

# BEYOND THE ALGORITHM: REDEFINING IP FOR THE AGE OF AI

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*The question of whether technological innovations and artistic creations made by or with the assistance of Artificial Intelligence and Deep Learning machines should be protected by intellectual property law remains unresolved. This paper addresses the normative issue of whether artistic creations generated by Artificial Intelligence and Deep Learning machines should be eligible for copyright protection, and argues that the human creators behind these technologies should hold the rights to such works. Throughout this paper, I explore a range of perspectives, often conflicting, and present my own conclusions. My analysis draws heavily on first-principles thinking, grounded in intellectual property theories, elucidating its objectives and rationales. I then apply this framework to the novel and unprecedented scenarios posed by modern technology and its unforeseen implications.*

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## INTRODUCTION

The rapid advancement of Artificial Intelligence (AI) and Machine Learning (ML) technologies has revolutionized various fields, including the creation of literary and artistic works. As these AI systems become increasingly sophisticated, capable of producing content that rivals human creativity, a critical question emerges: Should AI-generated works be protected under intellectual property (IP) law? This paper seeks to address this complex issue by examining the theoretical foundations of IP law, the operational mechanisms of AI and ML systems, and the potential implications of extending copyright protections to AI-generated works.

The primary objective of IP law is to promote human progress, creativity, and innovation by providing creators with exclusive rights to their works. However, the integration of AI into the creative process challenges traditional notions of authorship and originality, raising significant legal and ethical questions. This paper explores these challenges, considering both the arguments against and the arguments in favor of protecting AI-generated works under copyright law.

In Part I, we delve into the theoretical foundations of IP law, discussing its primary objectives and rationales. We then explore the specific characteristics of IP, particularly its intangible nature and the economic challenges it presents. In Part II, we examine the development and operational mechanisms of AI and ML systems, focusing on how these technologies function and the role of human involvement in their creations. Part III addresses the arguments against extending copyright protections to AI-generated works, analyzing concerns about incentives, creativity, and the historical context of copyright law. In Part IV, we present counterarguments in favor of protecting AI-generated works under copyright, emphasizing the significant role of human creators in the AI production process and the potential benefits of such protections. Finally, we conclude by summarizing our findings and discussing the broader implications for the future of IP law in the context of AI advancements.

## I. INTELLECTUAL PROPERTY THEORY

### A. Background

Four theories currently dominate theoretical writing about Intellectual Property (IP): utilitarianism, labor theory, personality theory, and social planning theory. However, only the first three are widely adopted in practice. Their prominence derives from the fact that they grow out of and draw support from lines of argument that have long figured in IP law.<sup>1</sup> Due to the humble scope of this paper, I will rely on the utilitarian justification of IP, which is the most prominent theoretical approach in common law countries today.

IP is a term that describes the category of property composed of all intangible creations of the human intellect. This defining ‘property,’ so to speak, of intellectual creations—their intangibility—is the reason they suffer from immutable disadvantages that other types of property do not. Unlike conventional types of property, the intangible nature of IP presents two unique problems. IP is: (i) *nonexclusive*, meaning that one cannot prevent others from consuming it; and (ii) *nonrivalrous*, meaning one’s supply is unaffected by the consumption of others. These characteristics of IP are the hallmark of what is known in economic theory as *public goods*.<sup>2</sup>

Of course, I use the word “suffer” not to imply that access to intellectual creations should be restricted, but rather to highlight that public goods are typically not provided by the private sector, leading to a fundamental shortage of such goods in private markets. Public goods are normally free for everyone to use *precisely because* they are nonexclusive and nonrivalrous by their nature. Therefore, private actors will not invest *ex ante* in the creation of such goods—everyone else would be able to “free ride” on their investment and enjoy the fruits of their labor without lifting a finger themselves.<sup>3</sup> Since private actors would not be able to supply them for a profit, this leads to what is known in economic theory as a *market failure*.<sup>4</sup> Therefore, it is left up to non-private actors (or public actors), such as governments, to provide public goods. A well-known example of a public good is security. If countries had no armies, each citizen individually would have no incentive to fund the creation of an army.<sup>5</sup> Since this group of individuals can’t seem to find anyone who is willing to pay for security due to this lack of *ex ante*

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<sup>1</sup>William Fisher. “Theories of Intellectual Property”. In *New Essays in the Legal and Political Theory of Property*, ed. by Stephen Munzer, 168. Cambridge: Cambridge University Press, 2001.

<sup>2</sup>Paul A. Samuelson. “The Pure Theory of Public Expenditure”. *The Review of Economics and Statistics* 36, no. 4 (Nov. 1954): 387.

<sup>3</sup>Garrett Hardin. “The Tragedy of the Commons”. *Science* 162, no. 3859 (1968): 1243–1248.

<sup>4</sup>Francis M. Bator. “The Anatomy of Market Failure”. *The Quarterly Journal of Economics* 72, no. 3 (Aug. 1958): 351.

<sup>5</sup>That is because everyone else would enjoy the benefits of security even without bearing any of the costs—no one in the country can be prevented from consuming and enjoying

incentives, governments take it upon themselves to provide security by building national armies and collecting taxes from the citizens to fund them.

However, the concept of IP rights as a legal tool takes a different approach to addressing its public-goods-shortcomings. As evidenced by the example of security, governments are usually the best providers of public goods, but that is not always the case. Specifically pertinent, governments are not necessarily the best providers of technological innovations or artistic creations. Although other governmental top-down tools, such as direct investments in R&D, support for artists, and prize-winning competitions, exist—they are primarily used by governments as supplements rather than the main engine of technological innovation and creative works.<sup>6</sup>

In practice, governments today almost exclusively rely on the incentives-regime provided by the institution of IP rights. They give private actors incentives in the form of legal rights (IP Rights or IPRs), legally making the intellectual creation the property of the inventor or author and restricting everyone else's use of that creation (a monopoly). Therefore, instead of providing this public good themselves, governments essentially privatize their responsibility by incentivizing private actors *ex ante* to create intellectual works on their own.

However, assigning intellectual creations to private actors in the form of property is not the primary objective of an IPRs regime. Rather, the goal is to promote *human* progress. Privatization and monopolization of intellectual creations by making them property is, therefore, both the price societies pay and the tool they choose to employ to achieve that objective. This inherently creates tension between the goal of human progress and the extent of legal protection for creators. The greater the incentive, the more it catalyzes the creation of additional works, but it also increasingly restricts public use of those works and potentially impedes further innovation. Conversely, smaller incentives may lead to lower motivation and fewer new creations but allow greater public access. This trade-off highlights the need to find a balance, or a social progress equilibrium, which every utilitarian-oriented legal system aims to achieve. Therefore, IPRs are only justifiable if the restrictions they impose are time-limited. Eternal protection of IPRs *ipso facto* undermines the goal of promoting human progress, as it benefits only the inventor and not society as a whole. Countries enforce IPR to incentivize inventors and authors to create *ex ante*. However, they aim to strike a balance by providing enough incentive to maximize creation while minimizing impediments to human progress. This equilibrium intended to be socially optimal in the long run, even if not in the short run. After a limited period during which the inventor or author holds a monopoly, creations will enter the public domain and become freely available to the public indefinitely.

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border security, while the consumption and enjoyment of one does not detract from those of others.

<sup>6</sup>Richard R. Nelson. "The Simple Economics of Basic Scientific Research". *Journal of Political Economy* 67, no. 3 (1959): 297–306.

## B. Assumptions and Observations

From this analysis, a few assumptions can be drawn. *First*, is that protection of IPR is only justified if it promotes innovation and creation of works for the welfare of *all people* (and not just the inventors or the authors). Meaning it aims to optimize *social* welfare. When it impedes innovation or the creation of new works (either by a lack or excess of protection) more than it promotes it, it is no longer justified. *Second*, That is why only such actors who themselves promote the creation and innovation of new intellectual works—by responding to IPR incentives—should enjoy the protection of IPRs. *Third*, is that an *ex ante* perspective is the fulcrum of the Utilitarian analysis of IP theory and is key to understanding the rationals behind and the legitimacy of IP. One of the manifestations of this *ex ante* perspective is an *ex post* protection of IP. If inventors and authors know that IPRs are not effectively enforced when breached today, they will not invest *ex ante* (or invest sub-optimally) in the creation of new inventions and creations.

Despite the seemingly-monolithic portrayal of IP theory presented above, IP is divided to sub categories, the most important of which are Patents and Copyrights. Although the main objective of IP as described earlier holds true, each of these sub-categories has a more well-refined and nuanced purpose of its own. The objective of Patents is to promote new and useful compositions of matters—or in other words—to promote *technological* innovation.<sup>7</sup> This is a very industrially focused branch of IP in which the Utilitarian approach of IP is very prominent in most countries. The objective of Copyrights, according to the US Constitution, as interpreted in *Feist*, is<sup>8</sup>

## II. ARTIFICIAL INTELLIGENCE & DEEP LEARNING MACHINES

AI and ML are often used interchangeably to describe a field of computer science focused on developing programs that can learn from experience and enhance their performance over time.<sup>9</sup> However, the term "learning" in this context is metaphorical and can be misleading, as it may suggest that these programs possess human-like cognitive learning capabilities. In reality, although these algorithms optimize

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<sup>7</sup>35 U.S. Code § 101.

<sup>8</sup>U.S. Const. Art. I, §8, cl. 8, 1789; *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 346 (1991):

“to promote the progress of science and useful arts, by securing for limited times to authors . . . exclusive right to their . . . writings”. Therefore, “copyright is meant to promote human creativity”.

<sup>9</sup>Stuart Russell and Peter Norvig. *Artificial Intelligence: A Modern Approach*. 1st. Englewood Cliffs, NJ: Prentice Hall, 1995.

their performance based on experience, they operate without possessing any innate cognitive abilities or understanding; they function by identifying patterns and making adjustments based on mathematical models, rather than engaging in the kind of conscious, reflective learning that humans do.<sup>10</sup> Hence, “learning” refers only to the ability to enhance performance by identifying new or better patterns through the review of additional data. Virtually all AI and machine learning systems undergo training phases, during which they process large volumes of data to develop their capabilities before being deployed in practical applications.<sup>11</sup> As a result, these algorithms can produce intelligent results in complex tasks without possessing human-like cognition. A well-known example is spam-filtering algorithms for emails, which are optimized to detect spam without needing to understand the abstract concepts and deep meaning behind the words they filter.<sup>12</sup>

### III. ARGUMENTS AGAINST THE PROTECTION OF AI PRODUCTIONS

The rapid advancement of AI technologies has sparked significant debate about the implications of AI-generated works on IP law. As AI systems become rapidly capable of producing literary and artistic works, questions arise regarding the necessity and appropriateness of extending copyright protections to these creations.

#### A. Redundancy of Incentives

The first argument posits that AI machines do not require legal or financial incentives to run their code. Since no incentives regime is needed *ex ante*—because AI machines are indifferent to human-tailored incentives—the protection of AI productions with intellectual property rights (IPRs) would be redundant. This protection would only restrict public access without encouraging new creations, as AI does not operate on motivational frameworks akin to human creators.

#### B. Dilution of Human Creativity

The second argument starkly contrasts the first, suggesting that incentivizing AI-generated literary and artistic works not only fails to promote creativity but could also pose a significant threat to human progress. It asserts that IP protections would be excessively effective rather than redundant, potentially to the detriment of human creativity. Such protections could create a massive incentive for producing overwhelming amounts of machine-generated content, devoid of direct human

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<sup>10</sup>Tom M. Mitchell. *Machine Learning*. 1–19. New York: McGraw-Hill, 1997.

<sup>11</sup>Ian Goodfellow, Yoshua Bengio, and Aaron Courville, eds. *Deep Learning*. 97–112. Cambridge, MA: MIT Press, 2016.

<sup>12</sup>Olatunji Mumini Dada et al. “Machine learning for email spam filtering: review, approaches and open research problems”. *Heliyon* 5, no. 6 (2019).

input, thereby overshadowing human creativity. This deluge of content could undermine the core objective of copyright law, which is to promote human creativity by providing exclusive rights as a reward for original works.<sup>13</sup>

### C. *Human Centrality*

The third argument draws from the historical context of copyright, where the human author has always been central. From this human-centric perspective, copyright is designed to foster *human* creativity, entailing special IP protections for *human* creators. Since the creators of AI systems do not directly produce the artistic outputs of these machines, they should not be entitled to IPRs for these creations. This reinforces the notion that copyright's primary goal is to support human artistic and intellectual labor.

### D. *No Liability, No Rights*

The fourth argument is derived from the long-standing legal principle that rights and responsibilities are intertwined. AI machines should be denied copyrights, the argument goes, because they cannot be held liable for their productions. A legal person that cannot bear responsibility cannot enjoy rights. Since copyright law has historically linked copyright with potential liability, it follows that AI-generated works should not be protected under copyright law, as AI cannot assume liability.

### E. *Irreconcilability*

The fifth and final argument against the protection of AI productions is the most vehement one. It asserts that the very nature of copyright doctrine is fundamentally irreconcilable with the concept of non-human creators. Firstly, machines cannot *actually* make the creative choices required to generate originality on their own. As mentioned in Part II, what might *seem* to be a production eligible for protection is, in fact, not. Secondly, originality is an indissoluble tenet, a *sine qua non* of copyright law. Without the element of human creativity and originality, machine-generated works fail to meet the most essential criteria for copyright protection.

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<sup>13</sup>As said in the first chapter, promoting human progress is the umbrella objective of IP law.

## IV. ARGUMENTS FOR THE PROTECTION OF AI PRODUCTIONS

### A. *Necessity of Incentives*

The first argument, which asserts that AI machines require no legal or financial incentives to run their code, contrasts sharply with the reality of human involvement in AI development and operation. These algorithms, while sophisticated, do not operate consciously or autonomously; they function as tools utilized by human authors to create copyright-eligible works. Historically, humans have used tools to facilitate creation. While AI technology is more advanced than traditional tools like pens, it lacks true intelligence or autonomy in the human sense. Consequently, AI systems do indeed require legal and financial incentives because humans are responsible for running these algorithms. Without such incentives, there would be no motivation for humans to operate AI algorithms or to develop AI machines in the first place. However, this counterargument, of course, only holds water as long as one thinks that AI productions *should* be encouraged.

### B. *Enhancing Human Creativity*

The second argument posits that incentivizing AI-generated productions in the literary and artistic fields could threaten human creativity and, consequently, human progress. This concern arises from the belief that AI machines will predominantly produce works of "low creativity," which could flood the marketplace and overshadow human-created works. This market saturation could potentially marginalize professional writers, journalists, and other creators, thereby impoverishing society culturally and economically.

However, this argument is not without its challenges. The assumption that AI productions are inherently of "low creativity" lacks clear empirical support. Why should one assume that AI-generated works will always be of lesser quality? If AI productions are indeed inferior, they would not pose a significant threat to human creators in the marketplace. Conversely, if AI-generated works achieve high quality, it raises the question of why we should preemptively reject these contributions and hinder their creation. Furthermore, as long as there is human oversight and involvement in the development and operation of AI systems, the notion that the world would be devoid of creators seems unfounded. Human ingenuity and creativity are integral to the development and utilization of AI technologies, suggesting that AI could complement rather than replace human creativity.

Technological advances always disrupt markets, but this disruption does not imply that markets should resist change. Why should we assume that the participation of AI machines in the literary and artistic fields will impoverish the world? This assumption seems fallacious. Before the invention of the printing press, religious texts and books were crafted by specialized artisans. One could argue that the advent of the printing press made the world poorer by displacing these artisans



and diminishing the human touch in books. However, the printing press enabled faster production of books, allowing more people to access, purchase, and read them. This proliferation of books contributed significantly to the Enlightenment movement. Similarly, the AI revolution has the potential to positively impact the world by enhancing accessibility and efficiency in content creation. There seems to be no concrete evidence to suggest that AI advancements will have a negative impact; rather, history shows that technological progress can lead to widespread societal benefits.

It is also important to note that the first two arguments are inherently contradictory. On the one hand, the argument states that AI machines require no legal or financial incentives to run their code because they are indifferent to intellectual property (IP) incentives tailored for humans. On the other hand, the argument suggests that we should not grant IP rights to AI machines because doing so would create excessive incentives, potentially posing a threat to human creators and human progress.

If AI machines truly require no legal or financial incentives to run their code, then granting IP rights would not over-incentivize the creation of AI-produced works, nor would it flood the market with such creations. Conversely, if granting IP rights to AI productions does indeed incentivize more production, this implies that AI machines, or more accurately, the humans behind them, do require legal and financial incentives to operate these systems. At most, one of these arguments can theoretically hold true, but both cannot coexist. Either incentives play a role in AI production, or they do not.

### *C. Human Incidentalism*

The third argument is the historical argument, which contends that the history of copyright reveals its primary purpose is to promote human creativity. While this is indeed true, the argument extends further, asserting that the human author is central to the copyright equation and that this centrality implies copyright is meant exclusively to promote human creativity by giving special status or protections to human creators. However, this perspective overlooks an important aspect: never before in history has any thing other than humans created a book or an art piece. Additionally, this argument negates the role humans play in the production of AI-generated works. While AI may be the tool producing the work, it is humans who design, operate, and refine these AI systems, thus maintaining a pivotal role in the creative process.

Clearly, the issue at hand is whether AI should be considered merely a tool or an autonomous and intelligent entity. The absence of AI throughout most of human history, in my opinion, cannot be used as an argument against protecting its productions under IP law. The change in circumstances is what raises this question in the first place, not the answer to the question. While I agree that copyright is meant to promote human creativity, no compelling reason has been successfully advanced showing that extending copyright protection to AI-generated

works would undermine human creativity. Thus, dismissing the potential for AI productions to be protected under copyright seems like a leap of logic.

#### *D. Human Accountability*

The fourth argument asserts that AI machines should be denied copyright because machines cannot be held liable for their productions, emphasizing that rights and responsibilities go hand in hand. While I agree that rights and responsibilities are interconnected, I am not convinced that this warrants denying protection for AI productions. Given that it is humans who guide AI machines today, it is the humans behind the machines who respond to the incentives of IP law (or the lack thereof). Therefore, the individuals who create and operate AI machines should enjoy the rights and also bear the responsibility, potentially being liable for the AI's productions. If in the future an AI machine—and not a human—responds to IP incentives, this might lead to a different conclusion. However, for now, without *ex ante* incentives for humans, there would be no motivation to create AI machines, and consequently, no production of copyright-eligible works. To promote human creativity, copyright should incentivize such creations, allowing humans to enjoy the benefits and bear the associated responsibilities.

#### *E. Achieving Compatibility*

The fifth argument posits that copyright doctrine is inherently allergic to the notion of non-human authors, as machines cannot make the creative choices required to generate originality *per se*. However, as I have argued, although referred to as “AI productions” for the sake of this paper, these are essentially human productions, assisted to varying degrees by AI machines. Teams of programmers, writers, and artists collaborate within companies to create AI systems capable of generating such works. While AI machines themselves may not make creative choices like human authors, the people behind them do. The guiding human hand behind AI responds to incentives *ex ante* and chooses to create AI systems with the purpose of producing literary and artistic works. These companies do not simply press a button to produce an additional work. The human oversight and intervention in AI operations suggest that machines assembling other works are not authors, infringers, or anything other than tools utilized by inventive or infringing humans. Therefore, the protection of AI-assisted productions is not incompatible with copyright law doctrine. As such, these works meet the originality requirement, given the significant human input and creative direction involved.

### **CONCLUSION**

For these reasons, I argue that AI-generated productions should be protected under copyright law, with the intellectual property rights (IPRs) belonging to the humans

who operate and guide these AI systems. While this conclusion is open to further debate beyond the scope of this paper, I hope to have convincingly demonstrated that this approach is the most reasonable. Ideally, I have persuaded you that protecting AI productions under copyright and awarding IPRs to the humans behind the machines not only acknowledges their creative contributions but also aligns with the fundamental goals of IP law in promoting innovation and creativity.

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