ARTIFICIAL CREATIVITY: EMERGENT WORKS AND THE VOID IN CURRENT COPYRIGHT DOCTRINE

Tim W. Dornis*

22 YALE J.L. & TECH. 1 (2020)

Artificial intelligence (AI) is on everyone's lips and is in everyday use. Yet discussion of what this means for our present and future—particularly in terms of the revolutions that AI might bring to the legal sphere—has only just begun. One topic that warrants, but has yet to receive, in-depth attention is the relevance of AI for innovative and creative activity and production. Legal analyses thus far have focused on humans and their role as innovators, authors, or creators. Left in the dark, however, is the question of how to regulate AI when it "innovates" or "creates" autonomously—without human direction or intervention.

Examples of such artificial creativity abound. Robots and computers have recently come to paint works of art, compose symphonies, and write news articles, poetry, and novels. All of these "works" would doubtlessly be protected by copyright if created by a human being. But we are hopelessly naïve when confronted with whether and how copyright law and neighboring areas of intellectual property protection should respond to the rise of AI. Indeed, current law is devoid of rules and doctrines for artificial creativity—with the result that AI-generated works are left unprotected. The consequences of such neglect are yet to be discussed.

This Article provides an overview of the status quo of artificial creativity—i.e., creative production by AI—and its regulation (or, rather, non-regulation) in different jurisdictions, as well as an analysis of relevant doctrinal debates and economic foundations. It then offers suggestions for a reconceptualization of current

* Ph.D./Dr. iur. (Tuebingen/Germany), J.S.M. (Stanford University), attorney-at-law (New York), Professor of Law, Leuphana Law School (Lueneburg/Germany), and Global Professor of Law, NYU School of Law (New York/Paris). The author thanks Henrik Holzapfel, Florian Keßenich, Mark A. Lemley, and Thomas Wein for helpful remarks. Comments are welcome at tim.dornis@gmail.com.

doctrine, outlining a roadmap and overarching framework for legislative action and practical adjudication.

TABLE OF CONTENTS

"Don't mourn for me, friends, don't weep for me never,
For I'm going to do nothing for ever and ever.
With psalms and sweet music the heavens'll be ringing,
But I shall have nothing to do with the singing."

–J.M. Keynes, Economic Possibilities for our Grandchildren, in: Essays in Persuasion, 358, 367 (1930)

INTRODUCTION

Artificial intelligence (AI) is on everyone's lips and seems to be in everyday use.[1] Yet the debate on its implications for our present and future has only just begun. This is true for the discussion about the changes that AI will bring to our life in general, but especially for the revolutions that it may bring to the legal sphere. To start, there is no authoritative definition of AI. The initiators of the 1956 Dartmouth Conference (the birth of AI research as an academic discipline) did not provide a definition.[2] In more recent years, AI scientists and scholars of other disciplines have attempted to describe the essence of AI, but the results are largely divergent, if not contradictory.[3] The only point of general agreement seems to be that AI systems are supposed to and do perform tasks that would normally require human intellect, particularly image recognition, language comprehension, and decision-making.[4]

---

[1] Throughout this Article, I use the term "artificial intelligence" to refer to algorithms and computer or robotic apparatuses that are capable of accomplishing tasks usually considered to require specific aspects of human or natural intelligence. For a more detailed definition, see *infra* Section I.A.

[2] *Cf.* John McCarthy, Marvin L. Minsky, Nathaniel Rochester & Claude E. Shannon, *A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence, 1955*, *reprinted in* 27 AI MAG. 12 (2006).

[3] STUART J. RUSSEL & PETER NORVIG, ARTIFICIAL INTELLIGENCE: A MODERN APPROACH 5 (3d ed. 2010); Shane Legg & Marcus Hutter, *Universal Intelligence: A Definition of Machine Intelligence*, 17 MINDS & MACHINES 391 (2007).

[4] *See, e.g., Artificial Intelligence*, OXFORD DICTIONARY, https://www.oxfordreference.com/view/10.1093/oi/authority.20110803095426960 [https://perma.cc/B6L2-JDQ4] ("The theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages."). For further definitions, see, for example, Shlomit Yanisky-Ravid & Xiaoqiong (Jackie) Liu, *When Artificial Intelligence Systems Produce Inventions: An Alternative Model for Patent Law at the 3A Era*, 39 CARDOZO L. REV. 2215, 2223 (2018).

Moreover, the changes that AI's evolution and proliferation will bring remain unforeseen. While some topics are in the spotlight—such as search algorithms, nursing robots, and self-driving cars—many aspects are still being discussed superficially, if at all. This particularly concerns the relevance of AI for innovative and creative activities and production, a field that is regulated by intellectual property (IP) law—but only insofar as *human beings* act as innovators, authors, or creators. Legal theory has only hesitantly accepted the challenges that the advent of AI will bring to IP. With respect to the protection of artificial creativity, the regulatory void is indeed dramatic. Copyright law is virtually devoid of rules and doctrines on AI. To mention but a few of the most pertinent questions: Can AI be "creative" in the sense that humans are? In other words, can a robot "create" a work of music, art, or literature? If yes, should works created by AI enjoy protection that is comparable or even equivalent to human-made works? How long should such protection last? And last but not least, who should own rights in AI-generated works?

These questions are far from fictional. Examples of so-called generative art or algorithmic art—i.e., works of art that are autonomously created by AI apparatuses—abound.[5] A very early example is AARON, a computer program from the 1970s that creates high-quality artistic paintings, many of which are indistinguishable from human-made art.[6] AARON's modern counterparts are no less impressive. Recently, an artificial neural network became famous for creating an algorithmic painting in the style of eighteenth-century portraits. The auction of an effigy of one "Edmond de Belamy" at Christie's brought $432,500—more than forty times the initially expected price.[7] In the field of music, the completion of unfinished symphonies of Franz Schubert (symphony no. 8) and Ludwig van Beethoven (symphony no. 10) by computer

[5] For a definition of the term, see, for example, Margaret A. Boden & Ernest A. Edmonds, *What is Generative Art?*, 20 DIGITAL CREATIVITY 21, 24 (2009).
[6] *See, e.g.*, Chris Garcia, *Harold Cohen and AARON—A 40-Year Collaboration*, COMPUTER HIST. MUSEUM (Aug. 23, 2016), https://www.computerhistory.org/atchm/harold-cohen-and-aaron-a-40-year-collaboration [https://perma.cc/C9NM-V67R].
[7] *See, e.g.*, *Edmond De Belamy*, OBVIOUS, https://obvious-art.com/edmond-de-belamy.html [https://perma.cc/FU8F-Y488].

algorithms caught public attention.[8] Finally, ever more kinds of literature are being written with the help of so-called natural language generation. Such AI is able to directly transform raw data into readable texts, such as business and stock market reports, weather forecasts, and newspaper articles.[9] There is no doubt that had humans created any of these emanations of AI activity, copyright protection would exist.

As these examples illustrate, we are at the dawn of a third technological cataclysm. Unlike in the first two technological revolutions, the issue at hand is not the accelerated *duplication* of creative works or their ubiquitous *dissemination* via the web. Rather, we are on the threshold of an age of *substitution* of human creativity by artificial creativity. Hence, the task that faces us is not about optimizing human output, but rather about determining whether humankind will retain its role as creator—that is, whether the human monopoly on artistic and informative contents will persist. As a consequence, not only are labor markets at the brink of disruption, but, in the long run, cultural contents and the public infosphere are facing fundamental changes. At the same time, we must not neglect the opportunities of artificial creativity. After all, AI innovation and the concomitant proliferation of creative production by AI may sooner rather than later—and more rather than less—contribute to our economic welfare.

Against this background, the importance of more legal analysis in the field is evident. Questions of whether and how to protect artificial creativity will soon become pressing. In 2016, Japan was the first (and so far only) country to commence legislative reform

---

[8] *See, e.g.*, Justin Huggler, *Computer Is Set to Complete Beethoven's Unfinished Symphony*, TELEGRAPH (Dec. 13, 2019), https://www.telegraph.co.uk/news/2019/12/13/computer-set-complete-beethovens-unfinished-symphony [https://perma.cc/33DT-KEM7]; John Kennedy, *How AI Completed Schubert's Unfinished Symphony No 8*, SILICON REPUBLIC (Feb. 22, 2019), https://www.siliconrepublic.com/machines/unfinished-symphony-no-8-ai-huawei [https://perma.cc/F7N6-2RVB].

[9] *See, e.g.*, Cade Metz, *Finally, a Machine That Can Finish Your Sentence*, N.Y. TIMES (Nov. 18, 2018), https://www.nytimes.com/2018/11/18/technology/artificial-intelligence-language.html [https://perma.cc/GC8D-AUKK]. For earlier examples, see Timothy L. Butler, *Can a Computer Be an Author—Copyright Aspects of Artificial Intelligence*, 4 HASTINGS COMM. & ENT. L.J. 707, 715 (1982); Robert C. Denicola, *Ex Machina: Copyright Protection for Computer-Generated Works*, 69 RUTGERS L. REV. 251, 257-64 (2016).

aimed at offering extended protection to works produced by AI.[10] Around the same time, the European Union (EU) Parliament called on the European Commission to define criteria under which "works produced by computers or robots" could be considered protectable by copyright law.[11] But not much has happened since then, whether in the EU or anywhere else. And not surprisingly, the academic debate still focuses on the *lex lata*—the law as it exists—if at all. But inaction is the wrong approach. For one, problems are sure to emerge from the uncertainty of practitioners and courts who, confronted with new and untested legal issues, are left to their own devices. Second, without at least a rudimentary statutory framework for the protection and regulation of artificial creativity, the development of large parts of the industry may be at risk of withering or of following a path that could ultimately prove irreversible.[12] Both prospects are alarming.

In this Article, I will first provide an overview of the technical realities of artificial creativity and explain the legal status quo with regard to the protection of AI-generated works in different jurisdictions. My focus will be on copyright and neighboring areas of intellectual property protection, namely the protectability of AI-generated products.[13] I will then critically analyze this doctrinal status with an eye toward various legal-philosophical, microeconomic, and macroeconomic considerations of artificial creativity regulation. Lastly, using this backdrop, I will outline a reconceptualization of structures for protecting AI creativity. This may serve as a blueprint for statutory reform in copyright law and, pending reform of the statutory framework, as a guideline for the

---

[10] *See, e.g.*, Julia Dickenson, Alex Morgan & Birgit Clark, *Creative Machines: Ownership of Copyright in Content Created by Artificial Intelligence Applications*, 39 EUR. INTELL. PROP. REV. 457, 460 (2017).

[11] European Parliament, *Report with Recommendations to the Commission on Civil Law Rules on Robotics, Committee on Legal Affairs* (Jan. 27, 2017), 2015/2103(INL), at 28.

[12] For the problem of regulating in a constantly and swiftly changing landscape, see, for example, Bengt-Åke Lundvall, *Introduction*, *in* SYSTEMS OF INNOVATION: GROWTH, COMPETITIVENESS AND EMPLOYMENT 61 (Charles Edquist & Marleen McKelvey eds., 2000). *See also* Tim W. Dornis, *Wigmorian Copyright: Law, Economics, and Socio-Cultural Evolution*, INTELL. PROP. Q. 159-80 (2018).

[13] A number of other aspects of AI creativity warrant closer analysis (but will not be addressed here). These include an analysis of when and how AI production may actually infringe on a prior work, who should then be held liable, and whether those actors may claim fair use (or other exceptions) as a defense. For some insights, see James Grimmelmann, *Copyright for Literate Robots*, 101 IOWA L. REV. 657 (2016).

handling of AI creativity under unfair competition law and the misappropriation doctrine.

Before starting, a few clarifying remarks are in order. First, my analysis concerns cases of "autonomous AI" only, and not the use of computers or other apparatuses as tools or instruments of human creativity.[14] Production that is merely supported by the use of a computer or software—e.g., desktop publishing, video editing, and the composition of digital music—is still due to the creative direction of a human actor. In this way, computer-aided production is no different from the use of pens for writing or cameras for photography. Accordingly, its results fall into the domain of human creativity and will seldom raise new copyright issues.

By contrast, autonomous AI output is produced independently and without direct human influence. This means that humans have no immediate bearing on the process of production. Technically, such a scenario requires that an AI apparatus—as the combination of hardware and software—has evolved beyond the confines of its initial conception, typically as a consequence of so-called processes of machine learning. Machine learning is a subfield of AI research. In essence, it deals with the conception and training of algorithms to identify structure and patterns in data and to apply this knowledge to new data.[15] As a starting point, it requires human input. This input

---

[14] The International Organization for Standardization defines "autonomy" in "Robots and robotic devices – Vocabulary" as the "ability to perform intended tasks based on current state and sensing, without human intervention." *Robots and Robotic Device —Vocabulary*, INT'L ORG. FOR STANDARDIZATION, https://www.iso.org/obp/ui/#iso:std:iso:8373:ed-2:v1:en [https://perma.cc/BX2Z-FA63]. For a general concept of autonomy, see GERALD DWORKIN, THE THEORY AND PRACTICE OF AUTONOMY 3 (1988). On autonomous AI creativity, see, for example, Daniel J. Gervais, *The Machine as Author*, 105 IOWA L. REV. (forthcoming 2020), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3359524 [https://perma.cc/4YUB-9HQY].

[15] *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, "Artificial Intelligence for Europe,"* COM (2018) 237 final, 10 (Apr. 25, 2018) [hereinafter *Artificial Intelligence for Europe*]. For an overview of machine learning, see, for example, M. I. Jordan & T. M. Mitchell, *Machine Learning: Trends, Perspectives, and Prospects*, 349 SCI. MAG. 255 (2015); Anders Krogh, *What are Artificial Neural Networks?*, 26 NATURE BIOTECHNOLOGY 195 (2008); Pat Langley, *The Changing Science of Machine Learning*, 82 MACHINE LEARNING 275 (2011); Dana S. Rao, *Neural Networks: Here, There, and Everywhere—An Examination of Available Intellectual Property Protection for Neural Networks in Europe and the United States*, 30 GEO. WASH. J. INT'L L. & ECON. 509, 511 (1997).

programs the AI algorithm, namely by setting its software architecture and feeding in a certain amount of data.[16] During the subsequent teaching and training phase, however, an "evolution" occurs. This evolution leads to a structuring and optimization of the data and may result in modifications to the algorithm's architecture.[17] The larger the degree of such AI evolution, the smaller the remaining human-AI connection. Ultimately, human input may still be discernible when looking at the AI's algorithm. Yet the 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.

A cursory look at the examples above—the Huawei composing algorithm or the painting algorithms in AARON and used for "Edmond de Bellamy"—illustrates that AI of this kind does exist. It may be questionable whether the artificial actor as such is "creative."[18] Yet there is no doubt that the human actors involved (namely the programmer, owner, and user) no longer exert an immediate influence on the AI's activity or on the result of this activity. None of the humans involved could predict the concrete outcome of the AI's production processes. The human-AI relationship in these scenarios thus rather resembles a parent-child relationship as opposed to a creator-tool one. Initially, of course, the child may seem like a "make" of its parents in terms of its inherited characteristics and acquired capacities. But as soon as the child starts to act in unforeseen ways, the parents no longer have a claim over its creations. Just as a parent is not the creator of a child's work, a human actor has no claim of creativity over the artificial output in our examples. In these cases, the AI apparatus is an independent and autonomous "actor," emancipated from human direction and supervision.[19]

---

[16] *See, e.g.*, Josef Drexl et al., *Technical Aspects of Artificial Intelligence: An Understanding from an Intellectual Property Law Perspective* 10-11 (Max Planck Institute for Innovation and Competition, Research Paper No. 19-13, Oct. 2019), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3465577 [https://perma.cc/8EFU-EQ8K]; *see also* sources cited *supra* note 15.

[17] *See* Drexl et al., *supra* note 16, at 5-6.

[18] For a more detailed discussion, see *infra* Section I.B.1.

[19] The fact that the link between AI production and human creativity has been broken is widely acknowledged. *See* sources cited *infra* note 21. But, for a complete rejection of the concept of "AI autonomy" (under the so-called

The output produced by such an autonomous AI is commonly called machine-authored or AI-generated.[20] In American scholarship, the produce of such creativity has aptly been termed "emergent works."[21] This notion fittingly implies the self-contained and unforeseeable nature of the production process. Throughout this

---

amanuensis doctrine), see Jane C. Ginsburg & Luke Ali Budiardjo, *Authors and Machines*, 34 BERKELEY TECH. L.J. 343, 402 (2018) ("Any apparent 'creativity' in a machine's output is directly attributable either to the code written by the programmers who designed and trained the machine, or to the instructions provided by the users who operate the machine. No machine is itself a source of creativity."). Against the backdrop of such a per se negation of the potential of AI creativity, it is only logical to also deny the relevance of AI for copyright doctrine. *See id.* at 405 ("[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. Rejecting the idea of 'machine authorship' requires no novel twists of doctrinal logic: as long as machines follow our instructions, they are incapable of being more than obedient agents in the service of human principals."); *see also id*. at 407 ("Copyright's long acceptance of the use of tools and amanuenses is the most appropriate lens through which to deal with the potential problems of machine creation.").

[20] In light of the foregoing, it is necessary to note that we should avoid defining autonomy as "a matter of scale." *But see* Jani McCutcheon, *The Vanishing Author in Computer-Generated Works: A Critical Analysis of Recent Australian Case Law*, 36 MELBOURNE U. L. REV. 915, 931-34 (2013); Ana Ramalho, *Will Robots Rule the (Artistic) World? A Proposed Model for the Legal Status of Creations by Artificial Intelligence Systems*, 21 J. INTERNET L. 11, 13 (2017). An AI apparatus either acts autonomously—i.e., without human intervention and supervision—or it is still dependent on creative input from a human actor. In the former case, the work is AI-generated. Human actors may modify the outcome by adding creative input. Yet the AI-generated product as such is a non-human creation. Quite differently, in the latter case of human input, no "autonomy" exists. The output will still depend on the human creativity involved. Without this naturally creative spark, no work would exist. Accordingly, there is no "more" or "less" autonomous AI. The contrary perspective of McCutcheon and Ramalho misinterprets the concept of "work" by sweepingly looking at the *combined* product—in which both human and AI creativity have been embodied—and describing this product as a "partly computer-generated work" (e.g., the combination of a creative melody (human) with creative harmonies, bass, and rhythms (AI)). In essence, however, such a work is a joint work that combines both human and AI creative input. *See infra* Section III.E.

[21] *See, e.g.*, Bruce E. Boyden, *Emergent Works*, 39 COLUM. J.L. & ARTS 377, 379 (2016) ("[W]orks of apparently creative expression that arise from the operation of a program but cannot be traced directly to a human source"); Margot E. Kaminski, *Authorship, Disrupted: AI Authors in Copyright and First Amendment Law*, 51 U.C. DAVIS L. REV. 589, 593 (2017); Robert Yu, *The Machine Author: What Level of Copyright Protection Is Appropriate for Fully Independent Computer-Generated Works?*, 165 U. PA. L. REV. 1245, 1247, 1254 (2017) ("[M]achine-authored work"); *see also* Colin R. Davies, *An Evolutionary Step in Intellectual Property Rights—Artificial Intelligence and Intellectual Property*, 27 COMP. L. & SEC. REV. 601, 608 (2011) ("[C]omputer generated works . . . where the AI computer, through its own efforts, is producing an independent piece of work.").

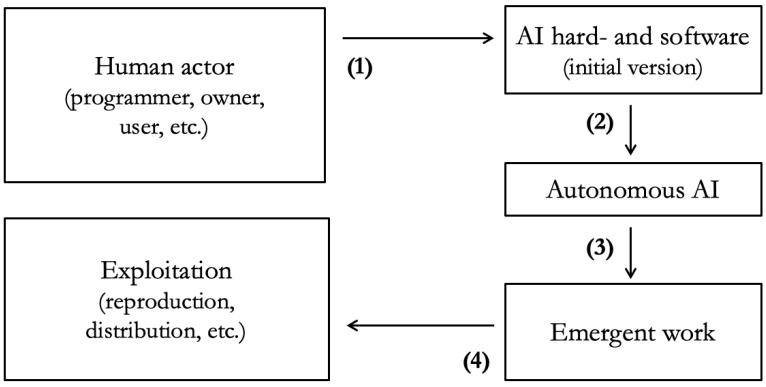
Article, I will therefore use the term emergent works, as well as AI-generated products.

Another aspect that needs to be clarified is the fact that AI may be both "innovative" in the sense of producing subject matter that can be patented and "creative" in the sense provided by copyright law. My focus is on the latter aspect of creative productivity, which is pertinent for issues of copyright and neighboring areas of protection. At the moment, creativity is still widely considered a quintessentially human capacity.[22] It is thus necessary to distinguish between normative and objective perspectives on creativity. While the former requires a human spark to exist, the latter looks at the result of an activity, regardless of its actor. I will use the term "creativity" according to its latter meaning, which means objectively denominating the fabrication of products that would be considered sufficiently creative and copyrightable had they been made by a human author or creator.

Finally, before we begin, a sketch of the various steps in the AI process is helpful (see figure 1). This process illustrates the chain of innovative and creative steps that are required for us to be able to speak of "artificial creativity" or an "emergent work." The first step concerns the (thus far) human production of an AI apparatus as an incident of technical innovation, including AI hardware construction and the programming of AI software (1). Unless the AI apparatus has been designed to act autonomously *ab initio*, it is the second step where the process of machine learning takes place. Here, AI overcomes the confines of its initial hard- and software conception and, so to speak, emancipates itself and its capabilities from its human maker (2). The third step concerns the autonomous production of an emergent work as the actual emanation of artificial creativity (3). The fourth and final step is concerned with exploitation. It is this last stage of reproduction, distribution, or any other variant of exploitation of the emergent work where issues of regulation—namely protection—come up (4).

[22] For more details, *see infra* Section I.B.1.

Figure 1.



I. STATUS QUO: TECHNOLOGY AND LAW

Current copyright doctrine reveals a paradox: whereas human-made works are protected under an increasingly extended system of copyrights and neighboring rights, the domain of AI creativity—although ever more elaborate—has remained unprotected. To start with, in recent decades, the threshold for the protection of human-made works has fallen continuously. And this inflation of human-creativity protection works in different directions.

On the one hand, the number of so-called related or neighboring rights, namely in European copyright, has steadily expanded—and consequently, subject matter that was once regarded as too insubstantial to warrant genuine copyright protection has been summoned under the umbrella of copyright statutes and their collection of *sui generis* rights.[23] Supplementary protection under the rubric of such lower-level entitlements covers phonograms and sound recordings, first fixations of films and broadcasts, certain databases, and previously unpublished works first published or communicated to the public.[24] On the other hand, the minimum requirements for the protection of creative artifacts as copyrightable works—with full authorial and moral rights—have sunk over time.

[23] JUSTINE PILA & PAUL TORREMANS, EUROPEAN INTELLECTUAL PROPERTY LAW 258-59 (2016). For the developments regarding neighboring rights in international copyright law and a comparative perspective, see PAUL GOLDSTEIN & P. BERNT HUGENHOLTZ, INTERNATIONAL COPYRIGHT: PRINCIPLES, LAW, AND PRACTICE § 6.2 (3d ed. 2013).

[24] *See, e.g.*, PILA & TORREMANS, *supra* note 23, at 284-89.

As a result, subject matter of even minuscule creativity (such as works of simple handcraft) has been promoted to the status of full copyright protection throughout the world.[25]

Meanwhile, the copyright protection of AI-generated works remains virtually unattainable due to the fact that *human* creativity is indispensable for such protection.[26] Protection for AI creativity must be rejected by definition, regardless of the quality of the subject matter. This historically anthropocentric foundation likely stems from romantic notions of authorship.[27] It not only makes it impossible to assign copyrights to computers or robots, but also restricts the assignment of rights to human actors. At first glance, the law of unfair competition may provide a fallback by protecting emergent works from unauthorized exploitation. But it is doubtful whether common-law misappropriation doctrine or equivalent concepts in continental unfair competition laws will be effective. In sum, the status quo is a regulatory vacuum.

A. Be Careful What You Ask For: The Rise of Artificial Creativity

Only a few aspects of the definition of AI are accepted across all disciplines. One of these is the insight that "intelligence" is not a homogeneous and uniform concept that can be assessed according to universally acknowledged standards. Rather, it is the sum of many components, including the capacity for "creativity."[28] And the nature of "creativity" is no less difficult to define. Like intelligence, creativity consists of many different components. It namely depends on whether the process or the result of creativity is new, appropriate,

---

[25] For a concise comparative overview, see GOLDSTEIN & HUGENHOLTZ, *supra* note 23, § 6.1.

[26] For a comparative perspective, see Sam Ricketson, *People or Machines: The Berne Convention and the Changing Concept of Authorship*, 16 COLUM.-VLA J.L. & ARTS 1 (1991) (explaining the foundation of a human-author paradigm in many national jurisdictions and in international copyright law).

[27] For the history and a critique of the romantic-author paradigm, see MARK ROSE, AUTHORS AND OWNERS 1, 49, *passim* (1993); Annemarie Bridy, *Coding Creativity: Copyright and the Artificially Intelligent Author*, 2012 STAN. TECH. L. REV. 1, 3; Gervais, *supra* note 14, at 22-25.

[28] *See, e.g.*, DAVID LEVY, ROBOTS UNLIMITED: LIFE IN A VIRTUAL AGE 149 (2005); FRANCISCO CÂMARA PEREIRA, CREATIVITY AND ARTIFICIAL INTELLIGENCE 1 (2007); 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, 679.

or useful.[29] In addition, it requires a minimum degree of randomness of the outcome as well as the actor's capacity to self-criticize and to change her behavior.[30] Moreover, a finding of creativity on the side of an artificially intelligent actor is often described as requiring autonomy and independence from the influence of human intelligence.[31]

The problem of an exact determination is prominently illustrated by a classical argument over the "true intelligence" of AI. The conflicting approaches can be characterized by their perspectives—one result-oriented, the other process-oriented. Alan Turing formulated the result-oriented conception of intelligence in 1950. This approach focuses on the output of AI systems.[32] A human being is called to be the referee. She communicates with two parties, unable to see who is who—one party is a human being and the other is an AI actor. If the referee, in communicating with the two sides, is ultimately convinced that the AI is a human being, the AI can be classified as truly "intelligent."

The opposite approach became known as John Searle's "Chinese Room Hypothetical."[33] Unlike Turing, Searle emphasized a requirement of intentionality as a prerequisite for actual intelligence. As he explained, intelligence cannot be attributed to an AI apparatus simply because it overcomes a result-oriented threshold under the Turing test. Output alone cannot be a sufficiently precise indicator since it may be the result of a simple mechanical compliance with rules that still lacks genuine consciousness.[34] Searle's example

---

[29] *See, e.g.*, PEREIRA, *supra* note 28, at 29; Roger Schank & Christopher Owens, *The Mechanics of Creativity*, *in* THE AGE OF INTELLIGENT MACHINES 394, 395 (Ray Kurzweil ed., 1990); Margaret A. Boden, *Computer Models of Creativity*, 30 AI MAG. 23, 24 (2009); Panagiotis G. Kampylis & Juri Valtanen, *Redefining Creativity—Analyzing Definitions, Collocations, and Consequences*, 44 J. CREATIVE BEHAV. 191, 198 (2010).

[30] MARGARET A. BODEN, THE CREATIVE MIND: MYTHS AND MECHANISMS 163, 233 (2d ed. 2004); PEREIRA, *supra* note 28, at 7; Yanisky-Ravid, *supra* note 28, at 679 (2017).

[31] OWEN FLANAGAN, THE SCIENCE OF THE MIND 255 (2d ed. 1991); Madeleine de Cock Buning, *Autonomous Intelligent Systems as Creative Agents Under the EU Framework for Intellectual Property*, 7 EURO. J. RISK REG. 310, 315-16 (2016); Ramalho, *supra* note 20, at 11, 13; Yanisky-Ravid, *supra* note 28, at 679-80.

[32] A.M. Turing, *Computing Machinery and Intelligence*, 59 MIND 433, 434 (1950).

[33] John R. Searle, *Minds, Brains, and Programs*, 3 BEHAV. & BRAIN SCI. 417, 417-18 (1980).

[34] *Id.* at 418; *see also* Lawrence B. Solum, *Legal Personhood for Artificial Intelligences*, 70 N.C. L. REV. 1231, 1267 (1992).

features a person in a room who does not understand or speak Chinese but who is able to apply formal rules for the formation of Chinese sentences. Since the person correctly "answers" questions in Chinese (which are formulated outside the room and handed to the individual) by using a rulebook inside the room, observers outside the room may get the impression that the person is proficient in Chinese. This, however, is only a simulation of skills generated by compliance with rules—there is no intentionality and hence no genuinely intelligent activity.

The same discrepancy between result- and process-orientation exists with respect to creativity. If one follows a result-oriented approach, many emergent works are likely to be considered comparable, if not equivalent or even superior to, human-made products. These products might thus prima facie be characterized as "works" in the sense of copyright. Indeed, a variant of the Turing test was recently undertaken at Rutgers University, where AI-generated products and human works (created for Art Basel) were presented for comparison. The test's human arbiters not only had problems distinguishing between human and artificial works but even sometimes felt that the latter were more appealing.[35]

The assessment is different if one considers the process of creation as such. As long as AI activity is strictly tied to rule-bound mechanisms, due to the unalterable confines of its programming, it can hardly be characterized as autonomous.[36] Necessarily then, the unfulfillable requirement of an outright mystical human consciousness persists. This is indeed an obstacle never to be overcome.[37] Yet a look at the technological development and the examples mentioned in the introduction shows that AI is increasingly emancipating itself from human reign.[38] At the moment, autonomy is due primarily to the fact that machine-

[35] HOLGER VOLLAND, DIE KREATIVE MACHT DER MASCHINEN 63 (2018).
[36] *See, e.g.*, Bridy, *supra* note 27, at 10.
[37] Schank & Owens, *supra* note 29, at 394; DAVID GELERNTER, THE MUSE IN THE MACHINE: COMPUTERIZING THE POETRY OF HUMAN THOUGHT 83 (1994) ("Creativity is a fascinating phenomenon and it has been studied endlessly … No master key has been discovered."). On the copyrightability issue, see also Gervais, *supra* note 14, at 45 ("[T]he creation process must be human."); Ginsburg & Budiardjo, *supra* note 19, at 402 ("Any apparent 'creativity' in a machine's output is directly attributable either to the code written by the programmers who designed and trained the machine, or to the instructions provided by the users who operate the machine. No machine is itself a source of creativity.").
[38] *See supra* Part I.

learning processes lead to an evolution of capacities beyond the initial conception of the algorithmic architecture. Our introductory example of "Edmond de Bellamy," a portrait painted by a so-called generative adversarial network, a special version of an artificial neural network, illustrates this point.[39] Such a network consists of two elements: a generator and a discriminator. The former part constantly generates new output (in our example, new synthetic portrait images), while the latter part then decides whether the output passes the threshold of authenticity. It does so by comparing the generator's make with a preexisting dataset of authentic pictures.[40] In the course of this adversarial game, both elements establish a double feedback loop. This initiates a dynamic and self-contained training process for both the generator and the discriminator. After each round of playing, both of the network's elements are incrementally different. Over time, evolving during an AI-internal and potentially eternal ping-pong match, the system as a whole will move away from the basic dataset and the algorithm's initial architecture. This may not yet qualify the system as a truly "intelligent" or "creative" entity. But there is no doubt that the output of such AI production processes is detached from human actors' initial input, namely the programmer's conception of the software and the user's data input. As a consequence, humans no longer immediately influence and determine the result. It is this unpredictability that justifies a characterization as autonomous.

John Searle, of course, would likely still contest the existence of genuine intelligence and creativity in such scenarios.[41] Yet the technological development has brought us to a point where we struggle to find a human creator. Indeed, it is possible for AI applications to write, compose, or paint without human input and nonetheless to perfectly replicate the results of human creativity. Most importantly, the results of such artificial creativity qualify as

---

[39] *See supra* text accompanying note 7.

[40] For the technical foundations of generative adversarial networks and details, see Ian J. Goodfellow et. al., *Generative Adversarial Networks* (June 10, 2014) (unpublished manuscript), https://arxiv.org/pdf/1406.2661.pdf [https://perma.cc/BWZ2-4YUG]. For a short explanation of the production process for "Edmond de Bellamy," see *Is Artificial Intelligence Set to Become Art's Next Medium?*, CHRISTIE'S (Dec. 12, 2018), https://www.christies.com/features/A-collaboration-between-two-artists-one-human-one-a-machine-9332-1.aspx [https://perma.cc/W6NJ-BKY4].

[41] *See supra* note 33 and accompanying text.

entertaining, informative, and inspiring—all traits that were once considered as exclusively belonging to humans.

And this technological status quo is likely not the final destination. Searle's critique may eventually lose its persuasive edge. Not only has detachment from human input as such led to an increasingly autonomous AI environment, but further advances in AI technology must be expected. The demystification of human intellect and creativity may no longer be too far away. Although many of today's prophesies are still a reading of tea leaves, in hindsight, much that seemed impossible some decades ago is now in everyday use. The internet may be the best example. Seen in this light, we must acknowledge the prospects of AI coming ever closer to mimicking the human brain and its functions.[42] Even though AI may never perfectly match all human capacities, the gap between artificial and natural intelligence will someday shrink beyond recognition. Taking further into account that under a biochemical and psychological perspective the human intellect and psyche must also be described as rule-bound and mechanical,[43] the once seemingly bright-line distinction between natural and artificial creativity becomes ever more dubious. If the human brain, in the words of AI pioneer Marvin Minsky, is nothing but a "meat machine,"[44] the dividing line between natural and artificial intelligence is indeed destined to blur in the not-too-distant future. Even today, the differences are often merely quantitative, not qualitative.

Overall, therefore, it can be said that the once clear distinction between natural and artificial intelligence has become fuzzy. With every further technological development and evolution, questions of AI autonomy, self-confidence, and emotionality will only become more pressing and complicated. In any case, with regard to the results of AI creativity—what we call emergent works—the once bright-line traditional distinction and separation of the categories is no longer correct.

---

[42] For the evolution with regard to artificial neural networks, see *supra* text accompanying notes 15 through 21.

[43] *See, e.g.*, PAMELA MCCORDUCK, MACHINES WHO THINK 70 (1979); Bridy, *supra* note 27, at 10-11; Aaron Sloman, *Motives, Mechanisms, and Emotions*, 3 COGNITION & EMOTION 217 (1987).

[44] *See, e.g.*, MCCORDUCK, *supra* note 43, at 70.

B. Hic Sunt Dracones: AI Creativity and IP Protection

A look at various jurisdictions reveals that emergent works remain unprotected under copyright law and that such works are rarely expressly considered protectable subject matter in neighboring areas. Copyright protection is rejected because of copyright law's anthropocentric foundation—a creator or author must be human in order for protectable subject matter to exist. While this anthropocentric element of copyright doctrine need not be rejected in principle, it does require a number of modifications. The assignment of genuine authorial copyrights may still be reserved for human-made creations. But this does not exclude alternative means of protection. This field has remained widely unexplored. Relevant issues concern the protection of emergent works under a doctrine of related or neighboring rights. In addition, a closer look at unfair competition doctrine could provide a backstop regime. This non-copyright alternative has also been woefully neglected to date.

1. The Romantic Myth: No Human, No Copyright

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. In practice, this means that without human contribution to a work—i.e., a contribution overcoming the obstacle of minimum creativity or originality—no copyright will emerge. The results of non-human creativity will fall into the public domain.

i) "Computer-Generated Works" in the United Kingdom

Only a few legal systems expressly regulate AI-generated creations. The United Kingdom's Copyright, Designs and Patent Act 1988 (CDPA) is the most prominent example.[45] Similar rules can be found in the laws of New Zealand, Hong Kong, India, and the Republic of Ireland.[46] Section 9(3) of the CDPA provides for a fiction of ownership. It reads, "In the case of a literary, dramatic,

[45] Copyright, Designs and Patents Act 1988 (UK).

[46] *Cf.* McCutcheon, *supra* note 20; Andres Guadamuz, *Do Androids Dream of Electric Copyright? Comparative Analysis of Originality in Artificial Intelligence Generated Works*, INTELL. PROP. Q. 169, 175 (2017).

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."[47] The term "computer-generated," as it is further (and somewhat contradictorily) explained in section 178 of the Act, "means that the work is generated by computer in circumstances such that there is no human author of the work."[48] Compared to a genuine authorial copyright, protection for computer-generated works has a limited scope, particularly with respect to the period of protection (fifty years)[49] and the denial of moral rights.[50]

Many details of the CDPA's protection scheme for computer-generated works await clarification. For example, it is uncertain which standard of originality should be set as the minimum threshold for protection.[51] It is also unclear what kind and degree of *human* participation is required with respect to the requirement of "arrangements necessary for the creation." Evidently, the norm provides a rather fact-specific rule. Depending on the circumstances, a copyright-holder can be the operator of a computer, the person providing input for its operation, or the programmer of the software.[52] In any event, what is essential is that a human actor has contributed ("undertaken an arrangement") something that is essential ("necessary") for the production of a computer-generated work. This, however, means that unless one wants to define the initial programming of an ever-evolving AI or the mere activation of its on/off switch as sufficient, cases of a truly autonomous AI would rarely fall under the provision. After all, if the AI is truly autonomous and there is no actual human input, the threshold requirement of setting an "arrangement" that is "necessary" will not be overcome.[53]

---

[47] Copyright, Designs and Patents Act 1988, c. I, § 9(3) (UK).
[48] *Id.* c. X, § 178. Whereas section 9(3) expressly determines a human author, section 178 denies her existence.
[49] *Cf. id.* c. I, § 12(7).
[50] *Cf. id.* c. IV, §§ 79(2)(c); 81(2).
[51] *See, e.g.*, LIONEL BENTLY & BRAD SHERMAN, INTELLECTUAL PROPERTY LAW 117-18 (5th ed. 2018).
[52] BENTLY & SHERMAN, *supra* note 51, at 128; Davies, *supra* note 21, at 609-10; Guadamuz, *supra* note 46, at 176; McCutcheon, *supra* note 20, at 959-60.
[53] Emily Dorotheou, *Reap the Benefits and Avoid the Legal Uncertainty: Who Owns the Creations of Artificial Intelligence?*, 21 COMPUTER & TELECOMM. L. REV. 85, 90-91 (2015); Ramalho, *supra* note 20, at 17-18.

ii) The American "Work-Made-for-Hire" Doctrine

In principle, the American approach to right owner determination is unconnected to aspects of author and creator personality. U.S. copyright law allows for corporate right ownership and for a largely free transfer of entitlements without the confines set by the civil-law system of authorial and moral rights.[54] This is a consequence of the utilitarian foundation of American copyright policies that have been—namely in the U.S. Constitution—designed with an eye toward the promotion of scientific progress and of creativity rather than the protection of authors' and creators' personalities.[55] Nevertheless, the requirement of a quintessentially *human* creativity is still upheld, with the threshold founded on doctrinal concepts of originality and creativity.

Originality, it is explained, is "[the] bedrock principle of copyright."[56] In addition to possessing "at least some minimal degree of creativity," a work must be original in the sense that it has been "independently created by the author."[57] For independence to be found (and to distinguish a true creation from the mere copying of existing material), the Supreme Court early on started to demand that the results of mental work be "the fruits of intellectual labor" that "are founded in the creative powers of the mind"[58] and are "original intellectual conceptions of the author."[59] Of course, boundaries for minimum creativity and originality meandered over time.[60] Up until today, however, the conviction has remained that beyond the mere effort and the actual economic value of the results, an emanation of intellectual labor and mindpower are required, and

---

[54] For a comparative analysis, see, for example, GOLDSTEIN & HUGENHOLTZ, *supra* note 23, §§ 7.1, 7.6.

[55] *Cf*. U.S. CONST. art. I, § 8, cl. 8 ("The Congress shall have power . . . to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries . . . ."). On the American utilitarian copyright tradition, see, for example, Kaminski, *supra* note 21, at 599. For more on the legal-philosophical aspects, *see infra* Section II.A.

[56] Feist Publications, Inc. v. Rural Telephone Service Co., Inc., 499 U.S. 340, 347 (1991); *see also* Edward Lee, *Digital Originality*, 14 VAND. J. ENT. & TECH. L. 919, 920 (2012).

[57] *Id*. at 345, 358, 362 (citations omitted).

[58] Trade-Mark Cases, 100 U.S. 82, 94 (1879).

[59] Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53, 58 (1884).

[60] For more details, see, for example, Bridy, *supra* note 27, at 5.

that these aspects indicate an indispensably *human* element of a creation.[61]

In copyright practice, accordingly, non-human creativity is also nonexistent. At a practical level, the U.S. Copyright Office prohibits the registration of works of non-human origin.[62] In terms of judicial practice, the courts have always insisted on a human author, particularly with regard to works "created" by animals.[63] Last, the technological evolution of non-human creativity has not led to a modification of the traditional concept.[64] In sum, U.S. copyright (as other systems) is still based on the concept of a natural person being the author or creator and, accordingly, the right-holder.[65]

---

[61] *See, e.g.*, Feist Publications, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 346-47 (1991) ("In *Burrow-Giles*, the Court . . . defined 'author,' in a constitutional sense, to mean 'he to whom anything owes its origin; originator; maker.' . . . As in *The Trade-Mark Cases*, the Court emphasized the creative component of originality. It described copyright as being limited to 'original intellectual conceptions of the author,' . . . and stressed the importance of requiring an author who accuses another of infringement to prove 'the existence of those facts of originality, of intellectual production, of thought, and conception.'"); *see also* Bridy, *supra* note 27, at 5; Annemarie Bridy, *The Evolution of Authorship: Work Made by Code*, 39 COLUM. J.L. & ARTS 395, 395 (2016); Daniel J. Gervais, *supra* note 14, at 16-17.

[62] *Cf.* U.S. COPYRIGHT OFFICE, COMPENDIUM U.S. COPYRIGHT OFFICE PRACTICES § 306 (3d ed. 2017) ("The U.S. Copyright Office will register an original work of authorship, provided that the work was created by a human being.").

[63] A recent example—and one of the few cases that has addressed issues of non-human authorship—concerns the famous monkey-selfie case in which the court denied copyright protection of animal-created pictures. *Cf.* Naruto v. Slater, No. 15-CV-04324-WHO, 2016 WL 362231, at *3 (N.D. Cal. Jan. 28, 2016), *aff'd*, 888 F.3d 418 (9th Cir. 2018) ("[T]he Copyright Act does not 'plainly' extend the concept of authorship or statutory standing to animals. To the contrary, there is no mention of animals anywhere in the Act. The Supreme Court and Ninth Circuit have repeatedly referred to 'persons' or 'human beings' when analyzing authorship under the Act.").

[64] No cases have been decided so far, and the U.S. Copyright Office (somewhat avoiding the issue of AI autonomy) clearly rejects registrability for "works produced by a machine or mere mechanical process that operates randomly or automatically without any creative input or intervention from a human author." *See* U.S. COPYRIGHT OFFICE, *supra* note 62, § 313.2.

[65] *See, e.g.*, Bridy, *supra* note 27, at 5; Bridy, *supra* note 61, at 395; Ralph D. Clifford, *Intellectual Property in the Era of the Creative Computer Program: Will the True Creator Please Stand Up?*, 71 TUL. L. REV. 1675, 1682 (1997); Pamela Samuelson, *Allocating Ownership Rights in Computer-Generated Works*, 47 U. PITT. L. REV. 1185, 1199 (1986). *But see* Karl F. Milde, *Can a Computer Be an Author or an Inventor?*, 51 J. PAT. OFF. SOC'Y 378 (1969); Ryan Abbott, *I Think, Therefore I Invent: Creative Computers and the Future of Patent Law*, 57 B.C. L. REV. 1079, 1098 (2016); Victor M. Palace, *What If Artificial Intelligence Wrote This? Artificial Intelligence and Copyright Law*, 71 FLA. L. REV. 217, 226-31 (2019).

Nevertheless, U.S. theory is devoid of the dogma of personality/work inseparability that governs in civil-law copyright.[66] It is thus also less formal with regard to the allocation of rights and, inter alia, allows for a separation of the person of the actual author or creator of a work (author-in-fact) from the author or creator in the legal sense (author-in-law). Indeed, under the "work-made-for-hire" doctrine, the employer or commissioner of the author or creator of a work is directly assigned copyrights in the work. There is no prior materialization of rights in the actual author or creator; the author-in-law is the one and only right-holder. This rule applies even in the absence of creative input from the employer or commissioner.[67] Because of the similarity of AI creativity to work-made-for-hire scenarios, scholars have suggested implementing the same mechanism for AI creativity. Details vary, but most commentators agree that rights to an emergent work (in the sense of a "work-made-by-AI") should be immediately acquired by the programmer or by the user of the AI.[68] Yet it also is generally agreed that the application of such a work-made-by-AI doctrine would require a statutory amendment to the Copyright Act. Analogous application of the work-made-for-hire rule is impossible.[69] Emergent works thus fall into the public domain, where they remain unprotected.[70]

iii) Continental Civil Law: Straight from Pygmalion's Atelier

Civil-law copyright mostly owes its anthropocentrism to its historical foundation of personality right theory. From this follows the paradigm of an inseparable link—an umbilical cord so to speak—between author personality and work. I will address legal-

---

[66] *Cf.* GOLDSTEIN & HUGENHOLTZ, *supra* note 23, §§ 2.1, 2.2 (comparing common law and civil law).
[67] *See* 17 U.S.C. §§ 101, 201(b) (2018).
[68] *See, e.g.*, Bridy, *supra* note 27, at 26-27; Bridy, *supra* note 61, at 400; Kalin Hristov, *Artificial Intelligence and the Copyright Dilemma*, 57 IDEA 431, 445 (2017); Palace, *supra* note 65, at 234; Yanisky-Ravid, *supra* note 28, at 705.
[69] Bridy, *supra* note 27, at 26-27; Bridy, *supra* note 61, at 400; Butler, *supra* note 9, at 741. *But see also* Hristov, *supra* note 68, at 445-47.
[70] Clifford, *supra* note 65, at 1698; Hristov, *supra* note 68, at 438; Palace, *supra* note 65, at 238; Yu, *supra* note 21, at 1270. *But cf. also* Samuelson, *supra* note 65, at 1224 (ultimately suggesting rights for the AI user but also saying of the public-domain solution that "[a]dmittedly, it is a radical suggestion, but at least a few points can be made in favor of it").

philosophical aspects in more detail later;[71] what is essential at this point is the fact that continental copyright also demands *human* input and creativity for rights to come into existence.

German copyright law provides an illustrative example. According to section 2(2) of the German Copyright Act, a "work" in the legal sense can only be a "personal intellectual creation."[72] By definition, the activity of a human person is required. This is why neither animals nor machines can create a work in the sense of the Act.[73] Similar concepts exist in other civil-law jurisdictions, such as Italy, where the Copyright Act defines protectable subject matter as "works of the mind having a creative character."[74] Hence, when an AI application is utilized for production, 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. In the latter case of AI autonomy, the spiritual connection between "work" and "creator" is deemed missing. Accordingly, no copyright accrues—even though the result may be sufficiently "creative."[75]

---

[71] *See infra* Part III.1.

[72] Gesetz über Urheberrecht und verwandte Schutzrechte [Urheberrechtsgesetz] [UrhG] [Copyright Act], Sept. 9, 1965, Teil I [BGBL I] at 1273 (Ger.) [hereinafter German Copyright Act], *translation at* https://www.gesetze-im-internet.de/englisch_urhg/englisch_urhg.pdf [https://perma.cc/N2NW-DT4C].

[73] Gernot Schulze, § 2, para. 8, *in* URHEBERRECHTSGESETZ: URHG – KOMMENTAR, (Thomas Dreier, Gernot Schulze & Louisa Specht eds., 6th ed. 2018); Winfried Bullinger, § 2, para. 15, *in* PRAXISKOMMENTAR ZUM URHEBERRECHT (Artur-Alex Wandtke & Winfried Bullinger eds., 4th ed. 2014); Ulrich Loewenheim, § 2, para. 39, *in* URHEBERRECHT – KOMMENTAR (Ulrich Loewenheim, Matthias Leistner & Ansgar Ohly eds., 5th ed. 2017); Karl-Nikolaus Peifer, *Roboter als Schöpfer – Wird das Urheberrecht im Zeitalter der künstlichen Intelligenz noch gebraucht?*, *in* URHEBERRECHT!: FESTSCHRIFT FÜR MICHEL M. WALTER ZUM 80. GEBURTSTAG 222, 227-28 (Silke von Lewinski & Heinz Wittmann eds., 2018); HAIMO SCHACK, URHEBER- UND URHEBERVERTRAGSRECHT § 9, para. 184 (8th ed. 2017); Sven Hetmank & Anne Lauber-Rönsberg, *Künstliche Intelligenz und Immaterialgüterrecht*, GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT (GRUR) 574, 575 (2018); Anne Lauber-Rönsberg, *Autonome "Schöpfung" – Urheberschaft und Schutzfähigkeit*, GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT (GRUR) 244, 245 (2019).

[74] Legge 22 aprile 1941, art. 1, n.633, G.U. July 7, 1941, n.166 (It.) ("[L]e opere dell'ingegno di carattere creativo ...").

[75] *See, e.g.*, Landgericht Berlin [LG Berlin] [District Court of Berlin] May 30, 1989, GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT [GRUR] 1990, 270, 270 – Satellitenfoto (Ger.); SCHACK, *supra* note 73, § 9, para. 184; Bullinger, *supra* note 73, § 2, para. 15; Loewenheim, *supra* note 73, § 2, para. 39; Peifer, *supra* note 73, at 226-27; Hetmank & Lauber-Rönsberg, *supra* note 73, at 577; Lauber-Rönsberg, *supra* note 73, at 245-46; Schulze, *supra* note 73, § 2, para. 8.

Unsurprisingly, this characteristic also dominates in EU copyright. No explicit requirement of a human creation exists, but several legal instruments—namely the Software, the Database, and the Term of Protection Directives—contain rules requiring "self-created" works of an "originator" that can be interpreted to require a quintessentially human creativity.[76] Moreover, the European Court of Justice also requires human-made input. In the court's *Infopaq* judgment, the issue was whether short excerpts of news articles qualified as copyrightable subject matter. As the court explained, single words do not qualify. However, sentences or even phrases do, under the condition that they are the "author's own intellectual creation."[77] In subsequent cases, this standard was extended to all kinds of works.[78] In *Painer*, a case concerning the protectability of portrait photographs, the court added the more specific requirement that an intellectual creation must "reflect the author's personality."[79] Holding in favor of the photographer, it explained that the existence of such a reflection requires the author's "free and creative choices," as well as the ability to "stamp the work created with his 'personal touch.'"[80]

In sum, common-law and civil-law copyright widely adhere to a classic, perhaps even romantic, concept of the human author. Such anthropocentrism has two consequences. First, non-human and artificial actors or entities cannot own rights, at least in principle. Second, more specifically, in all legal systems, a practically insurmountable barrier to protecting non-human and artificial

[76] *See* Council Directive 2009/24, art. 1(3), 2009 O.J. (L 111) 16, 18 (EC); Council Directive 96/90, art. 3(1), 1997 O.J. (L 13) 24, 25 (EC); Council Directive 2006/116, art. 6, 2006 O.J. (L 372) 12, 14 (EC). Similar references to the implicit assumption of human authorship can be found in the preparatory materials, such as in the *Proposal for a Council Directive on the Legal Protection of Databases*, COM (1992) 24 final, 44 (May 13, 1992), and the *Proposal for a Council Directive on the Legal Protection of Computer Programs*, COM (1988) 816 final, 20 (Mar. 17, 1989).

[77] Case C-5/08, Infopaq International, ECLI:EU:C:2009:89, at paras. 37-48 (2009).

[78] *See, e.g.*, Case C-310/17, Levola Hengelo BV v. Smilde Foods BV, ECLI:EU:C:2018:618, at paras. 36-37 (2018).

[79] Case C-145/10, Eva-Maria Painer v. Standard VerlagsGmbH & Others, ECLI:EU:C:2011:798, at paras. 88-94 (2011).

[80] *Id.* paras. 90-94. For an overview, see Jean-Marc Deltorn & Franck Macrez, *Authorship in the Age of Machine Learning and Artificial Intelligence* 8-9 (Ctr. for Int'l IP Studies Research Paper No. 2018-10, Oct. 2018).

creativity exists given that the existence of rights and protection requires human input of minimum creativity as a *sine qua non*.

2. Holey Gap-Filler: Neighboring Rights and Design Protection

In addition to genuine authorial copyrights, European doctrine has come to acknowledge and implement so-called related or neighboring rights—a category of lower-level entitlements covering products such as phonograms and sound recordings, first fixations of films and broadcasts, and certain databases.[81] Unlike authorial copyright, protection of this kind does not require a "personal intellectual creation" and, therefore, seems to lack the requirement of a specific *human* record, film, database producer, or manufacturer. Certain categories of emergent works thus seem to be protected under these provisions.[82]

On closer inspection, however, doubts arise. In the past, European courts confronted with issues of neighboring rights for photographs did actually call for a human photographer (read: creator). They were not content with non-human production.[83] In the same vein, scholarship refers to the so-called creator principle, which is understood to require a human actor.[84] Seen in this light, protection for emergent works is anything but guaranteed.

Moreover, many manifestations of artificial creativity would fall between the cracks of the existing neighboring rights regime. This system is holey by definition since it merely fills the gaps of traditional copyright law. Paradoxically, less creative emergent works such as sound recordings or databases might be covered, yet

---

[81] See *supra* text accompanying notes 23 and 24.

[82] For example, one may think of AI-generated records and sound recordings, photographs and films, or databases. *See, e.g.*, Davies, *supra* note 21, at 618 ("[S]ui generis right."); Hetmank & Lauber-Rönsberg, *supra* note 73, at 578-79; Lauber-Rönsberg, *supra* note 73, at 248.

[83] *See, e.g.*, Landgericht Berlin [LG Berlin] [District Court of Berlin] May 30, 1989, GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT (GRUR) 1990, 270, 270 – Satellitenfoto (Ger.); österreichischer Oberster Gerichtshof [öOGH] [Oberster Gerichtshof] Feb. 1, 2000, ZEITSCHRIFT FÜR URHEBER- UND MEDIENRECHT - RECHTSPRECHUNGSDIENST (ZUM-RD) 2001, 224, 227 (Austr.).

[84] *Cf.* German Copyright Act, *supra* note 72, § 7; *see also* Schulze, *supra* note 73, § 72 para. 33; Dominik König & Benjamin Beck, *Die immaterialgüterrechtliche Schutzfähigkeit von* "*Affen-Selfies*," 60 ZEITSCHRIFT FÜR URHEBER- UND MEDIENRECHT (ZUM) 34, 36-37 (2016).

works displaying higher creativity, such as AI music or generative art, would still remain in a normative vacuum and lack protection. In sum, the existing regime of neighboring rights is not designed to cater to issues of artificial creativity and its protection.

In addition, a court dealing with the issue of protection for emergent works might end up looking for IP rights beyond the sphere of copyright law. In that regard, design or design-patent protection might be considered most eligible, at least if the emergent work at issue is a "product" in the sense of an "industrial or handicraft item" within the meaning of European design law,[85] or an "article of manufacture" as required for U.S. design patent protection.[86] Yet with respect to design rights and design patents, the norms on ownership—as in copyright doctrine—are usually interpreted to require a human being as the designer or inventor.[87]

3. The Path Untrodden: Misappropriation Doctrine

Finally, beyond copyright, related, or neighboring rights, and design or design patent protection, the law of unfair competition may appear to offer a doctrine of last resort. As far as I can see, unfair competition protection has thus far not been an issue in practice and has only seldom been addressed in theory—and not in much detail.[88] Indeed, the lack of precedents and the disputed economics of AI creativity (which I will address in more detail soon[89]) make it rather unlikely that unfair competition law will provide a workable system of emergent work protection. Nevertheless, as a closer look reveals, misappropriation doctrine is not unfit for providing basic protection for emergent works.

---

[85] *See* Council Regulation 6/2002, art. 3, 2002 O.J. (L 3) 1 (EC).
[86] *See* U.S. Patent Act, 35 U.S.C. § 171 (2018).
[87] German and European design law have explicitly expressed the quintessence of a *human* designer. *See, e.g.*, Helmut Eichmann, § 7 para. 4, *in* DESIGNGESETZ: GESETZ ÜBER DEN RECHTLICHEN SCHUTZ VON DESIGN (Helmut Eichmann & Marcus Kühne eds., 5th ed. 2015).
[88] For U.S. law (limited to cases of machine-authored texts and news articles), see Yu, *supra* note 21, at 1266-68. A very frugal, general discussion can be found (for the UK) in BENTLY & SHERMAN, *supra* note 51, at 118 ("[T]here is no reason why such production could not be protected by related rights or unfair competition law.").
[89] *See infra* Section II.B.

If AI creativity is exploited—for example, by replication of AI music or AI paintings—it is not far-fetched to assume that a case of misappropriation is at play. After all, exploitation of another's work—even if this other is artificial—can be considered an appropriation of commercial values. However, additional elements of "unfairness" must be considered in order to determine whether a case also is a case of *mis*appropriation. The qualitative requirement of unfairness varies across jurisdictions.

In American law, misappropriation doctrine can be explained as a traditional common-law instrument protecting against copying. It covers cases where a person imitates or duplicates a work developed by another.[90] The doctrine's foundations can be traced to the Supreme Court's 1918 *International News Service v. Associated Press* decision.[91] The case concerned the copying of information from news dispatches in New York City (with news on the World War I front). The International News Service (INS) copied Associated Press (AP) bulletins and immediately transferred the news to its West Coast affiliates and subscribers—and sometimes even earlier than INS (which was possible due to the difference in time zones). The AP raised no claims of copyright infringement or trade secrecy protection. The issue was misappropriation. In this regard, the Supreme Court acknowledged the public's right to copy the uncopyrighted news reports but held that—vis-à-vis INS as a competitor—the AP had a "quasi-property right" in its "hot news" from Europe and enjoined INS's copying as an unfair reaping of "the harvest of those who have sown."[92]

The scope of this doctrine has been contested since the Supreme Court's ruling. Although courts have extensively referred to the INS doctrine, they have been hesitant to incorporate it into the states' common law.[93] Not only is the doctrine seen as limited to the facts of the case,[94] but courts and scholars also refer to the need for

---

[90] Jane C. Ginsburg, *Copyright, Common Law, and Sui Generis Protection of Databases in the United States and Abroad*, 66 U. CIN. L. REV. 151, 157 (1997).
[91] Int'l News Serv. v. Associated Press, 248 U.S. 215 (1918).
[92] *Id*. at 239-40.
[93] Douglas G. Baird, *Common Law Intellectual Property and the Legacy of* International News Service v. Associated Press, 50 U. CHI. L. REV. 411, 415-23 (1983).
[94] *Id.* at 422-23; 3 RUDOLF CALLMANN, CALLMANN ON UNFAIR COMPETITION, TRADEMARKS & MONOPOLIES § 15.3 (4th ed. 2018) ("It has been repeated ad nauseam that INS 'is authority only for the situation there at the bar.'").

"competition" between the parties. In other words, it is essential that the plaintiff and defendant be competing in the marketplace with respect to the specific subject matter that has allegedly been misappropriated. Mere unjust enrichment of the defendant will not suffice.[95] The Restatement (Third) of the Law of Unfair Competition has also curbed the doctrine's domain. As the Restatement explains, absent elements of trade-secrecy invasion, passing-off, right-of-publicity, or common-law copyright violation, no "general rights against the appropriation of information and other intangible trade values" exist.[96] In short, beyond IP protection, gap-filling is an absolute exception. There is no residual common-law tort of misappropriation.[97]

The picture is not too different in European and civil-law unfair competition law. Here, beyond the field of IP rights protection, the issue of unfairness of copying, imitation, and replication depends on whether utilization and exploitation of another's work can be regarded as deceptive vis-à-vis third parties (namely consumers) or as a misappropriation of another's (namely a competitor's) goodwill.[98] On this basis, mere exploitation of an emergent work as such—e.g., by copying or distribution—will rarely qualify as deception or goodwill misappropriation. As long as the work's replication is not marketed as an "original" and as long as the work at issue or the AI producing it has not acquired a specific reputation, image, or goodwill in the marketplace, no claim of unfairness exists.

Further, misappropriation prevention beyond the domain of deceptive and goodwill-appropriating conduct is handled very

---

[95] *See, e.g.*, RESTATEMENT (THIRD) OF THE LAW OF UNFAIR COMPETITION § 38, cmt. b (AM. LAW INST. 1995) ("There is no general common law prohibition against benefiting from the efforts of others."); *see also* Emerson v. Davies, 8 F. Cas. 615, 619 (C.C.D. Mass. 1845); WCVB-TV v. Boston Athletic Ass'n, 926 F. 2d 42, 45 (1st Cir. 1991); Leo J. Raskind, *The Misappropriation Doctrine as a Competitive Norm of Intellectual Property Law*, 75 MINN. L. REV. 875, 896-905 (1991). For numerous references to additional case law, see CALLMANN, *supra* note 94, § 15.4.

[96] *See* RESTATEMENT (THIRD) OF THE LAW OF UNFAIR COMPETITION § 38, cmt. b.

[97] *Id*.

[98] For goodwill being the essence of passing-off, see, for example, CHRISTOPHER WADLOW, THE LAW OF PASSING-OFF: UNFAIR COMPETITION BY MISREPRESENTATION paras. 3-1 to 3-20 (5th ed. 2016). For European and German law, as well as comparative perspectives, see Tim W. Dornis, § 4, paras. 18-47 (comparative law), 48-98 (economic analysis), 203-43 (confusion and misappropriation), *in* UWG-GROßKOMMENTAR (Karl-Nikolaus Peifer ed., 3d ed. 2019).

hesitantly both by courts and scholars. German law may serve as an example. According to the Federal Court of Justice's *Hartplatzhelden.de* decision, the fact that a plaintiff provides a service (there, the organization of an amateur football league) that the defendant appropriates (by running an ad-supported website where amateur football videos from the league can be uploaded) warrants no protection. There may exist an element of appropriation—even enrichment—since the defendant uses the plaintiff's management of a football league as the basis for generating ad-based income on its website. But the defendant's utilization of the plaintiff's services does not constitute actionable *mis*appropriation.[99] What ultimately matters, the Federal Court explained, is whether the defendant's appropriation conjures a risk that the plaintiff will no longer be able to produce and offer the original goods or services at issue. In short, a claim exists only where a risk of market failure looms.[100] Obviously, the existence of such a risk is specific to each case and depends on the context and the parties' and the marketplace's specific circumstances. While it likely suffices for a plaintiff to prove that she may have to leave her primary market as a consequence of the defendant's exploitation of her work, this is by no means certain for less drastic consequences. The *Hartplatzhelden.de* case itself provides a lively illustration of the complexities of cases in the gray zone. The Federal Court ultimately rejected a misappropriation claim on the grounds that the defendant's activities did not impair the plaintiff's organization of a football league.

The situation resembles scenarios that American courts have ruled on, such as the Second Circuit's *NBA v. Motorola* case, in which the exploitation of a primary product (the organization of sports events

---

[99] Bundesgerichtshof [BGH] [Federal Court of Justice] Oct. 28, 2010, GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT [GRUR] 2011, 436 (438) (Ger.); Bundesgerichtshof [BGH] [Federal Court of Justice] Nov. 19, 2015, GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT [GRUR] 2016, 725 (728) – Pippi-Langstrumpf-Kostüm II (Ger.); Ansgar Ohly, *Hartplatzhelden.de oder: Wohin mit dem unmittelbaren Leistungsschutz?*, GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT (GRUR) 487, 491 (2010).

[100] *See, e.g.*, Bundesgerichtshof [BGH] [Federal Court of Justice] Nov. 19, 2015, GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT [GRUR] 2016, 725 (728) – Pippi-Langstrumpf-Kostüm II (Ger.). For a general analysis of the market-failure paradigm, see, for example, Dennis S. Karjala, *Misappropriation as a Third Intellectual Property Paradigm*, 94 COLUM. L. REV. 2594, 2602-08 (1994); Richard A. Posner, *Misappropriation: A Dirge*, 40 HOUS. L. REV. 621, 627, *passim* (2003).

for live attendance and broadcasts) by a second-comer in a different market (the transmission of factual information on the results) was not considered significant enough to constitute actionable misappropriation.[101] Not surprisingly, academic analyses (namely an article by Judge Posner) suggested limiting the doctrine's scope to the bright-line test of whether the defendant's conduct is "likely to kill the goose that lays the golden eggs."[102] In other words, apart from the most dramatic cases involving a plaintiff's complete displacement and market exit, no claim will exist.

Seen in this light, it is evident that the protection of emergent works under misappropriation doctrine might be an uphill battle in any jurisdiction. A cursory look at the legal-economic discussion on the protection of AI-generated products—an in-depth analysis will follow[103]—clarifies that, overwhelmingly, AI creators are deemed not to need rights beyond their entitlements in the AI's soft- and hardware. Rights in emergent works are considered an over-payment as opposed to an economic necessity.[104] Accordingly, it is unlikely that emergent work exploitation will ever be enjoined as unfair misappropriation.

We can therefore conclude that emergent works are currently nowhere protected by authorial copyright. While copyright protection in the United States is practically nil, European scholarship suggests recourse to the system of related or neighboring rights, although this approach is incomplete at best. Overall, the personality rights foundation and the romantic ideal of the human author and creator make copyright and related rights protection ineffective. Unfair competition doctrine, while a valid fallback in theory, does not provide a solid instrument of protection. Not only is case law scarce, but the economic necessity of protection, albeit hotly debated, has not been sufficiently analyzed.

---

[101] NBA v. Motorola, Inc., 105 F.3d 841 (2d Cir. 1997).
[102] *See* Posner, *supra* note 100, at 629, 637, *passim*.
[103] *See infra* Section II.B.
[104] *See, e.g.*, Samuelson, *supra* note 65, at 1207-08. For perspectives from Europe, see, for example, Davies, *supra* note 21, at 610; Ramalho, *supra* note 20, at 20.

II. CRITIQUE AND ANALYSIS

To justify the refusal of rights protection for emergent works, a number of concerns have been put forward. Most critiques are based on legal philosophy and economics. Occasionally, the refusal of protection also expresses a deeper discomfort with AI creativity in general. However, as a closer look unveils, none of these legal-philosophical or economic arguments requires sending emergent works into the public domain—to the contrary, under an economic perspective, protection is in fact strongly indicated.

A. Philosophical Shadow-Boxing, or Why Artificial Creativity Is Protectable

Roughly speaking, there are two fundamental philosophies of IP law. One is the work-labor theory based on natural law, and the other (mostly in copyright) is the rubric of personality and moral rights protection.[105] Quite confusingly, when protection for emergent works is at issue, it has almost become common to rely on a blended combination of the two theories—a natural-law-and-personality-rights justification—and, not very surprisingly, to deny protection for want of *human* labor and *human* personality in the production of emergent works.[106] In order to avoid the confusion of over-simplification, a more nuanced analysis is required.

The work-labor theory is commonly traced to John Locke.[107] A Lockean natural rights strain has been deeply incorporated into the common-law copyright tradition. One oft-enunciated early example is Lord Mansfield's arguments in *Millar v. Taylor* explaining the justness of the principle that "an author should reap the pecuniary profits of his own ingenuity and labour."[108] In civil-law doctrine, namely in German law, a distinct natural rights concept was first

---

[105] For a concise comparative overview, see GOLDSTEIN & HUGENHOLTZ, *supra* note 23, at 14-22.
[106] *See, e.g.*, Lauber-Rönsberg, *supra* note 73, at 250-51; Ramalho, *supra* note 20, at 19-20.
[107] 2 JOHN LOCKE, TWO TREATISES OF GOVERNMENT, chapter V, para. 26 (J.M. Dent & Sons Ltd. 1962); *see also* ROBERT NOZICK, ANARCHY, STATE, AND UTOPIA 178 (1974); Wendy J. Gordon, *A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property*, 102 YALE L.J. 1533, 1544-45 (1993).
[108] Millar v. Taylor (1769), 98 Eng. Rep. 201, 252; 4 Burr. 2303, 2398.

embodied in the so-called work-and-creation theory (*Arbeits- und Schöpfungstheorie*) of the eighteenth and nineteenth centuries.[109] Property rights in general—and intellectual property in particular—should be considered as providing for remuneration for the author's work and effort. As German law professor and jack-of-all-trades Josef Kohler put it in 1880, "The philosophic foundation of real and immaterial property is the actual work, more correctly, the creation of goods; who creates a good has the natural right to it."[110] This approach, though not always openly admitted, has dominated theory and practice to this day. Even the German Federal Court of Justice at least once uncloaked itself when it explained that the grant of a copyright as such was already justified by the "nature of the matter" and that the legislature provided only for a positive recognition of natural rights and the practical design of the formal privilege.[111]

With respect to emergent works, work-labor theorists argue that no rights can ensue from AI creativity. Since it is not the human but the artificial actor who is "working," the concept of work-for-merit is considered inapplicable.[112] Yet this per se rejection is oversimplified. A "pure" natural-law conception must not be used to justify right ownership of artificial actors. Of course, seventeenth-century philosophers were referring exclusively to natural persons—but this does not exclude the AI's creator or other actors from acquiring rights on the basis of the right-for-labor paradigm. After all, the ultimate product of AI creativity can (and must) be traced back to an initial human input and contribution—a *sine qua non* condition. Without the "creation" of productive and creative AI *by a human* and the setting of circumstances for AI creativity *by a human*, no emergent works would exist. A look at movable and real property helps illustrate this point. The owner of a pregnant animal, for example, necessarily also becomes the owner of the litter (at least as Locke would have argued). Those who plant and grow an orchard will receive not only the first harvest; as long as they remain in possession of the orchard, they will be naturally allowed to enjoy

---

[109] *See, e.g.*, JOSEF KOHLER, DAS AUTORRECHT: EINE ZIVILISTISCHE ABHANDLUNG 99, 112 (Kessinger Publishing 2010) (1880); EUGEN ULMER, URHEBER- UND VERLAGSRECHT 54, 105 (3d ed. 1980).
[110] KOHLER, *supra* note 109, at 98 (author's translation).
[111] Bundesgerichtshof [BGH] [Federal Court of Justice] May 18, 1955, GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT [GRUR] 492, 1955 (Ger.); *see also* ULMER, *supra* note 109, at 105.
[112] *See* Boyden, *supra* note 21, at 391; Ramalho, *supra* note 20, at 19.

and utilize subsequent yields.[113] Therefore, a natural-law perspective hardly justifies rejecting protection for emergent works per se.

With respect to the other foundational theory, the personality-rights concept, the scenario is different. Here, the paradigm of an inseparable person-work connection complicates right allocation to an author-in-law instead of an author-in-fact. The conception of a Pygmalion-like relationship between the author or creator and her work is predominantly attributed to Immanuel Kant and Georg Wilhelm Friedrich Hegel.[114] These philosophers are credited for having formulated the idea that property, particularly intellectual property, serves individual expression and human self-actualization. Granting an author a range of inalienable rights—whether personal or economic—in every aspect of her work is seen as essential for a human's ability to interact with her environment and sociocultural reality.[115] Under this perspective, emergent works appear barely worthy of protection.[116] For now at least, we seem to agree that there is no "personality" in AI and that there is nothing to protect or to foster or develop. Moreover, due to AI's autonomy in creative production, all of the human actors involved (e.g., programmers) are physically removed and factually disconnected from the emergent work.

However, here as well, a few more nuances are required. Even under a personality-rights prism, protection can be denied only in part. While a genuine authorial copyright (including moral rights) will never emerge—since the human element is missing from the creative process—lower-level protection is possible, such as related or neighboring rights. Such rights are not founded on the classic paradigm of romantic authorship. Of course, in most jurisdictions,

---

[113] *See also* KOHLER, *supra* note 109, at 102; Justin Hughes, *The Philosophy of Intellectual Property*, 77 GEO. L.J. 287, 317 (1988). For the close interrelation between natural rights and utilitarian concepts in copyright history, see GOLDSTEIN & HUGENHOLTZ, *supra* note 23, § 2.1.

[114] *See, e.g.*, ULMER, *supra* note 109, at 109; William Fisher, *Theories of Intellectual Property*, *in* NEW ESSAYS IN THE LEGAL AND POLITICAL THEORY OF PROPERTY 168, 171-72 (Stephen R. Munzer ed., 2001).

[115] *See, e.g.*, FRANCIS J. KASE, COPYRIGHT THOUGHT IN CONTINENTAL EUROPE: ITS DEVELOPMENT, LEGAL THEORIES AND PHILOSOPHY: A SELECTED AND ANNOTATED BIBLIOGRAPHY 10-11 (1967); Ramalho, *supra* note 20, at 19.

[116] Boyden, *supra* note 21, at 391; McCutcheon, *supra* note 20, at 963-64; Ramalho, *supra* note 20, at 19; Yanisky-Ravid, *supra* note 28, at 706-07; Yanisky-Ravid & Liu, *supra* note 4, at 2244-45.

they can be found in copyright statutes and their protection is akin to copyrights. But that is due to their history as add-ons and amendments of protection for creative and similar products. With respect to their character, it is clear that neighboring rights are liberated from the requirement of a human creator or author.[117]

In sum, neither a natural-law perspective nor the concept of personality rights justifies sending emergent works into the public domain. There still remains the option of granting related or neighboring rights protection—even if copyright doctrine's personality-rights orientation is to be preserved.

B. Economic Analysis and Its Shallows

Even when scholarly analyses do not reject protection for emergent works on legal-philosophical grounds, they usually do by reference to the economic underpinnings of AI and creativity. However, a closer look at such economic reasoning reveals the lack of a reliable basis for policy- and lawmaking, for these arguments largely neglect and misinterpret the economics of IP protection and their relevance for AI creativity.

1. Lawyers' Stepchild: The Economic Model of Copyright Protection

When it comes to a policy analysis of emergent work protection, the relevance of the economic model is regularly openly rejected. In many cases, though, the model's incentive mechanism is simply misunderstood.

To start with the most evident fallacy, part of the scholarly literature regularly limits its analyses to the *benefits* of AI creativity for the general public. This camp focuses on the welfare effects of emergent works' availability as unprotected subject matter in the public domain.[118] In doing so, proponents of this approach correctly acknowledge that there is a positive effect on public welfare in

[117] *See also* de Cock Buning, *supra* note 31, at 321; Peifer, *supra* note 73, at 227-28.
[118] *See, e.g.*, Ramalho, *supra* note 20, at 20-21; Yanisky-Ravid, *supra* note 28, at 702-03; Yu, *supra* note 21, at 1266.

expanding access to creative products in general. If emergent works are freely accessible, maximum supply and minimum prices are guaranteed—in economic terms, there is static efficiency. However, limiting the analysis to freedom of access neglects the fact that the public is also interested in the continuous production of creative works. This is called dynamic efficiency. Such efficiency requires having incentives for potential creators and authors. This is why lawmakers grant IP rights.[119] Inevitably, of course, rights reduce static efficiency because their owners can limit output and access and raise prices. Yet too little legal protection—a consequence of the public-good character of creative works—inevitably leads to underproduction.[120] In other words, without protection against copying, authors and creators can expect imitators to exploit their works at virtually zero cost. Hence, the prospects for authors to recoup their investment are dim, which means they have less incentive to create in the first place. Ultimately, the public will suffer from this overall lack of creativity. Establishing an adequate balance between the granting of rights and the free accessibility of creative products is therefore essential.

With respect to emergent works, the equation is the same. Hence, the overall benefit of a per se refusal of protection for AI creativity is highly doubtful. A balanced approach requires an accounting of *all* costs and benefits ensuing from the protection or non-protection of emergent works. To date, the discussion has been incomplete, especially when the focus is merely on the benefits of "free AI creativity," while disregarding the detrimental effects of underprotection.

But further misconceptions exist even under more balanced analyses. A particularly confusing aspect of such obfuscation is the argument that the economic model's incentive paradigm could never apply with respect to AI creativity because computers, robots, and algorithms are not susceptible to economic stimuli.[121] Of course,

---

[119] *See generally* WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW 12-16 (2003).

[120] *See* ROBERT B. COOTER JR. & THOMAS ULEN, LAW AND ECONOMICS 104-06 (6th ed. 2014). For copyright protection more specifically, see, for example, Dornis, *supra* note 12, at 159-80.

[121] *See, e.g.*, Butler, *supra* note 9, at 739 n.171; Clifford, *supra* note 65, at 1701; Arthur R. Miller, *Copyright Protection for Computer Programs, Databases, and Computer-Generated Works: Is Anything New Since CONTU?*, 106 HARV. L.

AI's indifference to specific human motivations and emotions cannot be denied (at least so far). Today's computers and robots are not interested in money, spare time, or appreciation. Nevertheless, the outright negation of incentive effects obscures the relationship between the *creation of* AI and the ensuing *creativity by* AI. What is crucial to the overall level of creative production—of and by AI—is the incentive for the human innovators in the AI industry.[122] Only if their incentive level is adequate will they innovate and produce the optimal number of AI applications and, accordingly, the optimal amount of emergent works. In other words, the incentive analysis must still focus on the human actors who are the innovators and producers of autonomous AI that, in turn, produces emergent works.

Yet even if analyses correctly take the formal model of IP protection as their starting point and properly focus on the human AI creator's incentives, the perspective is often still too narrow. This is due to the argument that AI creators are often seen as already having sufficient incentives to innovate on the basis of their rights *in* the AI (i.e., in software and hardware). Beyond copyright protection for software (and potential rights in the hardware), as is commonly argued, further rights—namely copyrights or other entitlements—need not be assigned in emergent works.[123] Otherwise, it is said, the human AI creators would be "paid twice" and "over-rewarded."[124]

This over-reward hypothesis reveals the most glaring neglect of the economic underpinnings. Of course, the formal economic model and the workings of the incentive mechanism may not be undisputed in copyright doctrine. Industries and sectors of the market do exist

---

REV. 977, 1066 (1993); Palace, *supra* note 65, at 234; Ramalho, *supra* note 20, at 20; Samuelson, *supra* note 65, at 1199-200, 1224-25; Yanisky-Ravid, *supra* note 28, at 700-01; Yanisky-Ravid & Liu, *supra* note 4, at 2239.

[122] *See also* Davies, *supra* note 21, at 616-17 ("Incentive drives the system."); Denicola, *supra* note 9, at 273; Hristov, *supra* note 68, at 439; Andrew J. Wu, *From Video Games to Artificial Intelligence: Assigning Copyright Ownership to Works Generated by Increasingly Sophisticated Computer Programs*, 25 AIPLA Q.J. 131, 156 (1997).

[123] *See, e.g.*, Boyden, *supra* note 21, at 391; Palace, *supra* note 65, at 236-37; Ramalho, *supra* note 20, at 20; Samuelson, *supra* note 65, at 1225; Yanisky-Ravid, *supra* note 28, at 702; Yu, *supra* note 21, at 1263-64. *But see* Abbott, *supra* note 65, at 1103-04; Butler, *supra* note 9, at 735; Erica Fraser, *Computers as Inventors—Legal and Policy Implications of Artificial Intelligence on Patent Law*, 13 SCRIPTED 305, 326-27 (2016) (on patent law); Hristov, *supra* note 68, at 439.

[124] Davies, *supra* note 21, at 610; Dorotheou, *supra* note 53, at 89; Gervais, *supra* note 14, at 17-22; Palace, *supra* note 65, at 236-37; Ramalho, *supra* note 20, at 20; Samuelson, *supra* note 65, at 1207-08; Yu, *supra* note 21, at 1261.

where creativity will thrive without the prospect of a copyright monopoly—or at least with less-than-maximum protection.[125] Nevertheless, it is hard to deny that innovative activity is, at least in principle, based on and driven by pecuniary incentives. Especially for the AI industry as part of the digital economy, the incentive model is indeed a suitable starting point. A sharing culture may exist, and many spillover benefits may go unrewarded, but Silicon Valley (and similar environments) are still primarily driven by money.[126] Consequently, it is also true that there will seldom be enough investment in innovation without the prospects of sufficient income. Here as well, therefore, the principal assumption is warranted that the assignment of rights must allow their owners—over the period of these rights' validity—to recover their advance investment. Only if the sum of *all* benefits from exploiting those rights equals the sum of the invested funds will market failure be prevented. Put another way, the expected monopoly rent must reach at least the amount of the investments.

This last aspect is crucial for the economic model of emergent work protection. With respect to AI creativity, the overall calculation should include both rights *in* AI and rights in products created *by* AI (hence, emergent works). Both—the AI apparatus and the emergent works as the autonomously produced output—constitute the "product" that ultimately accounts for full amortization of the advance investment in AI innovation. Together, the benefits of exploiting the AI application *and* its emergent works constitute the AI innovators' monopoly rent.[127] Since all revenues together must

---

[125] For an overview of the debate, see, for example, Brett M. Frischmann & Mark A. Lemley, *Spillovers*, 107 COLUM. L. REV. 257 (2007); Mark A. Lemley, *IP in a World Without Scarcity*, 90 N.Y.U. L. REV. 460, 462-465 (2015) [hereinafter *IP in a World Without Scarcity*]; Mark A. Lemley, *Property, Intellectual Property, and Free Riding*, 83 TEX. L. REV. 1031 (2005). For a comparative perspective, see, for example, Dornis, *supra* note 12, at 160-68.

[126] For spillover theory in particular, see Frischmann & Lemley, *supra* note 125. For the necessity of financial incentives in the digital economy, see, for example, Massimo Maggiore, *Artificial Intelligence, Computer Generated Works and Copyright*, *in* NON-CONVENTIONAL COPYRIGHT 382, 396 (Enrico Bonadio & Nicola Lucchi eds., 2018).

[127] In this regard, the issue of emergent works protection is different from the scenario of, for instance, Apple claiming a right in an iPhone user's work that was created using the iPhone. In the former case, the AI's autonomy connects creation of the AI as such with production of emergent works. In the latter case, the iPhone user's individual creativity makes the outcome a different product (which is no longer connected to Apple as the producer of a mere instrument for other actors'

be considered as providing the necessary incentive for an optimum level of dynamic efficiency, it is evident that non-protection of emergent works lowers the overall level of investment in technical innovation and, ultimately, the actual production of creative AI.

Of course, one may raise the question whether emergent works necessarily have to receive maximum authorial copyright protection. As just mentioned, innovative and creative industries and sectors do exist where the investment reappropriation mechanism functions well without IP protection.[128] This is due mainly to non-pecuniary incentives. One example is the intrinsic motivation of programmers and software experts, who—in addition to the value of making a living—may be strongly motivated by prospects of gaining reputation and peer recognition.[129] Moreover, if it is true that innovation in IT industries is an issue of small steps and incremental improvements that are often quickly outdated, and if innovators' first-mover advantage already provides sufficient opportunities to amortize investments, this may be another reason to doubt the utility of maximum protection for AI innovators.[130]

More generally, a look at the internet economy and its effects on IP protection may even bring up deeper concerns. In this regard, artificial creativity may be just a facet of the larger trend in which new technology makes IP protection less relevant. Unlike what we might have expected, society seems to have become more innovative and creative with the internet-driven rise of a free-sharing (or rather, easier-to-copy and unsanctioned-taking) culture.[131] In an ecosystem where rights-ownership seems to be constantly losing importance, IP protection and, accordingly, emergent-works protection may be questionable. However, at least two aspects make artificial creativity stand out from the general trend. First, even proponents of a world with less extensive IP rights acknowledge that certain innovative and creative industries will

creative endeavors). I am indebted to Mark Lemley for this distinction (not concealing, however, that he does not agree). For an explanation of AI autonomy, see *supra* text accompanying notes 15 through 21.

[128] *See supra* text accompanying note 126.

[129] *See* Dornis, *supra* note 12, at 166-68.

[130] *See, e.g.*, Palace, *supra* note 65, at 239; Samuelson, *supra* note 65, at 1225; *see also* Yu, *supra* note 21, at 1264-65.

[131] For this phenomenon, see *IP in a World Without Scarcity*, *supra* note 125, at 482-96.

always have to rely on rigid IP protection.[132] This namely concerns sectors in which high upfront investment is essential, such as the pharmaceutical industry and big-budget movie and video-game companies.[133] The same is true with respect to the AI industry. Here as well, we would do well not to rely on amateur or household innovation and creativity. In other words, the more sophisticated the product (in our case, autonomous AI), the less we can expect the "marketplace" or the "crowd" to innovate naturally and spontaneously—i.e., without the incentive provided by IP monopolies.

The second aspect may appear paradoxical at first, but it distinguishes the case of artificial creativity from examples of anti-progressive IP protection. Obviously, IP rights and enforcement were often instrumental in stifling the implementation of new technologies in earlier technological revolutions. This namely was the case when IP rights were used to fight accelerated and ubiquitous dissemination over the internet.[134] Protection was often reduced to and abused as an instrument to hinder technological progress. But the same is not true for protection of emergent works. The innovation of AI will not be slowed down if we protect emergent works. In fact, the contrary is true: by protecting artificial output in downstream markets, the actors involved in AI innovation receive an additional boon with no strings attached, since it comes without direct limitations or restrictions on their AI-related research and development. This is different from cases in which protection for innovation as such (e.g., through patent law) is ratcheted up. Such an extension will at the same time benefit and injure innovators—first by providing more revenue, and second by making innovation more expensive.

Therefore, all uncertainties and debate notwithstanding, the dominant approach in current scholarship—refusing protection for emergent works—cannot be the last word. An adequately context-sensitive and policy-oriented legal regime should instead consider all circumstances—namely all potential advantages and

---

[132] *Id.* at 496.
[133] *Id*.
[134] See, for example, the description of copyright owners' fight against the development of the digital content economy in Mark A. Lemley, *Is the Sky Falling on the Content Industries?*, 9 J. ON TELECOMM. & HIGH TECH. L. 125 (2011). *See also IP in a World Without Scarcity*, *supra* note 125, at 482-85, 497-99.

disadvantages of emergent works protection. In any event, focusing on a few aspects only, or excluding relevant aspects a priori and without empirical analysis, does not provide a solid basis for law- and decision-making.[135] No doubt, as with other innovative and creative industries, a closer look may reveal aspects that counsel against the protection of downstream production. Yet without reliable data explaining these concerns as well-founded, the better arguments are those calling for the protection of emergent works.

2. Wrong Incentive: It Was Me—Not the Robot!

In addition to the formal economic model and its incentive mechanism, there is another economic, not to say behavioral, aspect that requires consideration. It concerns the handling of emergent works in litigation and with respect to rights enforcement. The dominant approach in academia suggests that emergent works should enter the public domain.[136] But this can prove especially problematic from a practical perspective. If protection is denied, owners and users of autonomous AI applications will attempt to conceal the creative autonomy of the production process and the fact that AI was the truly creative agent. They will instead portray themselves (as humans) as authors or creators of the emergent works at issue.[137] It will be hard, if not impossible, to solve this problem in practice since the relevant facts are virtually always private. Quite paradoxically, this practical disincentive may ultimately result in the acquisition of full copyright protection for emergent works—particularly if the AI owner or user succeeds in establishing herself as the author or creator.

Additionally, one more practical aspect must be considered: the incentive to conceal the fact of AI creativity will likely lead to a loss of public information. If the human owners of AI keep the use of their applications secret, the state of the art in AI innovation will become a trade secret, and public information on the issue will be

[135] On the role of empirical studies, see Abbott, *supra* note 65, at 1106; Jane C. Ginsburg, *People Not Machines: Authorship and What It Means in the Berne Convention*, 49 IIC 131, 134 (2018).
[136] *See supra* Section I.B.
[137] Hristov, *supra* note 68, at 450; Palace, *supra* note 65, at 237; Samuelson, *supra* note 65, at 1207, 1226; Yu, *supra* note 21, at 1266.

reduced. This will result in a slowing down of the AI innovation cycle.[138]

C. Lest We Forget: Labor Markets, Global Competition, and the Public Infosphere

Finally, the rapid increase of AI capacities and the proliferation of emergent works that may ensue raise questions that reach beyond the microeconomic model. Apart from the disruption of labor markets and issues of international competition, the sociocultural effects of artificial creativity must be analyzed.

Simply put, a macroeconomic perspective suggests two problems with AI creativity that may soon become effective. The first concerns the imminent threat of job losses.[139] A very early and dark fiction of this scenario can be found in a 1954 short story by Roald Dahl.[140] In "The Great Automatic Grammatizator," he outlines the implications of the invention of a machine that is capable of writing short stories and novels at the push of a button. The narrative ends grimly: free and ceaseless mechanical production leads to a displacement of human writers and the dominance of the "Great Automatic Grammatizator." In reality, the effect of the emergence of AI creativity is by no means clear. Although new technologies did have disruptive effects in the past, industrial revolutions often resulted in more rather than less employment. Regardless, changes ensuing from technological revolutions were often truly creative destruction in the Schumpeterian sense: in addition to losses in some sectors, new jobs were created in other areas. The past has also taught us that both alarmism and optimistic exaggerations were always on the agenda.[141] For digitization and AI creativity,

---

[138] Hristov, *supra* note 68, at 450; Palace, *supra* note 65, at 236; *cf. also* Abbott, *supra* note 65, at 1104-05 (on patents).

[139] *See generally* Carl Benedikt Frey & Michael A. Osborne, *The Future of Employment: How Susceptible Are Jobs to Computerisation?*, 114 TECH. FORECAST. SOC. CHANGE 254, 265-67 (2017).

[140] Roald Dahl, *The Great Automatic Grammatizator*, *in* SOMEONE LIKE YOU 190 (Penguin Books 1970) (1954).

[141] *Cf., e.g.*, John Maynard Keynes, *Economic Possibilities for Our Grandchildren*, *reprinted in* ESSAYS IN PERSUASION 358, 369 (Harcourt Brace 1932) (1930) (explaining that, in the near future, the need for steady work would be eliminated, "For three hours a day is quite enough to satisfy the old Adam in most of us!"). For an overview of the debate, see *IP in a World Without Scarcity*, *supra* note 125, at 512-13.

therefore, very likely the same holds true: structural changes in labor markets must be moderated by lawmakers, but they cannot be stopped.[142] On the whole, a decline in employment seems less likely than the creation of more jobs—particularly for humans.

The second macroeconomic concern with structural disruption as a consequence of AI productivity is an imminent imbalance in competition in digital marketplaces. The allocation of rights to owners of AI might create a disparity in the distribution of wealth within society.[143] This aspect also has a global dimension, for AI production is overwhelmingly in the hands of a few players, mostly based in the United States and Japan.[144] As has been warned, such a development could produce a kind of re-feudalization across the globe. The long-term winners of the algorithmic economy would be a small handful of companies.[145] Not surprisingly, the United States is pursuing a strategy to foster the development and implementation of AI, as reflected, for example, in the Future of Artificial Intelligence Act of 2017.[146] In addition, "maintaining American leadership in artificial intelligence" is the topic of a recent executive order that, inter alia, aims to optimize the legal framework and ecosphere for AI innovation as an essential aspect of future social welfare, international competitiveness, and national security.[147] In Europe, a similar mindset has taken hold, although it is more about not getting lost than about defending the lead. The European Commission has recently begun to voice fears of increased

---

[142] *See, e.g.*, *Artificial Intelligence for Europe*, *supra* note 15, at 13-14.

[143] For a dramatic picture of what might happen *see, e.g.*, NICK BOSTROM, SUPERINTELLIGENCE: PATHS, DANGERS, STRATEGIES 194-225 (2014).

[144] WIPO, *Artificial Intelligence*, WIPO TECH. TRENDS 2019, at 58 (2019); *see also* Palace, *supra* note 65, at 237-38.

[145] *See, e.g.*, Richard B. Freeman, *Who Owns the Robots Rules the World*, 5 IZA WORLD OF LABOR 1, 5-6 (2015); Peter Stone et al., *Artificial Intelligence and Life in 2030: One Hundred Year Study on Artificial Intelligence*, STAN. U. 43-49 (2016), https://ai100.sites.stanford.edu/sites/g/files/sbiybj9861/f/ai100report10032016fnl_singles.pdf [https://perma.cc/XJZ7-AZX7]; Stephen Hewitt, *Protection of Works Created by the Use of Computers*, 133 NEW L.J. 235, 237 (1983); WIPO, *supra* note 144, at 58.

[146] FUTURE of Artificial Intelligence Act of 2017, H.R. 4625, 115th Cong. (2017).

[147] Maintaining American Leadership in Artificial Intelligence, Exec. Order No. 13,859, 84 Fed. Reg. 3,967 (Feb. 11, 2019).

competition, combined with an almost desperate call for significantly increased efforts in AI innovation.[148]

Finally, the most disconcerting potential effect of increased AI creativity is non-economic. This aspect concerns the potential effects of AI proliferation on human culture and on the infosphere, as well as on politics and democracy. To date, these issues have barely been discussed.[149]

One need not expect an explosive growth of AI capacities to predict that, in the future, a significant portion of hitherto human creative output will be produced by AI. Hence, unlike previous technological upheavals, the issue is no longer the *reproduction* of human-made works but rather the *substitution* of human-made content. This development has upsides, because, as we have seen,[150] it not only increases the consumption of creative products and makes them cheaper, but also frees up human resources for use in higher-quality employment, more social and empathetic commitments, and the enjoyment of leisure time.[151] Yet worrying implications exist, especially with regard to human culture and public discourse.

The landscape of creative output will increasingly consist of content that has been created by "AI on the shoulders of AI." In other words, artificial creativity will determine an ever larger area of art, culture, and public communication and information. The consequences of such an artificial and autopoietic infosphere are hard to foresee. One example of effects that have yet to be addressed is the long-term implications for human creative abilities.[152] In addition, we do not know whether or how the configurators of AI algorithms might

---

[148] *See, e.g.*, *Artificial Intelligence for Europe*, *supra* note 15, at 5 ("One of the main challenges for the EU to be competitive is to ensure the take-up of AI technology across its economy. European industry cannot miss the train.").

[149] For a critical analysis of the potential deterioration of information quality in AI productions (loosely based on information theory), see, for example, Gervais, *supra* note 14, at 2-12.

[150] *See supra* Section II.B.1.

[151] *See, e.g.*, Abbott, *supra* note 65, at 1118-19 ("Creative computers may simply refocus, rather than inhibit, human creativity.").

[152] On so-called digital dementia (as a consequence of our increased use of and reliance on computers and digital devices), see MANFRED SPITZER, DIGITALE DEMENZ (2012).

affect public discourse—including risks of bias, distortion, and manipulation.[153]

Such an impending downward spiral of culture and information quality implies more than a loss of the social functions of creativity. When creativity is emancipated and ultimately disconnected from the human mind and thereby set free to find its own way, there is an imminent danger of misdirection and even instrumentalization. This goes beyond the dissolution of the "aura" of art explained at length by Walter Benjamin in the 1930s.[154] It also brings the threat of distortion and imbalance in public information and discourse. In short, AI will come to provide increasing content for public information and, ultimately, political discourse. We do not need much imagination to see that Theodor Adorno's and Max Horkheimer's warnings of an ever more commercialized "culture industry," a "reproduction of the ever-same," and a threat of a "manipulation of the masses" are of utmost relevance in today's environment.[155] The artificialization of our culture may ultimately be disruptive in a multitude of ways.

In sum, for cogent policy- and lawmaking on artificial creativity, a number of aspects must be taken into account. First, under a microeconomic perspective, the current refusal of protection for emergent works sets the wrong incentives. If AI creativity is considered to be useful, not only AI as such but also its output must be protected. At the same time, macroeconomic, sociocultural, and political effects must be considered. Some of these scenarios may be disconcerting. Yet none are particularly urgent. In addition, it must be noted that copyright regulation cannot stop technological revolutions and socioeconomic upheavals. Copyright is not intended or designed to regulate macroeconomic developments, much less social and political disruptions. As in all fields of IP protection, copyright can at best contribute to moderating socioeconomic developments. It is therefore clear that, for the time being, lawmakers must focus on the evolution of AI industries. At least

---

[153] In this regard, we may actually face a new and different kind of "filter bubble." On the internet filter bubble, see ELI PARISER, THE FILTER BUBBLE: WHAT THE INTERNET IS HIDING FROM YOU 189 (2011).

[154] Walter Benjamin, *L'œuvre d'art à l'époque de sa reproduction mécanisée*, 5 ZEITSCHRIFT F. SOZIALFORSCHUNG 40, 45 (1936).

[155] Max Horkheimer & Theodor W. Adorno, *Dialektik der Aufklärung – Philosophische Fragmente*, *in* GESAMMELTE SCHRIFTEN V 144 (Schmid Noerr ed., 1987).

with regard to artificial creativity, legal uncertainty and legislative idleness must not stifle further innovation .

III. RECONCEPTUALIZATION: A ROADMAP

As my analysis has shown, emergent works should not be excluded from protection. An economic perspective suggests that a flexible system of rights protection is required. In addition, pending a black-letter solution, one must consider the protection of emergent works under unfair competition doctrine, namely as subject matter that qualifies for misappropriation prevention. A reconceptualization must focus on the most essential issues, starting with the question of what kind of right should be assigned to artificially creative products, whether this right should be transferable, and whether a requirement for minimum creativity should apply. Additionally, for want of an electronic person, a human right-owner must be determined, and it must be clear how long protection for an emergent work should last.

A. Starting Point: Rights Characterization and Transferability

Under current doctrine, emergent works receive no authorial copyright due to their lack of a human author or creator.[156] But this must not be the end of the story. In Europe, as we have seen, related or neighboring rights protection provides for a system of protection that is not dependent on author personality. Whether they are called *droits voisins* as in France, *Leistungsschutzrechte* as in Germany, *diritti connessi* as in Italy, or *naburige rechten* as in the Netherlands and Belgium, this rights regime covers a wide range of subject matter that need not overcome the threshold of a "personal intellectual creation," namely phonograms and sound recordings, first fixations of films and broadcasts, and certain databases.[157]

In general, the requirements for right acquisition in these categories are lower, with a correspondingly reduced scope of protection. Even though neighboring rights acquisition may not always be devoid of

[156] *See supra* Section I.B.1.
[157] *See supra* text accompanying notes 23, 24, 81, and 82.

authorial and creative input (think of performance rights), there is no requirement of a specifically *human* authorship.[158] Therefore, as we have seen, introducing a new category of lower-level protection for AI-generated works to the existing system of genuine copyrights and neighboring rights (for human-made works) would not collide with the foundations of European and civil-law copyright, particularly the paradigm of personality rights protection.[159] Accordingly, if protection for emergent works is at stake, one should consider establishing an additional category of neighboring rights to protect against exploitation. Unlike the preexisting categories, a new class of emergent-works neighboring rights would cover all manifestations of artificial creativity, especially where the level of actual creativity is high, such as AI art and music. The essential aspect for protection would be the existence of an autonomous *artificial* creation.

In fact, protection under a regime of neighboring rights would provide for an economically reasonable and dogmatically consistent answer to the question of transferability. Under the economic model of property protection, the free and unhindered transferability of rights is essential. Only if transfer is possible can productive resources—in the interest of their optimal allocation—move to their highest utility.[160] This also applies to emergent works. Here as well, the unhindered transfer of rights makes it possible for AI innovators to attain the financial resources they need for further innovative activity. At the same time, transfer makes it possible for investors, who may not be innovative themselves, to utilize their financial resources for exploitation of the acquired innovations.[161] Under a doctrinal perspective, the transferability of neighboring rights in emergent works fits into the existing framework. Unlike personality-founded authorial copyrights, these entitlements are at least in part freely transferable.[162]

---

[158] GOLDSTEIN & HUGENHOLTZ, *supra* note 23, § 6.2.
[159] *See supra* Sections I.B and II.A.
[160] *See, e.g.*, RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW § 3.1 (9th ed. 2014).
[161] For the need to freely transfer immaterial goods and rights, see JONATHAN HASKEL & STIAN WESTLAKE, CAPITALISM WITHOUT CAPITAL: THE RISE OF THE INTANGIBLE ECONOMY 68 (2018).
[162] *See, e.g.*, Council Directive 96/9, art. 7(3), 1996 O.J. (L 77) 20, 26 (EC). For a (short) comparative overview, see, for example, JANE C. GINSBURG & EDOUARD TREPPOZ, INTERNATIONAL COPYRIGHT LAW: U.S. AND E.U. PERSPECTIVES 545-49 (2015).

B. Turing Reloaded: Minimum Creativity

In addition to determining whether protection is granted at all, what qualities a right in emergent works should have, and whether such a right should be transferable, we must also decide whether a minimum of creativity should be required. As with copyrights, such a minimum standard is essential for avoiding overprotection.

Evidently, a purely mechanical and assistive use of AI does not produce emergent works (for want of AI autonomy). No protection issue arises, since it is the human actor who contributes the creative spark.[163] In addition, wholly "uncreative" products must not be protected, be they autonomously produced by AI or not. A scenario of this kind exists, for instance, when a work of art or other creative content is literally copied. Even if the AI acted autonomously while copying, the outcome does not warrant protection, just as human copying would fail to qualify for protection due to the lack of *independent* creation.[164]

In the same vein, protection must be denied if a product has been fabricated within the narrow confines of a preexisting framework or other structure that curbs creative input, namely in cases where the actor—natural or artificial—is limited to following the simple rules of an alphabetical collection of information (e.g., when compiling lists or directories) or other similarly mechanical activities.[165] Such a requirement of minimum creativity for emergent works will have to be based on a variant of the Turing test, strictly looking at the outcome (not the process) of the "creation" at issue.[166] In U.S. copyright law, this minimum standard of originality and individuality is embodied in the Supreme Court's catchy *Feist* formula of a "modicum of creativity."[167] As the court explained, "even a slight amount [of creativity] will suffice. The vast majority

---

[163] *See supra* Part I.

[164] *See, e.g.*, Feist Publications, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 346 (1991).

[165] *But cf. also* Maggiore, *supra* note 126, at 397-98 (suggesting "stripping away the standards of originality and creativity and instead embracing an industriousness oriented approach (that would reward skill, labour and effort or somehow focus on the creation of incremental knowledge).").

[166] For the so-called Turing test, see *supra* Section I.A.

[167] *Feist*, 499 U.S. at 346 ("[O]riginality requires independent creation plus a modicum of creativity."). On the requirement of minimum AI creativity, see Lee, *supra* note 56, at 953; Samuelson, *supra* note 65, at 1199.

of works make the grade quite easily, as they possess some creative spark, 'no matter how crude, humble or obvious' it might be."[168] Protection is excluded, however—and this is essential as a bottom line for both human and artificial creations—if the outcome is a "garden-variety product" and the result of "an age-old practice, firmly rooted in tradition and so commonplace that it has come to be expected as a matter of course."[169]

European law has a rather similar and equivalent demarcation line excluding products of minimum originality and creativity from protection. As the European Court of Justice has made clear (and, accordingly, has rejected protection for scenes of soccer matches), no protection is possible to the extent that a product is fabricated or constructed in a mechanical fashion, without sufficient breathing space for individual creativity. As the court explained, "football matches … are subject to rules of the game, leaving no room for creative freedom for the purposes of copyright."[170] Furthermore, under European Court of Justice case law and in member states' doctrines, works that are the result of a purely mechanical and technical craft (e.g., industrial products), together with the mere listing and compiling of information, cannot enjoy copyright protection.[171]

C. Another Economic Lesson (So Far Untaught): Personal Allocation of Rights

Determining which rights should be granted is necessarily accompanied by the issue of ownership. The AI as such is not an eligible right-holder because an "electronic person"—i.e., the AI as a legal entity with rights and obligations of its own—has not (yet)

---

[168] *Feist*, 499 U.S. at 345 (citations omitted).
[169] *Id*. at 363.
[170] Case C-403/08, Football Association Premier League Ltd. and Others v. QC Leisure and Others (C-403/08) and Case C-429/08, Karen Murphy v. Media Protection Services Ltd., ECLI:EU:C:2011:43 (2011); *see also* Case C-5/08, Infopaq International, ECLI:EU:C:2009:89, at paras. 37-48 (2009).
[171] *See, e.g.*, Case C-145/10, Eva-Maria Painer v. Standard VerlagsGmbH & Others, ECLI:EU:C:2011:798, at paras. 88-94 (2011) (concerning portrait photographs (considered sufficiently creative to warrant protection)). For German doctrine, *see, e.g.*, Bundesgerichtshof [BGH] [Federal Court of Justice] May 9, 1985, 94 ENTSCHEIDUNGEN DES BUNDESGERICHTSHOFS IN ZIVILSACHEN [BGHZ] 276 (287) – Inkasso-Programm (Ger.) (for software and computer programs); Schulze, *supra* note 73, § 2 para. 22.

been recognized.[172] Accordingly, only human actors may hold rights in emergent works. As far as scholarly analyses have considered protection to be warranted, they have usually suggested the AI's programmer, user, or investor as the right-holder.[173] No dominant opinion has evolved, and none of the suggestions brought forward can be rejected as doctrinally inconsistent or impractical.[174] Yet two aspects that are most determinative for right allocation have been widely neglected to date.

The first aspect concerns the fact that the assignment of rights calls for the author-in-law, not the author-in-fact, and disregards actual human input. As we have seen, the outcome of truly *autonomous* AI creativity occurs independently. Human input is limited to the initial conception of AI hard- and software and the activation of the on/off switch—but nothing more. Accordingly, the production of emergent works is detached from and occurs many steps after the last instance of human input—after the AI has attained autonomy and independence from the confines of its initial programming.[175] Since there is no human creativity involved, the allocation of rights in emergent works requires a legal fiction—it is the author-in-law, not the author-in-fact, that must be determined.

The second aspect concerns the application of the right-allocation fiction in light of the realities of AI creativity. It requires taking another look at both the economic model and the practice of emergent work exploitation. Closer scrutiny reveals that it is the power of disposition—i.e., the respective human actor's legal and actual authority to determine AI utilization (as hardware owner and

---

[172] *See, e.g.*, SAMIR CHOPRA & LAURENCE F. WHITE, A LEGAL THEORY FOR AUTONOMOUS ARTIFICIAL AGENTS 1, 153 (2011); Jack B. Balkin, *The Path of Robotics Law*, 6 CALIF. L. REV. 45, 46 (2015); Butler, *supra* note 9, at 739, 742; Samuelson, *supra* note 65, at 1199-200; Yu, *supra* note 21, at 1257-58. *But see also* Abbott, *supra* note 65, at 1121; Davies, *supra* note 21, at 617-19; Fraser, *supra* note 123, at 330; Jared Vasconcellos Grubow, *O.K. Computer: The Devolution of Human Creativity and Granting Musical Copyrights to Artificially Intelligent Joint Authors*, 40 CARDOZO L. REV. 387, 419 (2018).

[173] *See, e.g.*, Butler, *supra* note 9, at 742; Davies, *supra* note 21, at 616; Hewitt, *supra* note 145, at 236; Hristov, *supra* note 68, at 444; Samuelson, *supra* note 65, at 1205; Yu, *supra* note 21, at 1258.

[174] *But cf.* Samuelson, *supra* note 65, at 1190 n.15 ("[Butler's] absurd solution should be taken as a sign of how frustrated a person can become when trying to answer this authorship question satisfactorily within the traditional bounds of copyright. That is, Butler's absurd solution is a sign of how difficult this problem is.").

[175] *See supra* Introduction & Section I.A.

software licensee)—that is essential for right allocation. Accordingly, neither programming, nor data provision or actual use of an AI apparatus, nor investment in AI are relevant.

1. At First Sight: AI Programmer and Manufacturer

Because of her contribution as author and creator of the software, the programmer is regularly described as the actor most eligible to also hold rights in a computer-generated work.[176] Evidently, if the programmer has considerably contributed to the *concrete* work, she should qualify as a right-holder. This is the case whenever the initial version of an AI's software and program structure predetermine the outcome of its production. The issue is more complex and disputed, however, if the AI acts autonomously.[177] Various aspects must be considered.

First, a distinction must be made between rights *in* the AI (its software) and emergent works made *by* the AI (emergent works). There is no doubt that the programmer has rights in the AI's software, which she created.[178] However, emergent works are neither edits nor derivative works of an AI's software.[179] This would be the case only if the software or parts of it were directly and unmodifiedly (or largely unmodifiedly) implemented in an

---

[176] *See, e.g.*, Butler, *supra* note 9, at 742; Dorotheou, *supra* note 53, at 89; Hristov, *supra* note 68, at 444; Samuelson, *supra* note 65, at 1205; Yu, *supra* note 21, at 1258. Besides, under the so-called amanuensis doctrine (rejecting the potential of AI creativity in toto), the programmer will necessarily be considered the author of any computer-generated work. *See* Ginsburg & Budiardjo, *supra* note 19, at 414 ("[T]he designers of fully-generative machines, such as AARON, which create works without further intervention or input can be the authors of the resulting outputs. These designers fully formulate a creative plan, manifested in the machines' algorithms and processes, which will directly lead to the creation of expressive content. The lack of a direct connection between the designers' minds and the expressive aesthetic content of the fully-generative machine's output does not destroy the designers' authorship claims any more than the lack of a direct connection between the nature photographers' minds and the expressive aesthetic content of their works destroys those photographers' ability to claim authorship over their images.").

[177] *See, e.g.*, Davies, *supra* note 21, at 615; Samuelson, *supra* note 65, at 1205; Yu, *supra* note 21, at 1258.

[178] *See, e.g.*, Council Directive 2009/24, art. 1, 2009 O.J. (L 111) 16, 18 (EC); 17 U.S.C. § 101 (2018).

[179] Bridy, *supra* note 27, at 24-25; Butler, *supra* note 9, at 743; Davies, *supra* note 21, at 615; Ramalho, *supra* note 20, at 18; Samuelson, *supra* note 65, at 1209; Yanisky-Ravid, *supra* note 28, at 694; Yu, *supra* note 21, at 1258-59.

emergent work—or, vice versa, if the emergent work were directly based on the software.[180] Such a scenario, however, is unlikely if the AI is working autonomously and does in fact create a new and different product. By definition, therefore, an emergent work will not replicate the software or parts of it.[181]

Further, the programmer's creativity is relevant for right allocation where she has made specifications at the time of programming that concretely affect the outcome of the AI's production.[182] If this is the case, the essential part of the work's creativity is attributable to the programmer who, accordingly, is the author-in-fact. For example, a composition program that makes use of melodies predetermined by the programmer and complements these melodies with standard chords and rhythm elements would be considered to assist in the production of the programmer's creative work.[183] This is different if a composition apparatus autonomously chooses the melody, harmony, key, and rhythm. The AI programmer's initial input is then not transferred to the production level and not reflected in the emergent work's creativity.[184] In this case, the programmer is no longer an author-in-fact. Right allocation would then require legal fiction.

From an economic point of view, such a fiction would largely make sense. Assigning rights to the programmer would guarantee the

---

[180] For U.S. law, see 17 U.S.C. § 101 (2018) ("A 'derivative work' is a work based upon one or more preexisting works, such as a translation, musical arrangement, dramatization, fictionalization, motion picture version, sound recording, art reproduction, abridgment, condensation, or any other form in which a work may be recast, transformed, or adapted. A work consisting of editorial revisions, annotations, elaborations, or other modifications which, as a whole, represent an original work of authorship, is a 'derivative work'.").

[181] *Cf*. Samuelson, *supra* note 65, at 1215 ("In general, computer-generated works do not incorporate recognizable blocks of expression from the underlying program or from the data base that the program draws upon in the generative process."). A different situation may exist if the emergent work at issue is a modification of the AI's software that has evolved from autonomous learning processes and accordant AI-generated rewritings of the initial software. In this case, even though the ultimate software will be a new work in its own right (requiring personal rights allocation), the programmer of the initial software may possibly still claim rights insofar as the new version still derives from her initial product.

[182] Samuelson, *supra* note 65, 1205.

[183] *See also, e.g.*, *id.* at 1201; Wu, *supra* note 122, at 138-47.

[184] *See supra* Part I. For an example of autonomous AI in the field of musical composition, see AMPER MUSIC, https://www.ampermusic.com [https://perma.cc/4AQB-B7NC]; and Grubow, *supra* note 172, at 412-18.

necessary incentives at the level of the AI innovation.[185] It would also make no difference whether the right went directly to the programmer or to her employer or commissioner. In U.S. law, the work-made-for-hire mechanism would guarantee the allocation of rights to the employer (or commissioner) as the investing party.[186] If the programmer-employee should receive an inalienable right, as is usually the case in civil-law copyright,[187] economic realities would likely lead to a licensing of rights from the employee to the employer (or commissioner).

Practicality, however, counsels against assigning rights to the programmer or her employer. If rights to emergent works always fell to the manufacturer (programmer or employer) of the AI, any transfer or dissemination of the AI software and apparatus would lead to a divergence of ownership of the AI-generated products as such and ownership of the neighboring rights in these products. In other words, if the computer or robot is sold and its software is licensed to another actor, this purchaser will usually acquire ownership and possession of the emergent works being produced by the computer or robot. Yet since the manufacturer will become the owner of a neighboring right, the purchaser will not be allowed to exploit the emergent works. Of course, such a discrepancy may be prevented by contractual and licensing agreements. The AI manufacturer may assign all rights to the buyer.[188] However, successive sales of the AI software or apparatus would be problematic. This would also create problems with rights enforcement. The buyer may have an incentive to incorrectly report the number of emergent works.[189] Finally, any sort of an advance assignment of rights in emergent works will become complicated and fuzzy if the AI is subsequently modified or altered, further developed (or evolves itself autonomously), or combined with other AI elements by the buyer or subsequent owners.[190]

---

[185] For the economic model, see *supra* Section II.B.
[186] *See supra* Section I.B.
[187] See, for example, Germany's rule on employee programmers. German Copyright Act, *supra* note 72, § 69b(1). ("Where a computer program is created by an employee in the execution of his duties or following the instructions of his employer, the employer exclusively shall be entitled to exercise all economic rights in the computer program, unless otherwise agreed.").
[188] For the transfer of rights, see *supra* Section III.A.
[189] *See* Abbott, *supra* note 65, at 1116; Samuelson, *supra* note 65, at 1208; Wu, *supra* note 122, at 171.
[190] *See also* Davies, *supra* note 21, at 615.

Although private and autonomous regulation through licensing and the transfer of rights is generally preferred over a lawmaker's meddling (which has much potential for inefficiency), it is the divergence of rights and the complications of contracting that implies that entitlements should not accrue statically at the manufacturer and programmer level. Ownership must rather be tied to the power of disposition regarding the AI's production process. This, too, guarantees the functioning of incentive mechanisms but prevents the practical conundrum of transferring rights. Before looking more closely at this option, however, let us explore two oft-enunciated alternatives.

2. Clarification: "User" and "Investor"

Early on, scholarly literature suggested assigning rights in computer-generated works to the "user" or "operator" of the AI apparatus.[191] The United States's National Commission on New Technological Uses of Copyrighted Works appears to have chosen this interpretation when it faced the issue in 1978, explaining that "[t]he obvious answer is that the author is [the] one who employs the computer."[192] In this regard, however, the Commission may—correctly under the perspective of the time—have neglected the possibilities and potential of AI autonomy by likening the computer to a camera or typewriter, with a merely supportive function.[193] As a starting point for our analysis, we must thus note that if an AI

[191] The term "user" includes the "data operator"—i.e., the person providing the input for the AI's operation. On user rights, see, for example, Denicola, *supra* note 9, at 282-84; Hewitt, *supra* note 145, at 236; Samuelson, *supra* note 65, at 1203. For a critique, see Davies, *supra* note 21, at 616.

[192] Nat'l Comm'n on New Tech. Uses of Copyrighted Works, *Final Report on New Technological Uses of Copyrighted Works* 45 (1979).

[193] Cf. *id.* at 44 ("The development of this capacity for 'artificial intelligence' has not yet come to pass, and, indeed, it has been suggested to this Commission that such a development is too speculative to consider at this time. On the basis of its investigations and society's experience with the computer, the Commission believes that there is no reasonable basis for considering that a computer in any way contributes authorship to a work produced through its use. The computer, like a camera or a typewriter, is an inert instrument, capable of functioning only when activated either directly or indirectly by a human. When so activated it is capable of doing only what it is directed to do in the way it is directed to perform."). For the subsequent counter-position, rejecting the view that programs are "inert tools of creation," see OFFICE OF TECHNOLOGY ASSESSMENT, U.S. CONGRESS, INTELLECTUAL PROPERTY RIGHTS IN AN AGE OF ELECTRONICS AND INFORMATION 72 (1986).

apparatus is truly autonomous, no human creativity is involved and, necessarily, no human author-in-fact exists.[194] Hence, as with rights assignment to the programmer and manufacturer,[195] granting user rights would require neglecting the precondition of *human* creativity and ultimately come down to an author-in-law fiction.

Such a fiction, whenever it has been suggested, is typically justified by the argument that it is the user who, through actual utilization of the AI, determines the ultimate number of computer-generated products. Accordingly, she should be considered the actor who must be incentivized by right ownership.[196] This consideration may be correct in principle, but it is inaccurate: the decision on the amount of works to be produced is not always made by the "user" of the AI. The decision-maker, rather, is the person with the power to determine utilization of the computer or robot—the hardware owner and software licensee. In most cases, the actual "user" acts on behalf of or as an employee of the owner-licensee. "Use" is thus not decisive. What matters with respect to incentivizing the production of emergent works is the power of disposition over the AI's production activities.

Further, some scholars have suggested assigning rights in emergent works in accordance with the provisions for the protection of databases. As the Database Directive provides, protection for databases is granted if "there has been qualitatively and/or quantitatively a substantial investment in either the obtaining, verification or presentation of the contents."[197] For AI-generated works as well, it is argued that the one who has "invested" in the AI should be entitled to its products.[198] This suggestion is not incorrect insofar as the economic model is aimed at incentivizing AI innovation. Again, however, it must be noted that right ownership must not be statically and inseparably connected to the initial investment. As with programmers and manufacturers, it would be difficult to exploit AI-generated works for the same practical

---

[194] *Cf.* Davies, *supra* note 21, at 616; Wu, *supra* note 122, at 173-74; Yu, *supra* note 21, at 1259.
[195] *See supra* Section III.C.1.
[196] *See, e.g.*, Denicola, *supra* note 9, at 273; Miller, *supra* note 121, at 1045; Samuelson, *supra* note 65, at 1203-04, 1226-27; Yu, *supra* note 21, at 1261-62.
[197] Council Directive 96/9, art. 7(1), 1996 O.J. (L 77) 20, 26 (EC).
[198] *See, e.g.*, de Cock Buning, *supra* note 31, at 320-21; Hewitt, *supra* note 145, at 237. For a critical perspective, see Davies, *supra* note 21, at 616.

reasons, namely with respect to the parties' contracting and licensing.[199]

3. What Really Matters: Power of Disposition Regarding AI

As far as can be seen, no one has suggested granting rights in emergent works to the person who has the power of disposition regarding the AI as a means of production. Such a power of disposition consists of ownership and possession of the AI hardware and a license for using the AI's software.[200] Typically, a person with the power of disposition is in charge of the AI's productive activity. She can start and stop the AI's creative production process at will, and bears the costs of AI maintenance. Of course, this person may also be the programmer, manufacturer, or user.[201] But this need not be so. Indeed, right ownership of actors with the power of disposition is not self-evident. After all, these persons may not always have a direct influence on the creative output. The most common example of a person with the power of disposition is the owner of an AI robot who is employing the robot's actual user. In this case, the person with a power of disposition has nothing to do with the programming and may not even operate the AI's on/off switch. Nevertheless, for a number of reasons, the power of disposition regarding the computer or robot—in the sense of accounting for the AI's use and non-use and for its maintenance—is key.

To start, assignment of rights to the person with the power of disposition is most appropriate practically. This power usually goes hand in hand with possession and ownership of the emergent works (e.g., an AI-generated painting). If allocation follows the power of disposition, legal ownership and utilization options, as well as marketing efforts, are concentrated in one hand. This minimizes

---

[199] See *supra* Section III.C.1.

[200] For a theory that suggests a flexible granting of rights to the "fictional human author" (which can, inter alia, also be the "computer owner"), see, for example, Butler, *supra* note 9, at 744; Wu, *supra* note 122, at 159-62; *see also* Abbott, *supra* note 65, at 1113.

[201] Arguably, under a conception that sees neighboring rights for emergent-work protection as an entitlement independent of personality rights, corporate right ownership is possible. I am indebted to the *Yale Journal of Law & Technology* editors for pointing this out. For the personality right limitations in general, see *supra* Section II.A.

transaction costs and avoids disincentives and enforcement problems, particularly the costs of elaborate contractual design.[202] It is thus also no surprise that such an allocation of rights accommodates actors' natural understanding of ownership relations. Persons with the power of disposition—typically, the owner and possessor of the AI apparatus—will justifiably assume that their acquisition of the computer or robot (as a means of production) comes with a right to use its output.[203]

Such an assignment guarantees an efficient allocation of rights in the Coasean sense.[204] This may not be clear at first sight, but emerges upon a closer look at the market mechanism. As we have seen, the incentive model calls for impulses at the level of AI innovation, by programmers, manufacturers, and investors.[205] Accordingly, the proceeds from emergent work exploitation must be guaranteed to make their way into the innovators' pockets. Unlike what might be expected, however, rights must not accrue at the innovators' level. The market mechanism will establish optimal income-based incentives even without a direct assignment of rights to the innovators. This is due to the fact that when an AI apparatus is sold, its value and price will reflect all expected benefits from utilization. These benefits comprise both the income from immediate use of emergent works (e.g., sale) and proceeds from their further exploitation (e.g., copying of emergent works and the copies' distribution). In short, the AI is always as valuable as the income that can be generated *in toto*. Accordingly, if rights come with the power of disposition, the value of the AI apparatus and its market price will increase. This increase effectuates higher prices in upstream markets and ultimately guarantees a compensation chain reaching back to the initial level of AI innovation.[206]

Ultimately, this solution may resemble the structure of rights allocation with regard to the protection of so-called previously unpublished works. As the Copyright Term Directive provides, "Any person who, after the expiry of copyright protection, for the first time lawfully publishes or lawfully communicates to the public

---

[202] See *supra* Section III.C.1.
[203] *See also* Samuelson, *supra* note 65, at 1207-08.
[204] For rights allocation under the Coase theorem, see R.H. Coase, *The Problem of Social Cost*, 3 J. LAW & ECON. 1, 8 (1960).
[205] *See supra* Section II.B.1.
[206] For a similar argument, see also Samuelson, *supra* note 65, at 1203 (albeit arguing in favor of right allocation to the "user"); Abbott, *supra* note 65, at 1116.

a previously unpublished work, shall benefit from a protection equivalent to the economic rights of the author."[207] This provision establishes a direct correlation between the publication and the exploitation of a work. It is the fact that a henceforth non-public work is made available for public use that justifies the granting of rights (and benefits) to the actor—even though she was not creative in the first place, having contributed only the effort of bringing a work to the marketplace.[208] Combining the making available with the acquisition of rights establishes a de facto link between the power of disposition over the unpublished work and right ownership. Strictly speaking, scenarios of artificial creativity differ, since it is not only the making available and the publication of emergent works that must be incentivized but also the innovation of the creative AI as such.[209] Yet the incentive mechanism works similarly in both scenarios. In artificially creative production, it is the power of disposition over the *AI apparatus* that determines the allocation of rights. As seen, this power implies ownership and possession of the *AI-generated products*.[210] As in the case of previously unpublished works, the owner and possessor of an emergent work not only needs incentives to run and maintain the AI apparatus but must also be incentivized to take care of and ultimately publish and make available the AI's products.

Necessarily, such an allocation of rights, once it has occurred, must be independent of the continued existence of the owner's power of disposition. If, for example, an AI rental and licensing relationship comes to an end, this should not affect the lessee's rights in emergent works produced when the contract was effective.

D. Term of Protection

The determination of the exact term of protection for emergent works may be the most intricate task. It requires balancing the advantages and disadvantages of protection (seen as a monopoly grant). On the advantage side, the primary aspect to be considered

---

[207] Council Directive 2006/116, art. 4, 2006 O.J. (L 372) 12, 14 (EC).
[208] *Cf.* Samuelson, *supra* note 65, at 1203-04; Ramalho, *supra* note 20, at 22 (making similar arguments).
[209] For the incentive mechanism, see *supra* Section II.B.1.
[210] *See supra* Section III.C.3. I am indebted to the *Yale Journal of Law & Technology* editors for this clarification.

is the need to establish sufficient incentives for AI innovation in order to guarantee dynamic efficiency. On the disadvantage side, the key consideration is the expected costs and losses in terms of static efficiency (in the sense of the classic access problem), as well as risks for the labor market, competition, and impoverishment of human creative processes and contents.[211] Evidently, the time-of-protection question can hardly be answered off the cuff.

At first glance, it may appear reasonable to adapt to the protection periods for existing categories of related or neighboring rights, such as the twenty-five-year period for previously unpublished works[212] or the thirty-year period for critical and scientific publications of public domain works.[213] Another example is the UK CDPA's protection for computer-generated works with a fifty-year protection period.[214] Yet such an inference would be too hasty. Indeed, a simple analogy to some or all of these rules must be avoided. This is due to the fact that the incentive mechanism and structure for autonomous AI creativity are so different from existing categories of neighboring rights that the determination of the interests involved and the cost-benefit analysis must be carried out independently.[215] Moreover, the general critique of overlong protection periods in copyright law counsels implementing a period significantly shorter than twenty-five years.[216] In this regard, the most eligible parallel (if at all) might be the fifteen-year protection period for databases.[217]

In addition, it may be reasonable to consider distinguishing between different categories of emergent works with respect to their economic value (especially their half-value periods). Depending on the accumulated value of each category, different terms of protection could be reasonable. For example, protection for an AI-generated popular song may last longer than for an emergent sound recording or photograph. Inevitably, however, the economic

---

[211] See *supra* Section II.B. and C.
[212] Council Directive 2006/116, art. 4, 2006 O.J. (L 372) 12, 14 (EC).
[213] *Id*. art. 5.
[214] See *supra* Section I.B.1.
[215] *But cf., e.g.*, Davies, *supra* note 21, at 619 (suggesting "the same termination principles" as with human authors).
[216] For a general critique of overlong protection periods in copyright law, see William M. Landes & Richard A. Posner, *An Economic Analysis of Copyright Law*, 18 J. LEG. STUD. 325, 361 (1989).
[217] Council Directive 96/9, art. 10(1), 1996 O.J. (L 77) 20, 26 (EC).

benefits of such a fine-tuning would still have to be balanced against the disadvantages of an overly elaborate system of rights protection, especially with respect to the increase in enforcement costs.[218]

E. Merger of Human and Artificial Creativity

One last aspect to be analyzed is the question of how to allocate and demarcate rights in cases where the production of a creative work involves both human and artificial creativity. At least two scenarios require closer analysis.

To start, even if emergent works are credited with a neighboring right, a problem of potentially wrong incentive remains: human actors involved in the production process (namely the AI owner or lessee) will still have an incentive to extend the scope and duration of protection by incorrectly asserting a "human creation." This incentive may be smaller than in cases where protection for emergent works is denied,[219] but it still exists. After all, full-fledged protection by an authorial copyright is more valuable than a neighboring right. Scholarly voices have suggested introducing a labeling requirement for emergent works (e.g., "made by AI") as a precondition for protection.[220] Such labelling, however, may be difficult to implement in practice, notably in cases of unembodied works such as AI-generated music. Less burdensome and more practical—but still effective—would be a disclosure obligation at the time of rights assertion.[221] Under such a rule, the right owner would have to unveil the artificiality of a work at the beginning of litigation at the latest. She would then be allowed to rely on a presumption of right ownership. Otherwise, any kind of false or incomplete information or any attempt to deceive would be sanctioned with a forfeiture of all rights under a doctrine of unclean hands.

---

[218] *See, e.g.*, Tim W. Dornis, *Non-conventional Copyright: An Economic Perspective*, *in* NON-CONVENTIONAL COPYRIGHT 455, 467-75 (Enrico Bonadio & Nicola Lucchi eds., 2018) (on the uniformity trap of monolithic copyright protection and the necessity of flexibilization).

[219] See *supra* Section II.B.2.

[220] *See, e.g.*, Hetmank & Lauber-Rönsberg, *supra* note 73, at 581; Palace, *supra* note 65, at 237.

[221] *Cf.* Palace, *supra* note 65, at 237 (invalidation of rights if plaintiff "knowingly omitted proof of conception or the fact that he or she owns or uses artificial intelligence").

In addition, situations may occur where a creative work is the result of both human and artificial creative input—a "joint emergent work," so to speak, may then come into existence. This is the case where a human author or creator contributes to the autonomous AI process (or vice versa), such as in a human-AI jazz improvisation session. Also, independent contributions by different AI apparatuses—both acting autonomously—may combine to make a joint work. Structurally, this scenario is not unlike cases of human co-authorship. Hence, in principle, both categories of rights (copyright and neighboring right) may accrue with respect to joint emergent work of human-AI cooperation. It must be noted, however, that the preconditions, scope, and term of the rights at issue may vary. In addition, considering that a joint work may require actors' intention of merging the single contributions into inseparable or interdependent parts of a unitary whole, one would also have to inquire into the human contributor's state of mind and the will of the person having the power of disposition over the AI.[222]

CONCLUSION

As a consequence of the rapid development of AI technology, so-called emergent works (i.e., products of creative content created by autonomous AI) will increasingly be part of our socioeconomic, cultural, and political reality. So far, courts have not been confronted with the issue of protection for emergent works, and lawmakers still seem unaware of the issue. However, it may not be long before the first disputes reach the courts. Under current doctrine, no copyright protection exists for want of a human creator. The system of related and neighboring rights protection, such as for photographs or databases, offers a fragmentary regime. And unfair competition doctrine is patchy at best.

This regulatory void is problematic. First of all, economic analysis indicates a need for at least basic protection of AI creativity. Indeed, timely legislative action is required in order to provide an ecosystem

[222] *See supra* Section III.C.3. For the requirements for a "joint work" in U.S. law, see 17 U.S.C. § 101 (2018) and Community for Creative Non-Violence v. Reid, 490 U.S. 730 (1989). For German law, see German Copyright Act, *supra* note 72, § 8(1); and Schulze, *supra* note 73, § 8, para. 2. For a similar suggestion, based on the concept of a "fictional human author," see Wu, *supra* note 122, at 169-71.

that is conducive to AI innovation. Upon closer scrutiny, regulatory inactivity is especially irritating, for it cannot be justified by any of the traditional doctrinal counter-arguments against the extension of protection to new subject matter. The necessary black-letter amendment of the *lex lata* could best be effectuated by introducing a neighboring right for emergent works. The most intricate issues to be resolved would then be the term of protection, the transferability of the right, and the determination of who is the right-holder. Until lawmakers have acted, the fallback regime is unfair competition law. Under that system, emergent work protection may best be achieved by an extension of misappropriation doctrine.