source/resources-library/copyright/copyright_work-oct-2012.pdf

rights seem to make less sense.[127] But unlike the US, the Singaporean work for hire doctrine doesn't speak of employer authorship, but rather employer ownership. As we will see, this is a fundamental distinction. Moreover, as Singapore seems to remain adamantly against corporate authorship, it would seem unlikely that the law conflates the terms employer *ownership* with employer *authorship*, a necessary requirement if Singapore would actually allow the copyright authorship –and not just the copyright ownership-- of the AI's work to be granted to the corporate entity. Although this has not been tested in court and we are hopeful that if it is tested, the courts may consider our interpretation.

VIII. GETTING COPYRIGHT PROTECTION FOR AI FROM THE WORK FOR HIRE AND OTHER DOCTRINES THAT EXPAND THE AMBIT OF COPYRIGHT PROTECTIONS

The history of the formerly controversial United States' Work for Hire Doctrine[128] is valuable vis-a-vis assessing whether we can grant copyright works to AI-authored content, even while we are unsure how AI can be ever be an author.[129] Recall, if an unauthored work cannot be protected by copyright, it will fall to the public domain. And, if an AI cannot be an author, its work product cannot be protected by copyright, which requires an author. Like the economic push for the original work for hire doctrine, this current lack of protection for AI original content has created an increasing economic need for a copyright solution, especially as more advanced AIs join the workforce.

Succinctly, the American version of the work for hire doctrine vests legal *authorship* of a work in the employer of the employee who has created a copyrightable work, unless they specifically contract that the work not be deemed a work for hire, or the work is legally deemed not to be a work for hire, which is a non-trivial determination.[130] Indicative of the economic necessity of

127. Amendments to the Singapore Copyright laws were proposed in January of 2019 to include the rights of attribution, a moral right. *See, e.g.*, Ministry of Law, *Singapore Copyright Review – Enhancing Creators' Rights and Users' Access to Copyrighted Works* (Jan. 17, 2019), https://app.mlaw.gov.sg/news/press-releases/singapore-copyright-review-report-2019

128. Marci A. Hamilton, *Commissioned works as works made for hire under the 1976 Copyright Act: Misinterpretation and Injustice*, 135 U. PA. L. REV. 1281–1320 (1987). Work for hire was not included explicitly in the earlier 1909 Copyright Act, but the law did consider the situation; *See Martha Graham School and Dance Foundation, Inc. v. Martha Graham Center of Contemporary Dance, Inc.*, 380 F.3d 624, 634 (2d Cir. 2004). "The 1909 Act provides no definition of 'work made for hire,' but it states the consequence of that designation. "[T]he word 'author' shall include an employer in the case of works made for hire." 17 U.S.C. § 26 (repealed). Thus, with respect to works for hire, the employer is legally regarded as the "author," as distinguished from the creator of the work, whom Learned Hand referred to as "the 'author' in the colloquial sense." (citing *Shapiro, Bernstein & Co. v. Bryan*, 123 F.2d 697, 699 (2d Cir. 1941).

129. *See generally* Catherine L. Fisk, *Authors at work: The origins of the work-for-hire doctrine*. 15 Yale J. L. & Human 1 (2003); Ryan Vacca, *Work made for hire-Analyzing the multifactor balancing test*. 42 Fla. St. U. L. Rev. 197 (2014).

130. https://www.copyright.gov/circs/circ30.pdf (If a work is a work made for hire, the employer or the party that specially ordered or commissioned that work is the author of that work)

this doctrine which allowed corporations with huge creative staffs to create copyrightable works for the corporation, in the U.S., this legal fiction allows for the (at the time) novel idea that non-human corporate authors, such as the employer, need not be an actual person.[131] And as such, the work for hire doctrine opened up copyright to non-human authors.[132]

This understanding of the work for hire doctrine vis-à-vis AI is apropos. The history of the doctrine supports the notions underpinning the creative nature of an AI. This could provide further justification for granting the AI copyright authorship. In particular, Professor Catherine Fisk notes that the history of the doctrine coincides with an appreciation that "ideas are created socially; they are not 'out there' waiting to be uncovered, and they are not the product of one individual's solitary genius. They are produced because of the individual's experience and social context."[133] This construction would coincide well with the machine learning process described earlier, i.e., that an AI does not discover its creativity *ex nihilo* rather it collects ideas and information from training sets, that information, once processed, becomes the source for the AI's output.

The U.S. doctrine of work for hire goes further than most jurisdictions in wholly abandoning any possibility that the employee has any copyrights in their work product. The Second Circuit in *Carter v. Helmsley-Spear, Inc.*, ruled that the limited moral rights granted to authors under VARA[134] such as attribution and association with the work did not apply to works for hire. This further cemented the idea that the legal copyright author in a work for hire is wholly the employer.[135]

Granted the focus of this paper is principally on the US Copyright System, however, it should be noted that if we attempted to apply our theory in other regimes it might work if the jurisdictions applied similar rules in their interpretation of work for hire. Thus, in contrast to the U.S. and other common law jurisdictions, several civil law countries, such as Germany, China, and France, vest the ownership first in the employee, which then grants an implied limited license to the employer.[136] In these civil law countries, the law also vests

131. *See e.g.*, Fisk, *supra* note 130; I. Trotter Hardy, *An Economic Understanding of Copyright Law's Work-Made-for-Hire Doctrine,* 12 COLUM.-VLA J.L. & ARTS 181 (1988).

132. *See, e.g.*, Sean M. O'Connor, *Hired to Invent vs. Work Made for Hire: Resolving the Inconsistency among Rights of Corporate Personhood: Authorship, and Inventorship*, 35 SEATTLE U. L. REV. 1227 (2011).

133. Fisk, *supra* note 130.

134. Visual Artists Rights Act of 1990 (VARA or Act), Pub. L. No. 101-650 (tit. VI), 104 Stat. 5089, 5128-33 (1990); *See, e.g.*, Melissa Boyle, Stacy Nazzaro, & Debra O'Connor, *Moral Rights Protection for the Visual Arts*, 34 J. CULT. ECON. 27–44 (2010).; Peter H. Karlen, *What's Wrong With VARA: A Critique of Federal Moral Rights*, 15 HASTINGS COMM. & ENT. L. J 905 (1992).

135. 71 F.3d 77 (2d Cir. 1995).

136. Except in the case of software.

the moral rights[137] within the employee creator and not the employer.[138] However, our solution, which hinges on an AI being considered an employee within a work for hire scenario and not retaining any associated copyrights, will not work in these jurisdictions, as it requires the legal fiction that the employee never becomes neither the copyright owner nor author.

Regardless of the jurisdiction, the work for hire doctrine, like all areas of intellectual property, is principally an economics-driven allocation of property. And, in contrast to many other areas of IP, it is unabashedly so. Further, unlike most other forms of IP, the work for hire doctrine dispenses all pretense of romantic notions of authorship[139] or inventorship. The author is simply a legal fiction.[140] The law vests authorship in whomever (or whatever) has the money and control,[141] and can best achieve the policy goals of the constitution to promote the progress of useful arts,[142] i.e., the employer. The acknowledgment

---

137. *See, e.g.*, J.M. Besek, D.J. Gervais, M. Schultz, E.J. Schwartz. & K.T. Claggett, *Overview of Moral Rights*, 8 Geo. Mason J. Int'l Com. L. 6 (2016).

138. Sutherland Asbill & Brennan LLP, *Analysis of International Work-for-Hire Laws*, (2004).

139. The romantic ideology of authorship considers copyrightable works to have been produced by authors in process of "solitary, ex nihilo creation" Sources of this romantic nature are provided in Marc Perlman, *Meta-ideologies of Textuality: Authorship, Plagiarism, Copyright*, 7.2 Signs and Society 245–87 (2019); *See also* Peter Jaszi, *On the author effect: Contemporary copyright and collective creativity*, 10 CARDOZO ARTS & ENT. L. J. 293 (1991) (describing the history of the romantic notion of copyright authorship "Martha Woodmansee demonstrates that the Romantic notion of "author" handed down to us from the eighteenth century never has been particularly apt to the realities of the writing process." In what follows, I have sought to demonstrate how the persistence of the notion of "authorship" in American copyright law makes it difficult for any new legal synthesis, which would focus on the reality of collective creativity, to emerge.").

140. *See, e.g.*, Fisk, *supra* note 130 ("One significant exception to the law's disregard for the fiction of authorship is in the case of "works made for hire." Here, the Copyright Act expressly recognizes the author as a legal fiction. If a work meets the statutory definition of a work made for hire, "the employer or other person for whom the work was prepared is considered the author" for purposes of federal copyright law.").

141. *See, e.g.*, Nimmer & Nimmer, *Nimmer on Copyright* § 5.03[a], at 5-10 (1986) ("Section 201 of the Act makes the buyer the author and initial owner if the work was made for hire: …(b) Works Made for Hire — In the case of a work made for hire, the employer or other person for whom the work was prepared is considered the author for purposes of this title, and, unless the parties have expressly agreed otherwise in a written instrument signed by them, owns all of the rights comprised in the copyright.")

142. *See, e.g.*, *Brattleboro Publishing Co. v. Winmill Publishing Corp.*, 369 F.2d 565 (2d Cir. 1966) (noting that the employer is the "author" "whenever an employee's work is produced at the instance and expense of his employer."); *See also Siegel v. National Periodical Publications, Inc.*, 508 F.2d 909, 914 (2d Cir.1974) (noting that the work for hire doctrine is when the employee's work is produced at the instance and expense of the employer, or, in other words, when the "motivating factor in producing the work was the employer who induced the creation."); the Fifth Circuit summary: "almost irrebuttable presumption that any person who paid another to create a copyrightable work was the statutory "author" under the "work for hire" doctrine. This presumption could not be avoided even by showing that the buyer had no actual right to control the manner of the production of the work, because the buyer was thought to maintain the "right" to control simply by paying for the work and having the power to refuse to accept it. In other words, the class of persons who counted as "employees" under the copyright statute was far greater than the class of regular or formal employees, and well beyond the somewhat extended class of employees — known as "servants" — under agency law; Restatement (Second) of Agency § 220(1) (1958) ("A servant

of this legal fiction, already divorced from standard, anti-AI notions of authorship, allows us to stretch copyright to fit AIs into the model without having to grant them problematic authorship. And even though some have still found traces of the romantic authorship even within the work for hire doctrine,[143] our workaround, which finds a place for AI authors within the work for hire doctrine, allowing companies that employ AIs as creators to still achieve copyright (which demands that there be a discernible author) still stands: authorship doesn't vest in the actual worker specifically because it goes instead to the source of inspiration. That source is the employer, or, in other words, the romantic author.

According to this theory, the work for hire doctrine fits well with the Supreme Court's Feist decision that undid the sweat of the brow doctrine. How so? Sweat of the brow is a defunct Lockean copyright philosophy that put copyright into the hands of those who worked hard to achieve their end-products regardless of creativity or innovation, or lack thereof,[144] provided that copyright protection could be based not necessarily on creative authorship but simply on human mental exertion. Succinctly, according to the underlying theory of the sweat of the brow doctrine, if you put in the time and effort to create a work, say a phonebook, even though that phonebook is simply an alphabetical listing of names and phone numbers devoid of any creativity, the doctrine said you could still receive copyright protection[145]

The Feist decision ruled, however, that a putative author's exertion cannot be the only reason for granting copyright authorship and so, for example, factual information that is merely collected or compiled, but not the result of human creativity and inspiration, cannot be the work of a creative author, and as such is not copyrightable. [146]

If one considers the employee in the work for hire doctrine as simply the uncreative labor realizing someone else's vision, and not inspired by the author herself, then the work of that employee would not be copyrightable. It lacks the Feistian creative author. This hired author has only worked, she hasn't been creative. Work for hire solves this problem by finding the creative author in the employer.

Consider the extreme: completely mindless work for hire would not be

---

is a person employed to perform services in the affairs of another and who with respect to the physical conduct in the performance of the services is subject to the other's control or right to control.") (emphasis added). Whenever one person bought authorship services from another, the seller was a copyright "employee" and the buyer was a statutory "author." *Easter Seal Soc. v. Playboy Enterprises*, 815 F. 2d 323, 327(5th Cir. 1987).

143. Jaszi, *supra* note 140.

144. Alternatively known as "industrious collection," the court described it as" the underlying notion was that copyright was a reward for the hard work" *Feist Publications, Inc. v. Rural Telephone Service Co.,* 499 U.S. 340, 352 (1991).

145. *Id.*

146. *Id.* at 353. ("The "sweat of the brow" doctrine had numerous flaws, the most glaring being that it extended copyright protection in a compilation beyond selection and arrangement—the compiler's original contributions—to the facts themselves."); *id.* at 354 ("Without a doubt, the "sweat of the brow" doctrine flouted basic copyright principles.")

copyrightable, even if there was a creative output, if we relied on the employee to be the author. Under Feist, that worker cannot be the author, she was mindless in her creation, just following orders. As such, the work for hire doctrine has to find the author somewhere else in order to grant copyright. That somewhere else is the employer who creatively directs the employee. As such, while the person/employee that exerted herself might fail to gain authorship in the service of someone else, as per the later Feist decision, the employer, while not exerting herself per se, is granted the copyright authorship as the source of the creative inspiration for the employee. This is also seen in the law's rules for finding a work for hire in a freelancer's work: things like instructional text, translations, tests and answer materials for a test,[147] could arguably lack the necessary creativity to grant authorship to the freelancer, so the law grants authorship to the employer to preserve copyright in these work products.

Consider an AI employee in the work for hire model. Here too, we could argue that the current state of the art in AI does not allow for AIs to have their own desires or their own creativity; they merely follow their programming, even when making seemingly creative decisions. They rely on their programmer/owner/employer to provide inspiration and human creativity. However, this very argument that currently keeps AIs out of the world of copyright, claiming, for example, as described above, that AIs lack the human *je ne sais quoi* to be authors, could also provide the necessary theoretical underpinnings within the work for hire doctrine to have their programmer/employer granted the necessary authorship for copyright to vest in AI-created works and keep those works out of the public domain.

Even if our theory only holds water for a subset of actual work for hire cases—as there might be many cases where the employee can also provide the inspired creativity necessary for authorship under copyright law, yet the employer is still granted authorship—the underlying rules still work as work for hire is construed as a bright line rule, regardless of the creative nature of the employee[148] This legal fiction that every employee is not creative in their work for hire results in a necessary one size fits all rule. This fiction helps avoid confusion and spares judges and lawmakers from getting into the weeds every time they need to make a decision vis-à-vis work for hire. Notably, this is not the only bright-line rule associated with the doctrine.[149]

Of course, this aforementioned theory of romantic authorship supporting the granting of employer authorship need not even be viable to maintain the work for hire doctrine. Alternate theories of the doctrine will also support our

147. *See, e.g.*, Works Made for Hire; Hamilton, *supra* note 130.

148. This has been done in the past in the area of copyright, *see, e.g.*, John B. Fowles, *The Utility of a Bright-Line Rule in Copyright Law: Freeing Judges from Aesthetic Controversy and Conceptual Separability in* Leicester v. Warner Bros, 12 UCLA ENT. L. REV. 301 (2004).

149. *Easter Seal Soc. v. Playboy Enterprises*, 815 F.2d 323 (5th Cir. 1987) (finding that "[o]nly works by actual employees and independent contractors who fulfill the requirements of § 101(2) can be 'for hire'….")

hypothesis. We see other examples of where the law or the courts have moved away from the romantic ideas of authorship in favor of the more practical policy needs and legal fictions to expand the scope of copyright protection beyond the romanticization of authorship.[150]

In particular, the US Congress and the courts have, in other certain circumstances, expanded some of the protections granted via copyright legislation, regulation and jurisprudence to works that aren't even necessarily copyrighted per se. If the law can allow copyright protections in these cases, arguably similar economic necessities could allow for copyright protection for AI-created (but not authored) works.

For example, the Digital Millennium Copyright Act can be construed to provide copyright protections to non-copyrighted works under specific circumstances, especially databases that lost all but exceedingly thin copyright protection under the Feist ruling.[151]

Under the DMCA, there is a prohibition to circumvent digital protections such as encryption: "No person shall circumvent a technological measure that effectively controls access to a work protected under this title."[152] Although ostensibly limited to those digital protections that protect copyrightable works, very thinly copyrighted works, such as electronic databases[153], are also protected under the DMCA.[154]

Under the copyright law, both in the EU, even under the EU database directive,[155] and under US copyright law, vanishingly few aspects of databases

150. Like paracopyight protection for databases, even though databases lack the romantic author, they are simply compilations of facts, as discussed herein.

151. *See, e.g.*, *Feist*, 499 U.S. at 359-60 ("In summary, the 1976 revisions to the Copyright Act leave no doubt that originality, not 'sweat of the brow,' is the touchstone of copyright protection in directories and other fact-based works. Nor is there any doubt that the same was true under the 1909 Act. The 1976 revisions were a direct response to the Copyright Office's concern that many lower courts had misconstrued this basic principle, and Congress emphasized repeatedly that the purpose of the revisions was to clarify, not change, existing law. The revisions explain with painstaking clarity that copyright requires originality, § 102(a); that facts are never original, § 102(b); that the copyright in a compilation does not extend to the facts it contains, § 103(b); and that a compilation is copyrightable only to the extent that it features an original selection, coordination, or arrangement, § 101.") For further discussion as to how the DMCA expands copyright protection to include databases, *see, e.g.*, Dov S. Greenbaum, *Are We Legislating Away Our Scientific Future? The Database Debate*, 2 DUKE L. & TECH. REV. 1, 1-15 (2003); and Dov S. Greenbaum, *The Database Debate: In Support of an Inequitable Solution*, 13 ALB L. J. SCI. & TECH. 431 (2003).

152. 17 U.S.C. § 1201.

153. U.S. COPYRIGHT OFFICE, REPORT ON LEGAL PROTECTION FOR DATABASES 40-41 (1997).

154. Marshall Leaffer, *Database Protection in the United States is Alive and Well: Comments on Davison*, 57 CASE W. RES. L. REV. 855 (2006).

155. EUR COMM'N, SUMMARY REPORT OF THE PUBLIC CONSULTATION ON THE EVALUATION OF DIRECTIVE 96/9/EC ON THE LEGAL PROTECTION OF DATABASES (2017), https://ec.europa.eu/digital-single-market/en/news/summary-report-public-consultation-legal-protection-databases [https://perma.cc/27Q3-742X] ("The Database Directive (Directive 96/9/EC on the legal protection of databases, the 'Directive'), adopted in 1996, is part of the EU copyright acquis. It aimed to create a harmonized legal framework of ground rules for the protection of a wide

are still protected by copyright.[156] And the most valuable components thereof, the factual data, are clearly not protected. What is left for copyright protection are the relatively unimportant aspects of databases such as form or presentation.[157]

Nevertheless, these minimal components, under the DMCA, can cast a vast shadow of protection over the other non-copyrightable aspects of the database. The DMCA's rules allow that provided the database as a whole, including both the de minimis copyrighted aspects and the much larger uncopyrightable works, are protected by digital protections such as password protection, encryption and the like, then it is a copyright violation to access and copy that database. Furthermore, it is not only databases that have employed anticircumvention provisions of the DMCA to push even more works into the penumbra of copyright protection. Other non-copyrightable works have benefited from the para-copyright protections provided by the anticircumvention rules of the DMCA, often at the expense of the consumer [158]

Federal Copyright Preemption doctrine[159] is another area of copyright where the statute has expanded the scope of copyright law beyond the actual scope of protectable works. The Second Circuit, in a discussion of the scope of copyright protection, has noted that in order for a state law to be preempted by the federal copyright laws, the claimed work must involve a work "within the subject matter of copyright." [160] In *Forest Park*, the court, citing precedential rulings, noted "that works may fall within the subject matter of copyright, and

---

variety of databases while ensuring the legitimate interests of users to access information in database.").

156. Matej Myska & Jakub Harasta, *Less Is More? Protecting Databases in the EU after Ryanair* 10 Masaryk U. J. L. & TECH 170 (2016); *see also* Philip J. Cardinale, *Sui Generis Database Protection: Second Thoughts in the European Union and What It Means for the United States*, 6 CHI- KENT J. INTELL. PROP. 157 (2006) (discussion of European case law).

157. *See, e.g.*, *Feist*, 499 U.S. at 349 ("This inevitably means that the copyright in a factual compilation is thin. Notwithstanding a valid copyright, a subsequent compiler remains free to use the facts contained in another's publication to aid in preparing a competing work, so long as the competing work does not feature the same selection and arrangement. As one commentator explains it: '[N]o matter how much original authorship the work displays, the facts and ideas it exposes are free for the taking [T]he very same facts and ideas may be divorced from the context imposed by the author, and restated or reshuffled by second comers, even if the author was the first to discover the facts or to propose the ideas.'").

158. Katharine Trendacosta, *Reevaluating the DMCA 22 Years Later: Let's Think of the Users*, ELECTRONIC FRONTIER FOUNDATION (Feb. 12, 2020), https://www.eff.org/deeplinks/2020/02/reevaluating-dmca-22-years-later-lets-think-users [https://perma.cc/T98U-DMFF].; *See also* Dan L. Burk, *Anti-circumvention Misuse*, IEEE TECHNOLOGY AND SOCIETY MAGAZINE (Feb. 12, 2020) at 40-47 (finding the anti-circumvention provisions of the DMCA extend protection far beyond any exclusive right granted in the protected work. The anticircumvention allows exclusion that copyright clearly does not. The novel character of these rights, extending far beyond those in copyright, has caused some commentators to dub the anti-circumvention right as "paracopyright." Such "paracopyright" effectively grants copyright holders sweeping new ability to impose terms of access on content users.).

159. Preemption with Respect to Other Laws, 17 U.S.C. § 301.

160. *Forest Park Pictures v. Universal Television*, 683 F.3d 424, 429 (2d Cir. 2012) (citing 17 U.S.C. §301(a)).

thus be subject to pre-emption, even if they contain material that is uncopyrightable under section 102."[161] Clearly the court found a way to allow works that should otherwise fall within non-protected copyright subject matter, to still be able to gain from copyright law. This discordant and uneasy inclusion has been described as belonging to "the broad ambit of the subject matter categories." [162]

The Seventh Circuit explained that the purpose of this expansion of the area of copyright protection into non-copyrightable works, (e.g., outside the standard borders of actual statutory copyright protection), is so that Congressional intent can be achieved. Here that intent relates to federal pre-emption: "Section 301's preemption scheme functions properly only if the 'subject matter of copyright' includes all works of a *type* covered by sections 102 and 103, even if federal law does not afford protection to them." [163] This Congressional intent is paramount in the balance between federal and state law: "This ensures that state law cannot be used to make private that which Congress has decided should be in the public domain."[164] "In other words, even if works are not actually protected by copyright, if they are the types of works contemplated by copyright, state law cannot extend those works additional protection."[165] As such, pre-emption intentionally makes the 'wing of protection' broader.[166]

More recently, the Second Circuit reiterated this concept of the expansive nature of the broad ambit of copyright in another case: *Sammy Mourabit v. Steven Klein*.[167] Here, a makeup artist whose work, which was ultimately sketched out

---

161. *Id.*

162. *Briarpatch Ltd. v. Phoenix Pictures, Inc.*, 373 F.3d 296, 306 (2d Cir. 2004).

163. *ProCD, Inc. v. Zeidenberg*, 86 F.3d 1447, 1453 (7th Cir. 1996).

164. *We Shall Overcome Foundation v. Richmond Org. Inc.*, 221 F. Supp. 3d 396, 410 (S.D.N.Y. 2016).

165. *Thermotek, Inc. v. Orthoflex, Inc.*, No. 3:11-CV-0870-D, 2016 WL 4678888 at *5 (N.D. Tex. Sept. 7, 2016).

166. *See, e.g.*, *Spear Marketing, Incorporated v. Bancorpsouth Bank*, 791 F.3d 586, 596 (5th Cir. 2015) ("…*Nimmer* points to two policy justifications for this position: (1) Congress made a policy decision to exclude ideas from federal copyright protection, so 'state laws that protect fixed ideas trench upon' this deliberate exclusion; and (2) 'if ideas were deemed outside the "scope" of copyright protection—so that state laws protecting them could never be considered pre-empted—the result would be that state law could be used to protect . . . even those ideas embodied in published literary works'[…] The Fourth Circuit's explanation in *U.S. ex rel. Berge v. Board of Trustees of the University of Alabama* aligns with *Nimmer*. In noting that § 102(b) excludes ideas from protection but that § 301(a) preempts everything that falls within the scope of copyright, the court remarked simply that 'scope and protection are not synonyms.' It went on to observe that 'the shadow actually cast by the Act's preemption is notably broader than the wing of its protection.' The position of the majority of circuits clearly delineates between the purpose of federal copyright preemption and that of federal copyright protection. Congress intended the Copyright Act to protect some expressions but not others, and it wrote § 301(a) to ensure that the states did not undo this decision:

> [O]ne function of § 301(a) is to prevent states from giving special protection to works of authorship that Congress has decided should be in the public domain, which it can accomplish only if 'subject matter of copyright' includes all works of a type covered by sections 102 and 103, even if federal law does not afford protection to them.").

167. *Mourabit v. Klein*, No. 19-2142-cv, 2020 WL 3042131 (2d Cir. June 8, 2020).

on paper, ended up being distributed in photographs without content. Mourabit filed suit for copyright infringement and unjust enrichment and misappropriation. The lower court found that the Federal copyright law pre-empted the state claims of unjust enrichment and misappropriation. The appellate court ruled that it did not have to decide whether the infringed work was copyrightable, as Mourabit subsequently argued in attempt to save his state claims from preemption, rather only that the makeup work had to fit in with copyright in a "broad sense"[168] because the inherent scope of copyright preemption is actually "broader than the scope of copyrightable materials"[169] themselves. Here, the court found that Mourabit's work did fall within the "broad ambit" of copyright protection.[170] (Notably, a recent decision held that there was federal copyright protection in tattoos, even though they too were fixed in human skin as the tangible medium.)[171]

We argue that another area that fits into this ideal — the expansion of copyright protections beyond copyrightable works to achieve the intent of Congress— could be copyright protection for uncopyrightable AI works under the work for hire doctrine.

As described above, we need not reach, for this analysis, whether or not an AI can be deemed an employee within the colloquial sense of a legal person with rights and obligations. And, in any event, AIs have not yet been granted legal personhood in the vast majority of jurisdictions, although this is a highly contested area with significant support on either side.[172]

However, it is not clear that an AI must be a legal person to be an employee under US copyright law. In a 1989 US Supreme Court case, the Court noted that an employee in the world of copyright law is defined simply by its common-law agency law meaning[173] Providing 13 factors extracted from that meaning to be applied in a test to determine if an employee/employer relationship exists. That definition: "Under common-law rules, anyone who performs services for you is

168. *Id.* at *578 (citing *Briarpatch*, 373 F.3d at 305).

169. *Id.* at *577 (citing *Forest Park Pictures*, 683 F.3d at 429-30).

170. *Id.* at *578.

171. *Solid Oak Sketches, LLC v. 2K Games, Inc.,* No. 16-CV-724-LTS-SDA, 2016 WL 4126543 (S.D.N.Y. Mar. 26, 2020) ("Defendants annually release an updated basketball simulation video game that depicts basketball with realistic renderings of different National Basketball Association ('NBA') teams, including lifelike depictions of NBA players and their tattoos. Plaintiff alleges that Defendants have infringed its copyrights by publicly displaying works for which Plaintiff owns copyrights—five tattoos (the 'Tattoos') that are depicted on NBA players Eric Bledsoe, LeBron James, and Kenyon Martin (the 'Players')—in versions 2K14, 2K15, and 2K16 (released in 2013, 2014, and 2015, respectively) of Defendants' basketball simulation video game.") (citations omitted). Noticeably, the court goes through an entire fair use analysis without ever questioning first if the tattoos in question in the case were even copyrightable to begin with.

172. Ugo Pagallo, *Vital, Sophia, and Co.—The Quest for the Legal Personhood of Robots*, 9 INFORMATION 230 (2018); *See also* Dov Greenbaum, *Can a Golem Have a Birthday and Other Questions of Legal Personhood*, CALCALIST (Mar. 1, 2019), https://www.calcalistech.com/ctech/articles/0,7340,L-3757292,00.html [https://perma.cc/5EPE-AU68].

173. *Community for Creative Non-Violence v. Reid*, 490 US 730, 740 (1989).

your employee if you can control what will be done and how it will be done. This is so even when you give the employee freedom of action. *What matters is that you have the right to control the details of how the services are performed*."[174] (Emphasis added)[175]

While the court rejected placing any emphasis on a broad right to control,[176] it did allow for the determination of the right to control the manner and means by which the work is accomplished as potentially dispositive regarding employee status, [177] just not with the facts of that case. [178] The case also seemed to reject an earlier Ninth Circuit decision that required an employee "to mean someone working for an employer in a salaried job" which might exclude an AI.[179]

The Supreme Court later ruled that in fact the test for employee/employer relationship was very fact specific and no particular factor within the definition can be found to consistently be dispositive.[180] Subsequent courts have interpreted this further to require a balancing of all the factors.[181] And, that the *Reid* factors are non-exhaustive.[182]

Perhaps, in this case, in the balance, given the overwhelming extent to which the AI is under constant control of the corporation which owns the AI[183]

---

174. I.R.S., *Employee (Common-Law Employee)*, https://www.irs.gov/businesses/small-businesses-self-employed/employee-common-law-employee [https://perma.cc/39P8-TLNC].

175. *Hughes v. Twenty-First Century Fox, Inc.*, 304 F. Supp. 3d 429, 442 (S.D.N.Y. 2018) (citing *Reid*). The court extracted 13 factors from the common-law understanding of employee: Those factors include: (1) the hiring party's right to control the manner and means by which the product is accomplished; (2) the skill required; (3) the source of the instrumentalities and tools; (4) the location of the work; (5) the duration of the relationship between the parties; (6) whether the hiring party has the right to assign additional projects to the hired party; (7) the extent of the hired party's discretion over when and how long to work; (8) the method of payment; (9) the hired party's role in hiring and paying assistants; (10) whether the work is part of the regular business of the hiring party; (11) whether the hiring party is in business; (12) the provision of employee benefits; and (13) the tax treatment of the hired party.

176. *Reid*, at 750 "Transforming a commissioned work into a work by an employee on the basis of the hiring party's right to control, or actual control of, the work is inconsistent with the language, structure, and legislative history of the work for hire provisions."

177. *Id.*

178. *Id.* at 752 "But the extent of control the hiring party exercises over the details of the product is not dispositive. Indeed, all the other circumstances weigh heavily against finding an employment relationship."

179. *Id.* at 739 (seemingly rejecting *Dumas v. Gommerman*, 865 F. 2d 1093, 1099 (9th Cir. 1989)).

180. *Nationwide Mut. Ins. Co. v. Darden*, 503 U.S. 318, 324 (1992)" Since the common-law test contains "no shorthand formula or magic phrase that can be applied to find the answer, . . . all of the incidents of the relationship must be assessed and weighed with no one factor being decisive. (citations omitted).

181. *Knight v. State Univ. of N.Y. at Stony Brook*, 880 F.3d 636, 643 (2d Cir. 2018).

182. *Jones v. Royal Admin. Servs., Inc.*, 866 F.3d 1100, 1106 (9th Cir. 2017).

183. In other cases where the *Reid* factors are employed, "control" is granted special significance. *See Salamon v. Our Lady of Victory Hosp.*, 514 F.3d 217, 227 (2d Cir. 2008). *See also* "Yet while the right to control is indispensable to our analysis and bears more weight than any other single factor, that consideration alone "is not dispositive." *Garcia-Celestino v. Ruiz Harvesting, Inc.*, 898 F.3d 1110, 1119 (11th Cir. 2018). *See also id.* at 1121 "Because, as we have noted, control is the most important of these factors, we start with it." Further, common law control means: "control over the ends of the job, not the means of it." *Id.* And under the common law of agency,

or under control of the employee coder who herself is under the control of the corporation, then the AI is likely an employee, within at least the eyes of the copyright law.[184] For example, in a recent paper, Professor Diamantis makes the case that an algorithm ought to be treated by a corporation as an employee for liability purposes.[185] Elsewhere, Professor Diamantis has also made the case that an AI ought to be considered a fiduciary and has suggested it may be an employee under SEC regulations.[186] However, such scholarship is contradicted by the Restatement (Third) of Agency Law, that says software cannot be considered an agent: "[A] computer program is not capable of acting as a principal or an agent as defined by the common law. At present, computer programs are instrumentalities of the persons who use them. If a program malfunctions, even in ways unanticipated by its designer or user, the legal consequences for the person who uses it are no different than the consequences stemming from the malfunction of any other type of instrumentality. That a program may malfunction does not create capacity to act as a principal or an agent" [187] And, as per the restatement, an employee is just an agent "whose principal controls or has the right to control the manner and means of the agent's performance of work"[188] Notably, the Restatement was compiled in 2006 and specifically limits its wording to "at present." The extraordinary advance in AI research during the last 14 years might make the authors of the Restatement rethink this dated conclusion.

However, just because software cannot be an agent, perhaps it can be a legal person. And even if it can't be a legal person, we can make a distinction between legal persons and employees under the law. It is possible that an employee need not be a legal person with all the associated rights and obligations that come with personhood. For example, animals might be considered employees or laborers under emerging laws. There are long standing guidelines for animal welfare in film, governing, for example, the number of hours that animals may work each day and the amount of rest that should be given to animals on the film set.[189] In

---

we must focus on an entity's "control over the manner and means of the agent's performance and the details of the work" and ignore "mere economic control or control over the end result of the performance." *Id.* at 1122, differentiating many legal meanings of control.

184. The Southern District of New York seems to place substantial weight on first determining if the employee received any benefit from the employer. *Hughes supra* note 176 at 443. The metaphysical assessment as to whether an AI can gain 'benefits' is beyond the scope of this article.

185. Mihailis Diamantis, *Algorithms Acting Badly: A Solution from Corporate Law,* 89 GEO. WASH. L. REV. __ (forthcoming 2020). [https://perma.cc/9SKQ-L9SK]

186. John Lightbourne, *Algorithms & Fiduciaries: Existing and Proposed Regulatory Approaches to Artificially Intelligent Financial Planners*, 67 DUKE L. J. 651, 651 (2017). [https://perma.cc/Y2Q4-RSFT]

187. Restatement (Third) Of Agency, § 1.04 cmt. e (2006).

188. *See, e.g.*, Restatement (Third) of Agency §7.07 (discussing an "Employee Acting Within Scope of Employment").

189. *See, e.g.*, American Humane Association, *Guidelines for the Safe Use of Animals in Filmed Media* (2015) § 8-228 et seq. "The American Humane Association works with producers to facilitate safe, effective and efficient performances by animal actors. Your production will greatly

2008 the Supreme Court in Norway ruled that police dogs were akin to public servants and that an assault on a police dog was the equivalent of assaulting a human police officer. A 2013 case required the Nottingham Police provide their police dogs with a pension upon retiring.[190]

If work via AI is not considered a work-for-hire under copyright law, any copyright could potentially vest in the AI, provided that the AI could be a copyright author. This is an area that we have decidedly intended to avoid in this paper. But, using the work for-hire doctrine requirements, the situation where such a question might arise is unlikely with current technology as it requires the AI to be completely independent of a human master, and that the AI actually legally contracts that the work not to be a work for hire, So we must conclude, considering the current AI state of the art and current legal and social constraints, it would seem legally unlikely to see an AI as anything else than some form of employee under the work for hire doctrine rules.[191]

We aren't home free yet. Although we can assume that the AI is potentially an employee under the work for hire doctrine, it does not necessarily follow that the work is copyrightable, and that said copyright can vest in the employer. This is dependent on the mechanics of how our employer becomes the all-important author in a work for hire situation.

More specifically, the saving grace of work for hire doctrine granting the employer and not the employee authorship that we hang our AI copyrightability hat on would depend on whether the employer steps into the metaphorical shoes of the employee-author and obtains all the rights that employee author would have had, including the copyrights resulting from her original works of authorship. Alternatively, the mechanism of the work for hire doctrine might work to vest copyright in the employer simply because the employer becomes the author by nature of the statute as we hypothesized above, regardless of how the initial copyright grant would or would not vest. This is an important distinction to be made. If an AI cannot create copyrightable works, then there are no copyright shoes to step into. Whereas, if the employer does not need to step into shoes, then perhaps the employer does not actually even need the employee to create a fully copyrightable work per se (i.e., with a legal author) to have a copyrighted work for hire output.

A high school chemistry metaphor that we are all familiar with might be apt. Consider the sublimation of solid ice into a vaporous gas; the ice is the AI before it begins to do work and the vapor is the endpoint of copyright. There are

---

benefit from the American Humane Association's extensive experience meeting the unique needs of both animal actors and filmmakers." These guidelines have been codified in the Producer-Screen Actors Guild Agreement Since 1980 (P-SAG-AFTRA Agreement) [https://perma.cc/X4G5-5KZ4] [https://perma.cc/5QAC-C3FJ]

190. Charlotte E. Blattner, *Beyond the Goods/Resources Dichotomy: Animal Labor and Trade Law*, 22 J. INT'L WILDLIFE L. & POL'Y 63, 63-89 (2019). (Other examples are also provided herein, as well as an effort to define animal work as a service under Article I:3(b) of GATS).

191. Emad Abdel Rahim Dahiyat, *Law and software agents: Are they "Agents" by the way?* 29 ARTIF. INTELL. L. 59, 59-86 (2020).

two physical mechanisms by which ice can become vapor: a transformation from ice to liquid to vapor or a direct transformation from ice to vapor. More technically, ice can sublimate directly to the vapor without having to pass through the liquid stage. In the case of dry ice (the solid form of carbon dioxide), the phase transition actually skips the intermediate liquid stage. In most other cases, a solid cannot physically transform into a gas without first passing through the liquid phase. Barring those rare sublimation cases without a liquid phase a solid will likely never become a gas. Applying the metaphor, if the AI cannot be an author then there are no metaphorical shoes for the employer (human or corporate) to step into and obtain copyright authorship: meaning without a liquid phase the solid can likely never become a gas. Meaning that without a legitimate copyright author, the employer cannot obtain copyright *ab initio*. But, like in the rare case in which a solid subliminares directly into a gas and skips the liquid phase entirely, the copyright vests in the employer regardless of if the AI can be an author in the eyes of the law. The copyright skips the employee and goes straight to the employer.

An alternative theory. Under the work for hire doctrine, copyright can vest in the employer because the law is outcome dependent; the goal is to create a work where the copyright belongs to the employer regardless of the intermediate employee author, or lack thereof. As such, the employee's status is effectively unrelated to the vesting of authorship in the employer, and an AI that creates a work would be copyrighted under the work for hire doctrine. If the work for hire doctrine requires only that the outcome be a work that could have been copyrightable, (i.e., within the ambit of copyright) then even if an AI creates the work, the outcome is still a work that is potentially copyrightable, regardless of if it had not been done by an AI, and copyright finds the necessary authorship in the employer.

Or in the alternative, the copyright law may be process dependent. The law desires for the copyright to vest in the employer but it necessitates that the copyrighted work actually comes from an act of original authorship of an employee, and only then can there be a transfer of authorship to the employer. Under this understanding, the work for hire doctrine requires that first an employee through their actions creates a copyrightable work that could stand alone as a copyrighted work outside of the doctrine of work for hire, and only then can the employer simply step into the employee's shoes to take legal authorship. In this theory, the work for hire doctrine may not work if the putative author is an AI.

Problematically, if the latter is the case, arguably, the work for hire doctrine would have the opposite effect as the one we are aiming for. If all AIs are legally employees, and all AI works are works for hire then all AI work is uncopyrightable because the AI employee cannot be an author.

As such, we prefer the former theory where the work for hire doctrine provides for copyrightable works created by AI. The Compendium also seems to support this understanding. While the Copyright Compendium seems to clearly

close the door to AI created copyrightable works, it actually opens up a window for AI copyrighted works through the work for hire doctrine. The Compendium reads: "Because copyright law is limited to 'original intellectual conceptions of the author,' the Office will refuse to register a claim if it determines that a human being did not create the work."[192] There would seem to provide no opportunity for AI works to be copyrighted. However, the Compendium adds a citation to back up their position: *Burrow-Giles Lithographic Co. v. Sarony*.[193] Specifically, the court ruled there that "We entertain no doubt that the Constitution is broad enough to cover an act authorizing copyright of photographs, so far as they are representatives of original intellectual conceptions of the author."[194]

How does this help our case? As we described above, our theory underlying the novel granting of authorship to the employer and not the employee, is that the intellectual conception of the work belongs to the employer and not to the employee. As such, the Copyright Office's specific reliance on *Burrow-Giles*, in its description of work for hire would support our granting of copyright to the employers of AI, as the case discusses the specific need for human authorship as opposed to human creation. Put simply, under the work for hire doctrine, the AI is the creator, and the human is the author.

In contrast, the Commission on New Technological Uses of Copyrighted Works (CONTU) report, often employed to support the idea that AIs cannot create copyrighted works, focuses on computers as authors rather than as the separate entity of creators. [195]

In sum, the concept of a broad ambit of copyright law can provide copyright protection for those works that sit on the edge of copyright. Here, we apply the work for hire doctrine, wherein even if the work is beyond the scope of actual copyright protection per se, as the AI cannot be an author, it still falls within the broad ambit of copyright as the employer is the author and the owner of the copyright, even though that AI employee itself could not yet obtain copyright under current law.

IX. CONCLUSION

Artificial intelligence generated work presents complications on two levels when it comes to the attribution of ownership. The first problem encountered is with respect to deep learning techniques and the second problem is with respect

192. Compendium, *supra note* 48, §306.

193. *Burrow-Giles*, at 58.

194. Pamela Samuelson, *Allocating Ownership Rights in Computer-Generated Works*, 47 U. PITT. L. REV. 1185 (1986) ("CONTU regarded as too speculative to require serious consideration of the proposition that computers could or would soon be able to exhibit creative authorship. In CONTU's view, the computer was not and could not be 'the author' of anything"). [https://perma.cc/UM4K-4C8Y]

195. National Commission on New Technological Uses of Copyrighted Works (CONTU), *Final Report on the National Commission on New Technological Uses of Copyrighted Works*, 3 COMPUTER L. J. 53 (1981).

to attributing authorship to the AI generated works themselves.

With respect to the first issue, deep learning techniques such as neural networking, which is when the computer is being fed data from subsisting copyrighted works creates the possibility that an AI work is an infringing derivative work. This problem of infringement can easily be avoided by using works that are in the public domain, but this is less than optimal. The output that is obtained from neural networking software can always be improved if the input is improved. If programmers were to rely solely on works in the public domain, that would hinder development to a great degree. Unfortunately, what is developmentally better is also legally more complicated. While some works are available for use under open licenses, not all are. Sometimes copyrighted works will be needed as input.

The legal issue as to whether there is an infringement when a copyrighted work is used in the training stage of an AI remains unclear. This is especially because although that work will ultimately have some bearing on the AI's output, that output comes by way of opaque algorithms. It is not even clear whether the output is a derivative of the initial copyrighted work from which the AI learned or some sort of other legal extraction. This determination may be context dependent. Moreover, given the vast number of data points in a training set and the value of each individual point, each individual copyrighted work is *de minimis* with regard to the entire training. Thus, no one work can clearly show that the final AI work is a derivative work, and the use of the information may fall under fair use. Although, as is always the case, the cost of presenting a fair use defense as well as the chance of being found to not be a fair use, adds to the cost and uncertainty, which could impede AI innovation. Recently, a case regarding the replication of tattoos on National Basketball Association players with a video game was assessed.[196] Among other reasons, the district court found that the amount of time that the copyrighted tattoos would be present within a game was calculated to be extremely limited, and thus within the defense of fair use.[197] Given this *de minimis* nature, practically speaking, as this technology becomes better it is going to become harder for the original copyright holder to spot similarities with the original work, in turn making it harder to recognize any infringement. In addition, as the technology becomes more popular, the situation might develop similarly to how the illegal streaming industry is operating. In short, it will be an unregulated mess, a situation which is less than ideal both from the perspective of the economic incentive model and the moral rights model.

196. *Solid Oak Sketches, LLC v. 2K Games, Inc.*, 449 F. Supp. 3d 333 (S.D.N.Y. 2020).

197. *Id.* ("Court hereby declares that Defendants' use of the Tattoos in the challenged versions of their video game is de minimis and fair use and therefore does not infringe Plaintiff's copyrights." noting that "[t]o be substantially similar, the amount copied must be more than de minimis. to establish that the infringement of a copyright is de minimis, and therefore not actionable, the alleged infringer must demonstrate that the copying of the protected material is so trivial 'as to fall below the quantitative threshold of substantial similarity, which is always a required element of actionable copying").

The second problem encountered is with respect to attributing authorship to the AI-generated works themselves. There are several hurdles in considering AI-generated works as copyrightable, as has been amply demonstrated in the course of this paper. As complicated as this assessment may be, it is still preferable to granting no protection at all. To be clear, not granting copyright protection to AI-generated works is detrimental to many creative fields. Lack of copyright is a disincentive to fund projects related to AI development if the opportunity to commercially exploit the finished product is undercut. AI-generated works could be a huge draw in the coming years because of the novelty factor of a non-human being capable of creativity. As such, the opportunity to expand the work for hire doctrine to allow AI innovation without AI authorship, as we described herein, appears to be a good starting point, especially in jurisdictions like Singapore that have no current opportunity to allow for non-human authors.

Decidedly, assigning authorship of AI created works is extremely important since it influences the licensing and rights enforcement processes. Most of the problems that are faced in assigning authorship as well as granting copyright protection in cases of AI-generated works subsist because of the law's inability to quickly change with technological advances. The existing framework did not, and in all fairness could not have, anticipated the notion that machines would be able to generate creative productions. For the longest time, human beings were the only accepted sources of creativity. This idea has led to normative problems in the framework itself. We are no longer in a position where authorship conforms to the notions of creative decision making and originality. AI can now generate creative works, in a matter of minutes. However, as we don't yet appreciate the path that AI innovation will take, its arguably still too early to argue that AIs should be authors within the eyes of copyright law.

To this end our legal positions outlined in this paper are reinforced by the vast body of case law that goes on to define the requirements for copyrightability. While a normative redefinition would be desirable, it is unlikely until we have a better appreciation of how human AIs can be.

Until such a time, globally the work for hire doctrine might allow for AI authors to create copyrightable works even though the AI themselves cannot be legally construed to be authors. Still, it is understandable that the degree of protection granted to these works should be different relative to the protection extended to human-created works, because of the changing nature of the creative process in case of AI generated works, therefore, the primary responsibility to amend the law so that it retains the basic essence of the goals of the copyright framework falls on legislatures. Until then, we can only act based on assumed intent of how far legislators want to extend the ambit of copyright protection beyond copyright protectable works. AI is already being used, and successfully used at that, to generate artistic and musical works. With the recent inroads that have been made into the development of Artificial Intelligence, this question becomes even more pertinent and should be conclusively answered. It just does not have to be answered today.