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ARTIFICIAL CREATIVITY?

A CASE AGAINST COPYRIGHT PROTECTION FOR AI-GENERATED WORKS

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Abstract

Today, many areas of our daily lives are determined by artificial intelligence (AI). Machines program software, translate texts rapidly, create beautiful images, and design fashion efficiently. They are capable of superhuman performances. Furthermore, machines make the impression of boundless creativity. AI's achievements in traditional areas of copyright subject matters inevitably raise the question of legal protection through an exclusive right. This Article begins by exploring AI technology's various accomplishments (Introduction). Then, in Part I, it outlines the legal status quo with respect to those developments. And Part II discusses potential copyright protection, mainly from the perspective of creativity. Finally, Part III, IV, and V address other arguments regarding copyright protection for AI products, such as the economic aspects of incentive and market failure. This Article contemplates the issue from an international perspective and concludes that neither copyright nor other similar protection rights, i.e. sui generis rights (which already exist for different subject matters, for example, in Europe), should be implemented. This finding holds true regardless of the legal jurisdiction, may it be common law or civil law.

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Introduction: AI's Importance and Achievements

The term "Artificial Intelligence" (AI) encompasses a broad scope of technologies.[1] "Machine learning" often falls under AI and refers to self-learning algorithms. Machine learning technology learns from a large number of example cases and abstracts a general rule from them. After a learning phase, these findings can then be applied to other cases. Thus, machine learning software can independently and continuously improve its processes by observing and evaluating input by people or occurrences or by self-observation. Self-learning algorithms have been in place and utilized since the 1960s. At that time, there existed already a painting machine and a translation robot used by the American Air Force.[2] However, there is now much more computing power available, allowing these algorithms to improve.[3] In addition to machine learning technology, there are also artificial neural networks (ANN), which are modeled after natural neural networks and sometimes achieve even better results than machine learning.

The tremendous computing power explains the rapid increase in AI's relevance. Nowadays, intelligent machines play a major role in many areas of our daily lives. For example, AI machines program software, translate texts, create images, compose music, and design fashion, in addition to performing a myriad of other tasks ranging in difficulty and complexity. As a result, significant economic interests are at stake. Worldwide, AI-generated revenue is estimated

[1] *See* Shlomit Yanisky-Ravid, *Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era—The Human-Like Authors Are Already Here—A New Model*, 2017 MICH. ST. L. REV. 659, 673–76 (2017) (discussing the difficulty of finding a definition and outlining the possible approaches to defining "Artificial Intelligence"); Atilla Kasap, *Copyright and Creative Artificial Intelligence (AI) Systems: A Twenty-First Century Approach to Authorship of AI-Generated Works in the United States*, 19 WAKE FOREST J. BUS. & INTELL. PROP. L. 335, 339–42 (2019).

[2] Friedrich Karl Fromm, *Der Apparat als geistiger Schöpfer*, GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT 304, 304–05 (1964) (Ger.).

[3] *See* Ryan Calo, *Artificial Intelligence Policy: A Primer and Roadmap*, 51 U.C. DAVIS L. REV. 399, 402 (2017) ("[A] vast increase in computational power and access to training data has led to practical breakthroughs in machine learning . . . ."); Daryl Lim, *AI & IP: Innovation & Creativity in an Age of Accelerated Change*, 52 AKRON L. REV. 813, 827 (2018) ("[C]omputer processors attained the miniaturization, sophistication, and power needed for AI to take off.").

to grow from nearly $8 billion in 2016 to more than $47 billion in 2020.[4] And by 2025, AI-generated revenue is estimated to be up to $126 billion.[5]

This Article cannot expound all of AI's various achievements. Three examples of AI's success in typically copyright-related areas, however, shall be singled out and discussed for the purposes of this Article.

In a project called "You Can't Know My Mind" in 2013, an AI software painted portraits of people, whereby it employed styles depending on its "mood."[6] That "mood" depended on whether the reports in the local daily newspapers were positive or negative. Once, the program even refused to paint at all because of its negative "sentiments."

An even more famous example is the project "The Next Rembrandt"—a collaboration of different institutions that created a painting in Rembrandt's style.[7] Experts from various fields collected data by examining the works of Rembrandt for characteristics and compiled them in a database. The data were collected by means of 3D scans and face recognition software. Subsequently, they determined the subject of the new picture.[8] With this profile, the developers began to extract characteristics from all images that matched the profile. With their findings on a typical "Rembrandt face," they created a new painting using a 3D printer. The final work consists of 148 million pixels and is based on 168,263 fragments of Rembrandt's paintings.

In 2016, SONY CSL Research Lab developed Flow Machines, an AI system that composes new tunes by exploiting a huge database of songs.[9] This program created, for instance, the melody of "Daddy's Car" in the style of The Beatles.[10]

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[4] KAY FIRTH-BUTTERFIELD & YOON CHAE, WORLD ECON. F. CTR. FOR THE FOURTH INDUS. REVOLUTION, ARTIFICIAL INTELLIGENCE COLLIDES WITH PATENT LAW 5 (2018), http://www3.weforum.org/docs/WEF_48540_WP_End_of_Innovation_Protecting_Patent_Law.pdf.

[5] Shanhong Liu, *Revenues From the Artificial Intelligence (AI) Software Market Worldwide From 2018 to 2025*, STATISTA (Nov. 2020), https://www.statista.com/statistics/607716/worldwide-artificial-intelligence-market-revenues/.

[6] Madeleine de Cock Buning, *Autonomous Intelligent Systems as Creative Agents Under the EU Framework for Intellectual Property*, 7 EUR. J. RISK REG. 310, 313 (2016). For more information on that project, see also Simon Colton, *The Painting Fool*, http://www.thepaintingfool.com/galleries/you_cant_know_my_mind/ (last visited Nov. 29, 2020).

[7] ING, *The Next Rembrandt*, THE NEXT REMBRANDT, https://www.nextrembrandt.com/ (last visited Nov. 29, 2020); *see also* The Next Rembrandt, *The Next Rembrandt*, YOUTUBE (Apr. 5, 2016), https://www.youtube.com/watch?v=IuygOYZ1Ngo; Mark Brown, *'New Rembrandt' to Be Unveiled in Amsterdam*, GUARDIAN (Apr. 5, 2016), https://www.theguardian.com/artanddesign/2016/apr/05/new-rembrandt-to-be-unveiled-in-amsterdam; Yanisky-Ravid, *supra* note 1, at 663–64.

[8] A high percentage of Rembrandt's opus were portraits. The Next Rembrandt, *supra* note 7. The most common matches revealed the following characteristics for the subject of the picture: portrait of a Caucasian man with facial hair, age 30 to 40 years, dark clothes with collar, hat-wearer, head turned to the right. *Id.*

[9] *See* Sony CSL, *Daddy's Car: A Song Composed by Artificial Intelligence—In the Style of the Beatles*, YOUTUBE (Sep. 9, 2016), https://www.youtube.com/watch?v=LSHZ_b05W7o.

[10] *Id.*

Even though those outcomes might create an impression of creative work at first sight, this Article will show that there are still significant differences between artificial and natural intelligences, notably in that AI is not capable of creative thinking. Hence, AI's work does not qualify for copyright protection.

I. Anthropocentric Copyright

Despite all the variations in the world's multitude of copyright regimes, a common thread emerges: copyright is based on an anthropocentric perspective. Authors are considered to be human. In the United States, this has always been the courts' understanding of the U.S. Constitution's wording: "By securing for limited Times to Authors . . . the exclusive Right to their respective Writings."[11] Recently, in a widely noted decision, the U.S. Court of Appeals for the Ninth Circuit dismissed a copyright infringement claim brought by an institution on behalf of a monkey that sought to assert rights in a self-clicked photograph, thereby affirming authorship as a right exclusive to humans.[12] Furthermore, the U.S. Copyright Office requires human authorship[13] and "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."[14] Hence, the proposition that the U.S. Copyright Act does not require human authorship, as some proponents of copyright protection for AI products contend,[15] appears to be a

[11] U.S. CONST. art I, § 8, cl. 8; *see, e.g.*, Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53, 61 (1884) ("[A]nd Lord Justice BOWEN says that photography is to be treated for the purposes of the act as an art, and the author is the man who really represents, creates, or gives effect to the idea, fancy, or imagination."); Urantia Found. v. Maaherra, 114 F.3d 955, 958 (9th Cir. 1997) ("[S]ome element of human creativity must have occurred in order for the Book to be copyrightable."); Kelley v. Chi. Park Dist., 635 F.3d 290, 304 (7th Cir. 2011) ("Authors of copyrightable works must be human; works owing their form to the forces of nature cannot be copyrighted.").

[12] Naruto v. Slater, 888 F.3d 418, 420 (9th Cir. 2018) ("[W]e conclude that this monkey—and all animals, since they are not human—lacks statutory standing under the Copyright Act."); *id.* at 426 ("17 U.S.C. §§ 101, 201, 203, 304. . . . § 203(a)(2)(A). The terms 'children,' 'grandchildren,' 'legitimate,' 'widow,' and 'widower' [in those provisions] all imply humanity and necessarily exclude animals . . . ."). *Contra* Victor M. Palace, Note, *What If Artificial Intelligence Wrote This? Artificial Intelligence and Copyright Law*, 71 FLA. L. REV. 217, 226 (2019) (asserting that this judgment has no impact on AI as this technology was not subject to this case).

[13] U.S. COPYRIGHT OFF., COMPENDIUM OF U.S. COPYRIGHT OFFICE PRACTICES § 306 (3d ed. 2017), https://www.copyright.gov/comp3/chap300/ch300-copyrightable-authorship.pdf ("The U.S. Copyright Office will register an original work of authorship, provided that the work was created by a human being.").

[14] *Id.* § 313.2. The registration with the Copyright Office is governed by 17 U.S.C. §§ 408–12. In general, copyright protection does not presuppose registration of a work. No civil action for infringement of a U.S. work, however, will succeed without application for registration. 17 U.S.C. § 411(a).

[15] *See* Annemarie Bridy, *Coding Creativity: Copyright and the Artificially Intelligent Author*, 2012 STAN. TECH. L. REV. 5 ¶ 49 (2012) ("Because copyright law does not expressly require human authorship, artificially intelligent computer programs that autonomously generate art need not be relegated for copyright purposes to scare-quoted authorship; their works can be regarded as proper 'works of authorship' under § 102 of the Copyright Act by virtue of their nexus to human creativity."); Annemarie Bridy, *The Evolution of Authorship: Work Made by Code*, 39 COLUM. J.L. & ARTS 395, 399 (2016) ("The Copyright Act doesn't say anywhere that an author has to [sic] human . . . ."); *see also* Margot E. Kaminski, *Authorship, Disrupted: AI Authors in Copyright and First Amendment Law*, 51 UC DAVIS L. REV. 589, 603 (2017) ("[T]he U.S. copyright system has already moved far enough away from romantic authorship for algorithmic authorship . . . ."); Yanisky-Ravid, *supra* note 1, at 718–19 ("It is not clear whether the U.S. Copyright Act itself explicitly requires the author of a creative work to be a human.").

minority view, not founded in case law or legal practice.[16] It is clear that Congress did not intend to grant intellectual property rights to machines.[17] The situation is even more unambiguous in Europe, where works are described as an "author's own intellectual creation." The European Directive on computer programs stipulates that a "computer program shall be protected if it is original in the sense that it is the author's own intellectual creation. No other criteria shall be applied to determine its eligibility for protection."[18] The directive on databases as well as a directive on certain copyright aspects contain the same provision.[19] Recital 16 of the latter directive further clarifies that a "photographic work . . . is to be considered original if it is the author's own intellectual creation reflecting his personality, no other criteria such as merit or purpose being taken into account."[20] Based on these provisions, the European Court of Justice (ECJ) unified the protection requirements for all works, characterizing a work as an "author's own intellectual creation"[21] and explaining that "the author . . . can stamp the work created with his 'personal touch,'"[22] thereby implying human authorship as a prerequisite.[23] This position corresponds with the legal status quo in Switzerland[24] as well as, for example, the prevailing

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[16] James Grimmelmann, *There's No Such Thing As a Computer-Authored Work—And It's a Good Thing, Too*, 39 COLUM. J.L. & ARTS 403, 403 (2016) ("[Computer-authored works] don't exist. Copyright law doesn't recognize computer programs as authors, and it shouldn't."); Tim W. Dornis, *Artificial Creativity: Emergent Works and the Void in Current Copyright Doctrine*, 22 YALE J.L. & TECH. 1, 20 (2020) ("U.S. copyright . . . is still based on the concept of a natural person being the author or creator and, accordingly, the right-holder."); Daniel J. Gervais, *The Machine as Author*, 105 IOWA L. REV. 2053, 2068 (2020) ("As applied by courts, originality requires *human* authorship.").

[17] Pamela Samuelson, *Allocating Ownership Rights in Computer-Generated Works*, 47 U. PITT. L. REV. 1185, 1199 (1986) ("[I]t is still fair to say that it was not within Congress' contemplation to grant intellectual property rights to machines. In the long history of the copyright system, rights have been allocated only to humans.").

[18] Directive 2009/24, of the European Parliament and of the Council of 23 April 2009 on the Legal Protection of Computer Programs, art. 1 ¶ 3, 2009 O.J. (L 111) 16, 18 (EC).

[19] Directive 96/9, of the European Parliament and of the Council of 11 March 1996 on the Legal Protection of Databases, art. 3 ¶ 1, 1996 O.J. (L 77) 20, 25 (EC) ("In accordance with this Directive, databases which, by reason of the selection or arrangement of their contents, constitute the author's own intellectual creation shall be protected as such by copyright. No other criteria shall be applied to determine their eligibility for that protection."); Directive 2006/116, of the European Parliament and of the Council of 12 December 2006 on the Term of Protection of Copyright and Certain Related Rights, art. 6, 2006 O.J. (L 372) 12, 14 (EC) ("Photographs which are original in the sense that they are the author's own intellectual creation shall be protected . . . . No other criteria shall be applied to determine their eligibility for protection.").

[20] Directive 2006/116, *supra* note 19, at 13 ¶ 16.

[21] Case C-5/08, Infopaq Int'l A/S v. Danske Dagblades Forening, 2009 E.C.R. I-6624, ¶¶ 35–38.

[22] Case C-145/10, Painer v. Standard VerlagsGmbH, 2011 E.C.R. I-12594, ¶ 92; *see also* Case C-604/10, Football Dataco Ltd. v. Yahoo! UK Ltd., ECLI:EU:C:2012:115, ¶ 38 (Mar. 1, 2012) ("[The] criterion of originality is satisfied when, through the selection or arrangement of the data which it contains, its author expresses his creative ability in an original manner by making free and creative choices . . . and thus stamps his 'personal touch'.").

[23] de Cock Buning, *supra* note 6, at 314; Jani Ihalainen, *Computer Creativity: Artificial Intelligence and Copyright*, 13 J. INTELL. PROP. L. & PRAC. 724, 727 (2018).

[24] *See* URHEBERRECHTSGESETZ [URG] [COPYRIGHT ACT], Oct. 9, 1992, AS 1798 (1993), art. 6 (Switz.) ("The natural person who has created a work shall be deemed the author."); *see also* Tim Rohner, *Der Schutz von KI-Schöpfungen im schweizerischen Urheberrecht*, 11 INTELL. PROP. J. 33, 53–69 (2019) (Ger.); Daniel Schönberger, *Deep Copyright: Up- and Downstream Questions Related to Artificial Intelligence (AI) and Machine Learning (ML)*, 10 INTELL. PROP. J. 35, 45 (2018).

view in Australia[25] and Japan.[26] Moreover, the Berne Convention, the oldest international agreement governing copyright, implies that human authorship is necessary for copyright protection.[27] The World Intellectual Property Organization (WIPO), while discussing a Model Copyright Law, considered including "computer-produced works" in that model law,[28] but never actually implemented it. Additionally, many jurisdictions deny patent protection to non-human creators as well. Both the U.S. Patent and Trademark Office (USPTO) and the European Patent Office (EPO) refuse to accept a machine as an inventor, the latter invoking an internationally applicable standard of inventors being natural persons referring, inter alia, to the U.S. Court of Appeals for the Federal Circuit as wells as the patent offices of China, Japan, Korea, and the USA.[29]

Under this approach, AI-created works remain unprotected because the outcome stems from such an independent process that it cannot be attributed to any human being. As the algorithms improve and refine themselves, the "Human Behind the Machine" is moving more and more into the background as the AI software is operating more and more independently.[30] Whether a work

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[25] *Cf. Acohs Pty Ltd v Ucorp Pty Ltd* [2010] FCA 577 (10 June 2010) 66 (Austl.) (holding that source codes generated by software were not original works by authors of software and thus not protected by copyright laws); *Telstra Corp. v Phone Directories Co Pty* [2010] FCA 44 (8 February 2010) 102 (Austl.), *aff'd*, [2010] FCAFC 149 (15 December 2010) (denying copyright protection in a work of which "substantial parts . . . do not have human authors . . . , are automated to the extent that human involvement is minor . . . , or have authors who cannot be ascertained . . . ."); *see also* Ihalainen, *supra* note 23, at 726 ("Australian legislation . . . doubts the existence of copyright in works created by AI, even with human input.").

[26] *See* Takashi B. Yamamoto, *AI Created Works and Copyright*, 48 PATS. & LICENSING, no. 1, 2018, at 1, 3, https://www.itlaw.jp/AIp.
20Created%20Works%20and%20Copyright.pdf ("The critical requirement 'creativity' here is construed by the court cases that the personality of an author is revealed in expression in any way. Accordingly, only human created works may fall within the protectable works.").

[27] *See* Jane C. Ginsburg, *People Not Machines: Authorship and What It Means in the Berne Convention*, 49 INT'L REV. INTELL. PROP. & COMPETITION L. 131, 134–35 (2018) ("[B]ecause lack of human authorship would disqualify such outputs from Berne subject matter under Art. 2, other Berne members incur no obligation to protect purely computer-generated works even if their countries of origin choose to cover them by copyright."). For example, Art. 3 of the Berne Convention for the Protection of Literary and Artistic Works of Sept. 9, 1886, last amended on Sept. 28, 1979, deals with nationality and habitual residence, neither of which would apply to an AI author.

[28] WORLD INTELL. PROP. ORG., COPYRIGHT: MONTHLY REVIEW OF THE WORLD INTELLECTUAL PROPERTY ORGANIZATION (WIPO), at 258 (1990),
https://www.wipo.int/edocs/pubdocs/en/copyright/120/wipo_pub_120_1990_09.pdf.

[29] *See In re* Application of Flashpoint IP Ltd., No. 16/524,350 (U.S.P.T.O. July 29, 2019),
https://www.uspto.gov/sites/default/files/documents/16524350_22apr2020.pdf?utm_campaign=subscriptioncenter&utm_content=&utm_medium=email&utm_name=&utm_source=govdelivery&utm_term=; *see also* European Pat. Off., *Grounds for the EPO Decision of 27 January 2020 on EP 18 275 174* (Jan. 27, 2020), ¶ 30,
https://register.epo.org/application?documentId=E4B63OBI2076498&number=EP18275174&lng=en&npl=false (referring to Univ. of Utah v. Max-Planck-Gesellschaft, 734 F.3d 1315, 1323 (Fed. Cir. 2013)). For a further discussion on the EPO decision, see Martin Stierle, *Artificial Intelligence Designated as Inventor – An Analysis of the Recent EPO Case Law*, 69 GRUR INT'L: J. EUROPEAN & INT'L IP L. 918 (2020).

[30] Rohner, *supra* note 24, at 52; *see also* Ginsburg, *supra* note 27, at 133–34. ("[H]uman users do not contribute sufficient 'intellectual creation' to meet minimum standards of authorship under the Berne Convention. Offline, merely giving a command does not make one an 'author': Pope Julius II may have commissioned the painting of the ceiling of the Sistine Chapel; from a Berne perspective (at the very least), the author of the frescos remains

created with the help of AI as a "computer-assisted work" is protectable depends, roughly speaking, on whether AI was only employed as a tool for implementing human decisions or acted independently.[31]

At the top of the list of countries taking the opposite approach is the United Kingdom, which provides for the protection of "computer generated works," that is, works that are "generated by computer in circumstances such that there is no human author of the work."[32] South Africa,[33] New Zealand,[34] Ireland,[35] and India[36] also follow this standard. The first country to protect computer-generated works, the United Kingdom, had already assumed, at the end of the 1980s,

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Michelangelo."); Dornis, *supra* note 16, at 8 ("[T]he AI's actual functions, operation, and productive output are determined entirely by its acquired capacities. With such an alteration of the process comes a loss of predictability, and AI autonomy ensues."); Palace, *supra* note 12, at 236 ("Thus, [the user, programmer, and company] would be rewarded despite not contributing to the intellectual conception of the work, contrary to the purpose of copyright law."); Robert Yu, Comment, *The Machine Author: What Level of Copyright Protection Is Appropriate for Fully Independent Computer-generated Works?*, 165 U. PA. L. REV. 1245, 1258–59 (2017) (explaining that a machine-generated work is neither a derivate work of the AI software since the work is not predicated on the previous work nor the end-user's creation since the end-user does not determine composition or arrangement); Gervais, *supra* note 16, at 2070 ("The automated decision-making feature of deep learning machines . . . adds unpredictability—but not randomness—and in doing so it breaks the causal link between humans . . . and the output.").

[31] Kalin Hristov, *Artificial Intelligence and the Copyright Dilemma*, 57 IDEA 431, 435 (2017) ("In this category [of AI programs with the direct guidance, assistance or input of human beings], AI is used as a tool to achieve a determined or predicted goal or outcome. An example may be the creation of a painting by an artist who has selected the colors, tool type . . . and has to some extent input his requirements into the AI algorithm used to create the work."); Dornis, *supra* note 16, at 7, 22 ("[A] distinction is required as to whether it merely functions as a tool or instrument of the human actor's creativity, or whether the human actor has given up control over both the production process and its outcome."); *see generally* Jane Ginsburg & Luke Ali Budiardjo, *Authors and Machines*, 34 BERKELEY TECH. L.J. 343 (2019).

[32] Copyright, Designs and Patents Act 1988, c. 48, § 178 (UK). According to the High Court of England and Wales (High Court of Justice), composite screen frames, generated by a computer program, of a coin operated video game are computer-generated works because the software built up composite images by overlaying the digital image of a pool table with images of the balls and cue. *See* Nova Productions v. Mazooma Games, [2006] EWHC 24 (Ch) (UK). With respect to authorship, § 9(3) reads: "In the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken." *Id.* And the scope of protection is somewhat limited by excluding computer-generated works from moral rights and shortening the duration of copyright. *See* Copyright, Designs, and Patents Act 1988, c. 48 §§ 12(7), 79(2), 81(2).

[33] Copyright Act 98 of 1978 § 1(h) (S. Afr.) ("In this Act, unless the context otherwise indicates, 'author', in relation to a literary, dramatic, musical or artistic work or computer program which is computer-generated, means the person by whom the arrangements necessary for the creation of the work were undertaken [[A]dded by s. 1 (d) of Act No. 125 of 1992].").

[34] Copyright Act 1994, ss 2, 5(2)(a) (N.Z.) (stating that "the person who creates a work shall be taken to be in the case of a literary, dramatic, musical, or artistic work that is computer-generated, the person by whom the arrangements necessary for the creation of the work are undertaken").

[35] Copyright and Related Rights Act 2000 (Act. No. 28/2000) (Ir.), Part I, § 2, § 21(f), http://www.irishstatutebook.ie/eli/2000/act/28/enacted/en/html (stating that an "'author' means the person who creates a work and includes in the case of a work which is computer-generated, the person by whom the arrangements necessary for the creation of the work are undertaken").

[36] Indian Copyright Act, 1957, § 2(d)(vi) ("'[A]uthor' means, in relation to any literary, dramatic, musical or artistic work which is computer-generated, the person who causes the work to be created.").

that "the far-sighted incorporation of computer-generated works in [its] copyright system will allow investment in artificial intelligence systems, in the future, to be made with confidence."[37]

On December 24, 2019, a Chinese court conferred copyright protection on an AI-written text.[38] However, it did so without relying on the fact of pure machine creation. Instead, it based its reasoning on the fact that the prerequisite of "intellectual creation" under Chinese copyright law was met by means of human involvement to a certain—albeit small—extent through determining, among other things, selection and arrangement.[39] Thus, at least in this court's view, the case did not concern a work entirely created by AI.[40]

Contemplating both national jurisdictions as well as international law, it becomes clear that copyright law is designed to be anthropocentric, admittedly with the exception of computer-generated works in a few countries. Proponents of exclusive rights for AI products either urge the United States to follow their example and join the United Kingdom,[41] or propose to apply the work-made-for-hire doctrine,[42] considering the AI technology to be its programmer's or user's employee.[43] However, postulating such a flexible definition of "employer" and "employee" in the U.S. Copyright Act's definition of "work made for hire"[44] blatantly conflicts with the U.S. Supreme Court's holding that the term "employee" must be interpreted in accordance with agency law.[45] It should be generally and internationally recognized that machines are owned, not employed.[46]

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[37] HL Deb (12 Nov. 1987) (489) col. 1521 (UK), https://api.parliament.uk/historic-hansard/lords/1987/nov/12/copyright-designs-and-patents-bill-hl#column_1476 (quoting the Earl of Stockton Maurice Harold Macmillan).

[38] Shenzhen Tencent Comput. Sys. Co. v. Shanghai Yingxun Tech. Co., (People's Ct. of Nanshan (Dist. Of Shenzhen) Dec. 24, 2019) (China), *translated in* 51 INT'L REV. INTELL. PROP. & COMPETITION L. 652 (2020).

[39] *Id.* at 657.

[40] Zhou Bo, *Artificial Intelligence and Copyright Protection–Judicial Practice in Chinese Courts*, WORLD INTELL. PROP. ORG., https://www.wipo.int/export/sites/www/about-ip/en/artificial_intelligence/conversation_ip_ai/pdf/ms_china_1_en.pdf (last visited Nov. 29, 2020).

[41] *E.g.*, Robert Denicola, *Ex Machina: Copyright Protection for Computergenerated Works*, 69 RUTGERS U. L. REV. 251, 287 ("The United States, either by judicial decision or statutory amendment, should join them."); Kasap, *supra* note 1, at 377 ("[T]he CDPA is a reasonable pathway that the United States legislature should follow . . . .").

[42] 17 U.S.C. § 201(b).

[43] *See* Bridy, *Coding Creativity*, *supra* note 15, at ¶ 66; Hristov, *supra* note 31, at 442–43; *see also* Yanisky-Ravid, *supra* note 1, at 712 ("The autonomous AI system, just like WMFH-employed creators, is the creative author of a work. When an AI system acts autonomously, it can be compared to an independent contractor and thus be shielded under WMFH doctrine.").

[44] 17 U.S.C. § 101. *See* Hristov, *supra* note 31, at 446 ("'[E]mployer' may be considered as someone who employs the services of another entity in order to achieve a goal or complete a task.").

[45] Cmty. for Creative Non-Violence v. Reid, 490 U.S. 730, 739–41 (1989).

[46] European Pat. Off., *supra* note 29, ¶ 32.

II. Creativity as Copyright's Basis

Regardless of the legal status quo in the United States, it is to be examined whether the human creation requirement should be abolished, or the "work made for hire" doctrine should be more generously interpreted for policy reasons.

Copyright law is not only anthropocentric but also "intended to motivate the creative activity of authors and inventors."[47] Its "ultimate aim is . . . to stimulate artistic creativity for the general public good."[48] According to the U.S. Supreme Court, the originality requirement in the Copyright Act[49] necessitates "that the author make the selection or arrangement independently (i.e., without copying that selection or arrangement from another work), and that it display some minimal level of creativity."[50] Similarly, the ECJ requires that an author "express his creative abilities in the production of the work by making free and creative choices."[51] The Chinese court case discussed in Part I also took into account a "creative process" and based its argument on adjudging a creative act.[52]

This illustrates that, despite all the remarkable differences between the U.S. copyright framework and other copyright regimes, especially in civil law countries, the creativity-based approach constitutes a global principle.[53] In fact, the author of a work is traditionally more central in civil

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[47] Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417, 429 (1984).
[48] Twentieth Century Music Corp. v. Aiken, 422 U.S. 151, 156 (1975).
[49] 17 U.S.C. § 102.
[50] Feist Publ'ns, Inc. v. Rural Tele. Serv. Co., 499 U.S. 340, 358 (1991); *id.* at 363 ("[C]opyright protects only those constituent elements of a work that possess more than a *de minimis* quantum of creativity."); *see also* Goldstein v. California, 412 U.S. 546, 561 (1973) ("[T]he word 'writing' may be interpreted to include any physical rendering of the fruits of creative intellectual or aesthetic labor.").
[51] Case C-145/10, Painer v. Standard VerlagsGmbH, 2011 E.C.R. I-12594, ¶ 89; *see also* Case C-604/10, Football Dataco Ltd. v. Yahoo! UK Ltd., ECLI:EU:C:2012:115, ¶ 38 (Mar. 1, 2012).
[52] Shenzhen Tencent Comput. Sys. Co. v. Shanghai Yingxun Tech. Co., (People's Ct. of Nanshan (Dist. Of Shenzhen) Dec. 24, 2019) (China), *translated in* 51 INT'L REV. INTELL. PROP. & COMPETITION L. 652, 657 (2020) ("[W]hen determining whether an act is creative, it should be considered whether the act is an intellectual activity and whether there is a direct connection between the act and the specific expression of the works.").
[53] Dornis, *supra* note 16, at 17 ("Copyright protection in virtually all jurisdictions depends on the quintessential element of human creativity. Both civil-law and common-law copyright have an anthropocentric foundation."); Schönberger, *supra* note 24, at 37 ("[I]n the existing international copyright landscape creativity is the touchstone for any literate or artistic work seeking protection. Since the Supreme Court decision in *Feist*, US contemporary copyright law has been understood as 'creativity law'. And also copyright regimes in the *droit d'auteur* tradition put intellectual creativity at the heart of the protection provided."). The United Kingdom, on the other hand, which is at the forefront of protecting computer-generated works, dissociates itself from a creativity-based approach. *See* Andreas Rahmatian, *Originality in UK Copyright Law: The Old "Skill and Labour" Doctrine Under Pressure*, 44 INT'L REV. INTELL. PROP. & COMPETITION L. 4, 13 (2013) ("It is not (artistic) creativity, but the potential (not actual) economic value of the author's investment, skill and labour deployed in the making of a property (the copyright work) which copyright protects."); PAUL TORREMANS, HOLYOAK AND TORREMANS INTELLECTUAL PROPERTY LAW 178–79 (9th ed. 2019) ("[T]here must have been a minimum investment by the author of skill, judgement, and labour . . . . On the one hand, that skill and labour must not be so trivial that it could be characterized as a purely mechanical exercise; on the other, creativity, as such, is not required either.").

law than in common law, which tends to emphasize social and economic welfare.[54] Since civil law countries emphasize moral rights, authorship of machines is even more difficult for civil law regimes to justify than for common law regimes.[55] Notwithstanding different emphases, however, both systems are based on the notion that works are public goods; that is, they may be exploited by an unlimited number of users, but do not allow for remuneration because others cannot be excluded.[56] This discourages creation of works, resulting in a market failure. To offset this, copyright systems give authors an incentive to produce and publish their works, thus making them open to the public.[57]

Worldwide, a common thread can be discerned: creativity is copyright's basis. Many scholars assume that AI is creative in this sense.[58] However, the devil is in the details.

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[54] Ginsburg, *supra* note 27, at 134 ("Copyright, however, reposes on two pillars (whose respective widths vary in common law and civilian systems): one (generally attributed to civil law states), the natural rights of the author, a rationale that roots exclusive rights in personal creativity, and that largely underpins the Berne Convention; the other (most frequently associated with common law countries), incentives to create, to invest in creativity, and to disseminate works for the general benefit of society."); *see also* de Cock Buning, *supra* note 6, at 319–20 ("The Anglo-American copyright law traditionally has a more pragmatic approach with regard to authorship, since it is vested in the US Constitution as an incentive for creation and innovation. . . . It puts less emphasis on the protection of the creator/author and more on the furthering of production of works that have value for society. As a result, in the United States – like in the United Kingdom – the resistance against protection of (partial) machine creation is traditionally less fierce. . . . Given the standard of harmonization of European copyright law, this is and will be the leading approach towards copyright in all Member States of the European Union, including the UK, leaving little or no room for the protection of the output of [Autonomous Intelligent Systems] as Creative Agents."); Matthias Leistner & Gerd Hansen, *Die Begründung des Urheberrechts im digitalen Zeitalter – Versuch einer Zusammenführung von individualistischen und utilitaristischen Rechtfertigungsbemühungen*, GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT 479 (2008) (Ger.) (arguing that, also in the digital age, only a synthesis of individualistic and utilitarian approaches may justify a copyright in continental European design); Rohner, *supra* note 24, at 72 (demonstrating that, historically, German-speaking scholars stressed the personal and idealistic component of copyright); Yanisky-Ravid, *supra* note 1, at 699 ("Today, U.S. intellectual property law is based primarily on the law and economics utilitarianism approach and, in part, John Locke's theory of labor. By contrast, the civil law approach to copyright protection justifies property rights by the importance of the creators' personality in the works (personality approach), as well as by the ownership of the fruits stemming from the person's body and soul (Locke's approach or labor approach.").

[55] Bridy, *supra* note 15, at 400–01. Moral rights concern the intellectual and personal relationship of the author to their work, i.e. rather spiritual than economic interests. Martin Miernicki & Irene Ng (Huang Ying), *Artificial Intelligence and Moral Rights*, AI & SOC'Y (Aug. 3, 2020), https://doi.org/10.1007/s00146-020-01027-6 ("Moral rights acknowledge that authors have personal interests in their creations and the corresponding use that is made of them. These interests are conceptually different from the economic or commercial interests protected by the author's economic rights which are typically understood to enable the author to derive financial gain from her creation . . . .").

[56] TORREMANS, *supra* note 53, at 18; Rohner, *supra* note 24, at 74.

[57] *See* TORREMANS, *supra* note 53, at 17–18;Yanisky-Ravid, *supra* note 1, at 700; Dornis, *supra* note 16, at 33–36; Colin R. Davies, *An Evolutionary Step in Intellectual Property Rights – Artificial Intelligence and Intellectual Property*, 27 COMPUT. L. & SEC. REV. 601, 605 (2011); *see also* Mazer v. Stein, 347 U.S. 201, 219 (1954) ("The economic philosophy . . . is the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare through the talents of authors and inventors . . . .").

[58] *E.g.*, Hristov, *supra* note 31, at 434 ("[C]reativity machines and other forms of AI will likely take center stage in the creative process, becoming the main drivers of creativity and innovation."); Denicola, *supra* note 41, at 272 ("'[T]he requisite level of creativity is extremely low; even a slight amount will suffice.' Many computer-generated

A. Outlining Creativity

Everyone has an idea of what creativity is. Nevertheless, it is difficult to outline it, as there is no universal definition.[59] Therefore, this Article can only demonstrate certain aspects of creativity which academia discusses. Most importantly, in many definitional approaches, creative ideas are characterized both as new or novel as well as valuable[60] or adaptive.[61] Philosophers and psychologists essentially agree on this.[62]

Generally, creativity manifests itself in three ways: (1) as an intellectual process that produces adaptable and original ideas, (2) as a kind of person who carries creativity to the outside world, and (3) as the concrete work that emerges from the creative process.[63] Typically, character traits, biographical experiences, and emotions, among other things, serve as sources of creative thinking.[64] Hence, some require skill, appreciation, and imagination as a benchmark for creativity.[65]

B. AI's Mirage

One could be forgiven for inferring, based on the rapidly increasing sophistication of AIs, that AI is capable of creativity. That is because algorithms have amazing capabilities that—in biological organisms—require complex cognitive processes that have only been observed in humans. For example, algorithms can see items, understand languages, and draw conclusions.[66] In 2016, the

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works easily meet that standard." (quoting Feist Publ'ns, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 345 (1991)); Yanisky-Ravid, *supra* note 1, at 679 ("AI systems are capable of more than just copying other works from accessible sources. They operate as creative devices capable of creating entirely new and original works."). *But see* Yanisky-Ravid, *supra* note 1, at 724 ("It may be that the process by which an AI system creates an original work is not 'creativity,' which, as a term, has not been thoroughly explained by the [U.S. Supreme] Court. . . . But it may just as well be the case that the creativity standard the Court articulated in Feist requires that innate, hard-to-define aesthetic sensibility that is, particular to living creatures."). Similarly, *Boden* deems the question of AI's creativity "currently unanswerable." Margaret A. Boden, *Computer Models of Creativity*, 30(3) AI MAG. 23, 33 (2009); *see also* Dornis, *supra* note 16, at 15–16 (though "the results of such artificial creativity qualify as entertaining, informative, and inspiring—all traits that were once considered as exclusively belonging to humans," Dornis grounds his reasoning mainly on the fact that AI's skills are improving, so "[e]ven though AI may never perfectly match all human capacities, the gap between artificial and natural intelligence will someday shrink beyond recognition").

[59] More than fifty definitions of creativity can be derived from different sources. DAVID LEVY, ROBOTS UNLIMITED: LIFE IN A VIRTUAL AGE 149 (2006).

[60] Boden, *supra* note 58, at 24.

[61] *See* de Cock Buning, *supra* note 6, at 315.

[62] *See id.* at 315–16.

[63] *Id.* at 315. Similarly, the famous American educational scientist James Melvin Rhodes described creativity using the "4Ps," Person, Process, Press, and Product. Aleksandra Gruszka & Min Tang, *The 4P's Creativity Model and Its Application in Different Fields*, *in* HANDBOOK OF THE MANAGEMENT OF CREATIVITY AND INNOVATION: THEORY AND PRACTICE 51 (Min Tang & Christian H. Werner eds., 2017).

[64] Sarah Legner, *Erzeugnisse Künstlicher Intelligenz im Urheberrecht*, ZEITSCHRIFT FÜR URHEBER- UND MEDIENRECHT [ZUM] 807, 809–10 (2019) (Ger.).

[65] Simon *Colton, Creativity Versus the Perception of Creativity in Computational Systems*, *in* AAAI SPRING SYMPOSIUM: CREATIVE INTELLIGENT SYSTEMS 14 (2018), https://www.aaai.org/Papers/Symposia/Spring/2008/SS-08-03/SS08-03-003.pdf.

[66] de Cock Buning, *supra* note 6, at 312.

AI program AlphaGo even beat the best human player[67] of the board game Go. Go is arguably the most complex board game and is a game that cannot be played solely by computing possible moves.[68] These achievements could be viewed as steps towards the comprehensive superiority of machines.

However, these spectacular achievements conceal AI's shortcomings relative to other areas of human cognition. For instance, algorithms cannot plan and take initiative well.[69] For the time being, machines depend on human instructions and leadership.[70] But most notably, they lack internal understanding and awareness of what they are doing.[71] Machines do not reflect the zeitgeist, do not process social and societal impressions, and do not get inspired on subconscious levels.[72] Yet, according to the U.S. Supreme Court, this is a crucial factor for copyright protection.[73] The mere fact that AI technology has the ability to surprise us and even those who programmed and trained it does not necessarily amount to creativity and deserve authorship.[74]

Regarding the project "You Can't Know My Mind,"[75] the software's "mood" was merely a mock mood influenced by data and, thus, just created the illusion of creativity. It is similar to the "next" Rembrandt painting.[76] Executive Bas Korsten, who had the idea for the project and supervised it, admitted that the project was not intended to create a *new* Rembrandt.[77] Therefore, the result cannot be considered original creativity, but rather the absorption of Rembrandt's creative output and, thus, a mere summary of this creativity into a supposedly new work. There can be no doubt that the concept was innovative and exciting. However, it created a "typical

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[67] This player was Lee Sedol, the winner of eighteen world titles at that time. *AlphaGo*, DEEPMIND, https://deepmind.com/research/case-studies/alphago-the-story-so-far (last visited Nov. 29, 2020).
[68] *See* Paul Mozur, *Google's AlphaGo Defeats Chinese Go Master in Win for A.I.*, N.Y. TIMES (May 23, 2017), https://www.nytimes.com/2017/05/23/business/google-deepmind-alphago-go-champion-defeat.html; *AlphaGo*, *supra* note 67; *see also* Lim, *supra* note 3, at 830.
[69] de Cock Buning, *supra* note 6, at 313; *see also* Ginsburg & Budiardjo, *supra* note 31, at 394 ("[T]he idea of true machine thought, guided by the sort of 'intrinsic motivation' that drives all human behavior, may still be far off.").
[70] Ginsburg & Budiardjo, *supra* note 31, at 400 ("[I]t should suffice to note that today's machines, and those of foreseeable tomorrows, are entirely subservient to the humans who delineate their instructions and tasks."). AI is, hence, unlikely to overcome established principles and, thus, achieve significant advancements. *See infra* Part V.
[71] Yanisky-Ravid, *supra* note 1, at 724 ("Even if a machine could create a unique rendering of a subject, it is very unlikely that AI system would understand what that subject is. It thus lacks the type of internal comprehension that is generally reflected in the works of a human artist when they try to represent something more than the words on the page or the paint on the canvas.").
[72] Kristin Oswald, *KI als Kultur-Geschäftsführer der Zukunft*, Kultur Management (Aug. 20, 2018), https://www.kulturmanagement.net/Themen/Kuenstliche-Intelligenz-und-Kreativitaet-KI-als-Kultur-Geschaeftsfuehrer-der-Zukunft,2348 (Ger.) (last visited Nov. 29, 2020) (interview with Prof. Dr. Paul Lukowicz, Scientific Director and Head of the Research Department Embedded Intelligence at the German Research Center for Artificial Intelligence).
[73] *Cf.* Feist Publ'ns v. Rural Tel. Serv. Co., 499 U.S. 340, 362 (1991) ("[A]n author who claims infringement must prove 'the existence of . . . intellectual production, of thought, and conception.'" (quoting Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53, 59–60 (1884))).
[74] Ginsburg & Budiardjo, *supra* note 31, at 398.
[75] *See supra* note 6 and accompanying text.
[76] *See supra* notes 7–8 and accompanying text.
[77] Brown, *supra* note 7 ("Korsten stressed the project was not trying to create a new Rembrandt. 'We are creating something new from his work. Only Rembrandt could create a Rembrandt.'").

Rembrandt" rather than a "new Rembrandt." The same holds true for the song "Daddy's Car," which is based on Beatles music.[78] Under our current state of the art, AI always relies on sufficient data, instructions and specifications, whereas the human creative process is not confined. Think of another example: a tree that stretches its branches to form a handsome crown to maximize its light absorption seems to act in a new and useful way; nonetheless, it lacks intention, wishes, and views, so it cannot act creatively.[79] Creativity requires, besides novelty and usefulness, "a relevant purpose . . . some degree of understanding . . . a degree of judgement . . . and an evaluative ability directed to the task at hand."[80] There is much to suggest that individual experiences and traits of the author influence their creative output.[81] Machines cannot yet replicate that.

Therefore, natural and artificial intelligences should not (yet) be equated.[82] It follows that, due to its lack of creativity, AI's work does not qualify for copyright protection. Some authors contend that "the creativity the AI displays flows either from the algorithm used to design and train it, or from the instructions provided by the users operating it,"[83] but this blurs the line between computer-generated and computer-assisted works.[84] While AI software is learning and, thus, improving, the person creating it is moving so far into the background that the products cannot be attributed to that person anymore.[85] Given the ever-increasing amount of computing power available and the immense resources being directed to the development of artificial intelligence, an artificial form of creativity might be achieved in the future.[86] However, for the foreseeable future, it is inappropriate to extend copyright protections to works created by algorithms.

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[78] For a link to that song, see *supra* note 9.
[79] de Cock Buning, *supra* note 6, at 316.
[80] *Id.*
[81] Anne Lauber-Rönsberg, *Autonome „Schöpfung" – Urheberschaft und Schutzfähigkeit*, GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT [GRUR] 244, 251–52 (2019) (Ger.).
[82] *See id.*; Ginsburg & Budiardjo, *supra* note 31, at 349, 393–400 ("Because computers today, and for proximate tomorrows, cannot themselves formulate creative plans or 'conceptions' to inform their execution of expressive works, they lack the initiative that characterizes human authorship. . . . No machine is itself a source of creativity."); Kasap, *supra* note 1, at 350 ("AI has not possessed all features of humans yet, and there is still a long way to acquire those skills . . . ."); Gervais, *supra* note 16, at 2093 ("[M]achines cannot make creative choices . . . "); Ron Miller, *Artificial Intelligence Is Not As Smart As You (or Elon Musk) Think*, TECH CRUNCH (July 25, 2017), https://techcrunch.com/2017/07/25/artificial-intelligence-is-not-as-smart-as-you-or-elon-musk-think/ (noting that "[s]hould researchers ever become more successful at developing generalized AI, this could change, but for now there are things that humans can do easily that are much more difficult to teach an algorithm, precisely because we are not limited in our learning to a set of defined tasks"). *Contra* Davies, *supra* note 57, at 604 ("The one thing intellectuals are reluctant to accept is the concept of a machine possessing the ability for creative thought."); Tim W. Dornis, *Der Schutz künstlicher Kreativität im Immaterialgüterrecht*, GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT [GRUR] 1252 (1254–55) (2019) (Ger.) (asserting that that AI is already emancipating itself from human mastery).
[83] Lim, *supra* note 3, at 842.
[84] On that distinction, see *supra* note 31 and accompanying text.
[85] *See* sources cited *supra* note 30.
[86] *Cf.* de Cock Buning, *supra* note 6, at 313 ("The current [Autonomous Intelligent Systems], however sophisticated and unpredictable their output may sometimes be, in themselves do not yet constitute fully autonomous, general-

III. Economic Aspects of Exclusive Protection

Beyond copyright protection, a sui generis right may be considered.[87] Such rights do not exist in the United States yet. European Union (EU) law, on the other hand, provides for sui generis rights for particular subject matters, such as databases.[88] International copyright usually refers to these rights as "related rights."[89] Sui generis rights are similar to copyrights in that they are exclusive, but they do not require copyrightable subject matter.

A. Incentives and Market Failure

The most prominent argument in favor of an intellectual property (IP) right in AI-created works is that it would provide developers and entities with an incentive to invest in and employ AI technology.[90] A machine itself does not need any incentive; however, the incentive for disclosure shall be provided for the humans behind the technology.[91] Only benefits reaching at least the level of investment will avoid market failure due to underproduction of creative works.[92] In general, it does seem desirable to protect investments.[93] After all, given that refining AI technologies presupposes sufficient funding, and sui generis rights under European law are rooted in safeguarding investments,[94] affording such a right for machine-authored works seems an obvious consequence.

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purpose artificial intelligent Creative Agents since these systems still lack important capabilities such as planning and taking initiatives. Yet, they do not stand alone, and they herald the coming of the 'singularity', the technological lift-off point, in which a combination of scientific and technical breakthroughs will lead to an explosion of self improvinartificial intelligence, representing the nearly vertical phase of exponential growth that occurs whenthe rate is so extreme that technology seems to be expanding at infinite speed. Along those lines, the development of systems and machines that will be capable of autonomous creation seems to be inevitable.").

[87] Dornis, *supra* note 16, at 17 ("The assignment of genuine authorial copyrights may still be reserved for human-made creations. But this does not exclude alternative means of protection."). The concept of sui generis rights does not require human creation. *Id.* at 33, 44–59.

[88] *See* Directive 96/9, *supra* note 19, at 25–27 art. 7–11.

[89] *E.g.*, TRIPS: Agreement on Trade-Related Aspects of Intellectual Property Rights pt. II § 1 , Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299. They are called *droits voisins* in France, *Leistungsschutzrechte* in Germany, *diritti connessi* in Italy, and *naburige rechten* in the Netherlands. Dornis, *supra* note 16, at 44.

[90] *See* Hristov, *supra* note 31, at 438–39; Dornis, *supra* note 16, at 43; Dornis, *supra* note 82, at 1258–59; *see also* Denicola, *supra* note 41, at 273 ("At least for now, the production of computer-generated works requires human beings to develop, improve, distribute, and use the computer technology and to disseminate the resulting output. The incentive of copyright protection may play a role, large or small, in all of these human activities.").

[91] *See* Hristov, *supra* note 31, at 444; de Cock Buning, *supra* note 6, at 322; Denicola, *supra* note 41, at 273; Dornis, *supra* note 16, at 35; Kasap, *supra* note 1, at 362; Lim, *supra* note 3, at 840–42.

[92] Dornis, *supra* note 16, at 36; Dornis, *supra* note 82, at 1258.

[93] Sven Hetmank & Anne Lauber-Rönsberg, *Künstliche Intelligenz – Herausforderungen für das Immaterialgüterrecht*, GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT [GRUR] 574, 579–80 (2018) (Ger.).

[94] *See*, *e.g.*, Directive 96/9, *supra* note 19, at 22 ¶ 39 ("[T]his Directive seeks to safeguard the position of makers of databases against misappropriation of the results of the financial and professional investment made in obtaining and [collecting] the contents by protecting the whole or substantial parts of a database against certain acts by a user or competitor.").

On counter, however, is that there may already be enough incentives to create through existing protections.[95] Namely, there is "copyright or patent protection of the software programs, patent protection of the specialized machinery to produce works of fine and applied art, and copyright or (in the EU) sui generis protection of the database the software consults."[96] Furthermore, if the main reason for deploying machines to create works is their speed, as it is, for instance, with authoring online news and other immediately consumable media, no copyright protection is needed to provide economic incentives.[97] Moreover, as an overall phenomenon, investment in AI is currently increasing very rapidly—from $282 million in 2011 to $9.334 billion in 2018 in the United States,[98] even though many relevant markets, including the United States and China, do not provide protection.[99] That results in an average increase of about 165 percent per year. Globally, investments in AI increased from $4.5 billion in 2013 to $39.2 billion in 2017.[100] Not surprisingly, the number of patent applications worldwide in the area of AI has risen from 22,913 in 2008 to 78,085 in 2018.[101] The global revenues from the AI software market is expected to grow from $10.1 billion in 2018 to $126 billion in 2025.[102]

The AI industry and AI users may invest in and employ that technology out of miscellaneous motivations, which may not always include copyright protection.[103] The continuing increase in investments might be explained by lower development costs, for example, when designing fashion or writing articles, which is why a smaller incentive through mere software protection suffices. In any case, a sui generis right would only be economically efficient if the resulting benefit outweighed the costs. However, since public domain products can be used optimally and there are barely any apparent obstacles to investment, there is much to suggest that demands for an exclusive right are based rather on lobbying than on economic necessity.[104] Regardless, the burden of proof lies with proponents of protection; whoever pushes for abridging the freedom of

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[95] Rohner, *supra* note 24, at 77; Yanisky-Ravid, *supra* note 1, at 702; *see also* Palace, *supra* note 12, at 239 ("[T]here is little reason to believe that immediate entrance into the public domain would lead to any significant loss in incentives for programmers and artificial intelligence companies.").

[96] Ginsburg, *supra* note 27, at 134; *see also* Samuelson, *supra* note 17, at 1225 ("The programmer can already be rewarded for the commercial value of the program—which is what he created—through sales of the program or license fees for use of the program. That is probably all the motivation he needs.").

[97] Yu, *supra* note 30, at 1246–47, 1264–65 (referring to an example of the *L.A. Times*, which in 2014 published an online report on an earthquake just a couple of minutes after it had happened; software called Quakebot received the geological data and immediately generated the article).

[98] Shanhong Liu, *Artificial Intelligence (AI) Funding Investment in the United States From 2011 to 2019*, STATISTA (June 8, 2020), https://www.statista.com/statistics/672712/ai-funding-united-states/.

[99] Rohner, *supra* note 24, at 77–78, 82 (asserting an increase of global investments by 300 percent from 2016 to 2017). Neither does the EU provide protection. *See supra* notes 18–23 and accompanying text.

[100] Thomas Alsop, *Global Artificial Intelligence (AI) Investment and Financing From 2013 to Q1 2018*, STATISTA (Mar. 2, 2020), https://www.statista.com/statistics/941137/ai-investment-and-funding-worldwide/.

[101] Shanhong Liu, *Number of Artificial Intelligence (AI) Patent Applications Worldwide from 2008 to 2018*, STATISTA (July 7, 2019), https://www.statista.com/statistics/1007843/number-of-ai-patent-applications-worldwide/.

[102] Shanhong Liu, *Artificial Intelligence (AI) Software Market Revenue Worldwide From 2018 to 2025*, STATISTA (Mar. 13, 2020), https://www.statista.com/statistics/607716/worldwide-artificial-intelligence-market-revenues/.

[103] Yu, *supra* note 30, at 1270 ("Regardless of whether or not the law grants copyright protection, programs will continue to work away with each passing moment, processing, computing, and creating.").

[104] *Cf.* Rohner, *supra* note 24, at 70.

use through establishing an exclusive right must prove its economic justification.[105] Market failure is not proven yet. So, even if AI became what we deem creative one day, this would not automatically justify a call for copyright protection.

B. Skepticism Towards Monopolies

In this author's view, other economic considerations militate against an exclusive right for AI-generated works as well, be it a copyright or sui generis right. This is because by using AI, works can be produced extremely quickly and in much larger numbers. Imagine a company claiming to have generated almost every possible text of ten to 400 words in several common languages and charging royalties for using them, thus becoming a huge copyright troll. In fact, an Austrian performance artist did come up with that mock assertion in 2014.[106] It would be unlikely for such a business model to prevail as courts and legislators would never allow such an absurd situation. Nevertheless, this made-up claim should startle us and make us aware of the power of monopolies. Intelligent machines could drive the number of IP rights to a level far beyond our current imagination. Too many IP rights—that is, government-granted monopolies—lead to a restriction of competition, while at the same time the access to that technology is limited to relatively few actors.[107] Hence, too many monopolies rather *endanger* innovation, rendering the monopolies to be concentrated among those who are already powerful. The powerful would, thus, become even more powerful. Only a small circle in just a few countries would benefit enormously.[108] Should this occur, there is a threat of commercialization, concentration, and homogenization of information.

IV. Supersession of Human Creation

Despite all the remarkable achievements and advantages of AI, another danger is looming. Products created by AI provide the public with the same benefits as human creations.[109] Some AI-generated products may even be perceived as superior in the market.[110] According to a study from Rutgers University, respondents not only were unable to distinguish between computer-

[105] *See* Ginsburg & Budiardjo, *supra* note 31, at 448 ("We can conjure up a variety of scenarios supporting or debunking the call for sui generis protection, but without empirical evidence, it would be imprudent (and premature) to seek to design a regime to cover authorless outputs.").
[106] *See* Schafer et al., *A Fourth Law of Robotics? Copyright and the Law and Ethics of Machine Co-Production*, 23 A.I & L. 217, 225–26 (2015). *See also* Rohner, *supra* note 24, at 78–79. The artist's name is Michael Marcovici. Schafer et al., *supra* note 106, at 226.
[107] Hetmank & Lauber-Rönsberg, *supra* note 93, at 580; *see also* Rohner, *supra* note 24, at 78–79.
[108] Palace, *supra* note 12, at 237.
[109] Denicola, *supra* note 41, at 271; *see also* Dornis, *supra* note 16, at 42; Dornis, *supra* note 82, at 1260 (despite supporting the notion of IP protection for AI generated works, acknowledging the issue of a possible substitution).
[110] Hetmank & Lauber-Rönsberg, *supra* note 93, at 581.

generated and human art, but also ranked AI-created paintings as superior with regard to, among other things, visual structure and inspiration.[111]

It is true that human creations remain protected because, regardless of higher or lower quality, artistic quality is irrelevant in copyright law. Regardless, human beings could be economically superseded by AI since the latter is capable of much great output, both in terms of rate and quantity; this is truer if their products are perceived as superior.[112] Moreover, vesting protection in AI products might discourage human artists from creating.[113] Further, AI-created artistic works may be seen as superior only in the short term; in the long term, however, works produced by algorithms are likely to be more homogeneous, which would reduce diversity and turn creative works into commodities.[114] Ultimately, algorithms are not creative.[115] They are always largely based on initial human instructions and what already exists, and consequently, fundamental innovations are not to be expected. AI is capable of composing a new song in the style of the Beatles[116] but probably could not revolutionize the music scene with a completely new and astounding creation. It seems utterly questionable whether AI products could "promote the Progress of Science and useful arts" as conceived by the U.S. Constitution.[117] Therefore, leaving the advantage of legal protection to human creation may prevent the diversion of too much investment away from man-made works, thereby promoting *essential* innovation and preserving copyright's major purpose.

This brings us to the question of whether the market is capable of regulating this issue itself by reducing demand for (inferior) products of AI. However, if they are cheaper, the demand is unlikely to be low. Furthermore, it is doubtful whether consumers can make sufficiently rational and well-informed decisions by keeping an eye on the long-term development of crowding-out.

V. Recognizability and Transparency

Without any IP protection, it is contended, there is a danger that people will sell an AI-created work as their own, refraining from disclosure that the work was actually created by algorithms, which leads to a lack of transparency.[118] It would be more difficult for users to recognize

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[111] Sarah Cascone, *AI-Generated Art Now Looks More Convincingly Human Than Work at Art Basel, Study Says*, ARTNET (July 11, 2017), https://news.artnet.com/art-world/rutgers-artificial-intelligence-art-1019066; *see also* Dornis, *supra* note 16, at 14.

[112] *Contra* Kasap, *supra* note 1, at 363 ("AI-systems should not be seen as replacing human authors, since obviously they can evolve together."); Yanisky-Ravid, *supra* note 1, at 703 ("[I]t is likely that machine-produced works could not serve as a perfect replacement for human-authored works.").

[113] Schönberger, *supra* note 24, at 46–47.

[114] Ulrich Loewenheim & Matthias Leistner, *Persönliche Schöpfung*, *in* URHEBERRECHT § 2 UrhG ¶ 42 (6th ed. 2020) (Ger.).

[115] *See supra* Part II.B.

[116] *See supra* notes 9–10 and accompanying text.

[117] U.S. CONST. art I, § 8, cl. 8.

[118] *See* Hristov, *supra* note 31, at 450; Dornis, *supra* note 16, at 39; Dornis, *supra* note 82, at 1259; Kasap, *supra* note 1, at 363.

whether the work is in the public domain or whether they need a permit.[119] Although, a certain degree of vagueness is simply inherent in copyright law, given the ambiguity of the conditions for protection—namely, the originality requirement under U.S. copyright law—registration with the U.S. Copyright Office alleviates the transparency issue.[120] Admittedly, applicants might still make false statements as to a work's origin in order to receive protection. The same problem might occur in other countries in cease-and-desist letters or during trials. However, this would probably constitute an offense in many countries, and with respect to the United States, it should also be noted that the use of AI can be discovered during litigation.[121]

In addition, it could be argued that denying protection avoids another kind of problem of ambiguity, namely of stipulating and determining on a case-by-case basis which natural person owns the exclusive rights in an AI generated work.[122] Under UK law, it is "the person by whom the arrangements necessary for the creation of the work are undertaken."[123] That leaves some room for interpretation and controversy. This Article does not have to address that issue.

Conclusion

It is an internationally accepted principle of intellectual property law that copyright protection attaches only to the products of human creativity. Responding to calls to extend intellectual property rights to AI-generated works, this Article has raised significant economic and social concerns that militate against overturning that global policy and granting intellectual property protection for works produced by AI, whether it be in copyright or through a novel sui generis right, in a civil law or common law jurisdiction. Whoever intends to establish a monopoly through an exclusive right has to prove its economic efficiency and necessity. The more convincing arguments prompt that existing incentives suffice. Companies already have reason to employ and invest in AI technology in order to create products in typical copyright related fields, such as music, design, literature, and software. Moreover, numerous new monopolies would occur exceedingly fast, which might rather hamper than foster innovation and make the powerful even more powerful. Finally, we should ask ourselves whether AI could overtake us and supersede human creation, thus diminishing essential innovation.

Regardless, beyond those economic and social aspects, this Article contends that copyright protection is quite the wrong approach for rewarding application of and investment in AI technology. There can be no doubt that machines are superior in certain ways. However, in their

[119] See, for example, Yu, *supra* note 30, at 1266, where even opponents of protection conceded that refraining from disclosure will increase the difficulty of enforcing false copyrights.
[120] *See supra* text accompanying notes 13–14.
[121] Palace, *supr*a note 12, at 237. Nonetheless, this problem of evidence is more substantial in jurisdictions without discovery procedures. A conceivable alternative there might be labelling obligations under (European) unfair competition law.
[122] Right from the advent of the discussion on computer-generated works, that issue was on the table. *Cf.* Samuelson, *supra* note 17.
[123] Copyright, Designs and Patents Act 1988, c. 48, § 9(3) (UK).

process of creating, they are still very distinguishable from humans. Algorithms lack crucial skills, such as purpose, understanding, awareness, intuition, inspiration, and reflection. There might be artificial intelligence, but there is no artificial creativity.