

## What is an Author Now? Non-Human Creativity and the Existential Crisis of Intellectual Property Law

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**ABSTRACT:** Intellectual property (IP) law, historically grounded in an anthropocentrism framework rewarding human ingenuity, faces a fundamental challenge from creative works generated by non-human agents in the form of “posthuman intellects”, especially sophisticated Artificial Intelligence (AI). This paper aims to critically examine the growing inadequacy of traditional IP doctrines in this new context and explore potential legal and philosophical recalibrations. Employing a documentary analysis methodology, the study reviews legal frameworks, seminal case law (e.g., *Naruto v. Slater*, *DABUS* discussions), academic literature, and IP office reports. The results indicate that current IP systems are ill-equipped for AI-generated creations, with landmark examples underscoring the system's inflexibility. The rapid advancement of generative AI intensifies this issue, suggesting that denying any form of IP recognition to AI outputs could create legal vacuums and disincentivize innovation. The principal conclusion is that an urgent, multidisciplinary, and international debate is imperative. This debate must address whether AI can or should be recognized as an IP subject or if a novel *sui generis* framework is required, necessitating a foundational reconsideration of “author”, “inventor”, and the core purpose of IP in an era of evolving creativity.

**KEYWORDS:** Artificial intelligence; authorship; generative AI; intellectual property; non-human creativity.

**CONTENTS:** 1. Introduction; – 2. Materials and methods; – 3. Results; – 3.1. Formatting of mathematical components; – 3.2. The intellectual property in the age of artificial intelligence; – 3.3. The case of *PETA v. David Slater*: copyright entitlement and non-human authorship; – 3.4. The *DABUS* cases: artificial intelligence as creator and inventor; – 4. Discussion; – 5. Conclusions; – References.

**TÍTULO:** *O que é um autor agora? Criatividade não-humana e a crise existencial do direito de propriedade intelectual*

**RESUMO:** *O Direito de Propriedade Intelectual (PI), historicamente fundamentado em um quadro antropocêntrico que recompensa a engenhosidade humana, enfrenta um desafio fundamental a partir de obras criativas geradas por agentes não-humanos na forma de “intelectos pós-humanos”, especialmente a sofisticada Inteligência Artificial (IA). Este artigo visa examinar criticamente a crescente inadequação das doutrinas tradicionais de PI neste novo contexto e explorar potenciais recalibrações jurídicas e filosóficas. Empregando uma metodologia de análise documental, o estudo revisa quadros legais, jurisprudência seminal (por exemplo, *Naruto v. Slater*, discussões sobre o *DABUS*), literatura acadêmica e relatórios de escritórios de PI. Os resultados indicam que os atuais sistemas de PI estão mal equipados para criações geradas por IA, com exemplos marcantes que sublinham a inflexibilidade do sistema. O rápido avanço da IA generativa intensifica esta questão, sugerindo que negar qualquer forma de reconhecimento de PI aos resultados da IA pode criar vazios legais e desincentivar a inovação. A principal conclusão é que um debate urgente, multidisciplinar e internacional é imperativo. Este debate deve abordar se a IA pode ou deve ser reconhecida como um sujeito de PI ou se é necessário um novo quadro *sui generis*, exigindo uma reconsideração fundamental dos termos “autor”, “inventor” e do propósito central da PI em uma era de criatividade em evolução.*

**PALAVRAS-CHAVE:** *Inteligência artificial; autoria; IA generativa; propriedade intelectual; criatividade não humana.*

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*SUMÁRIO: 1. Introdução; – 2. Materiais e métodos; – 3. Resultados; – 3.1. Formatação de componentes matemáticos; – 3.2. Propriedade intelectual na era da inteligência artificial; – 3.3. O caso PETA vs. David Slater: direitos autorais e autoria não humana; – 3.4. Os casos DABUS: inteligência artificial como criadora e inventora; – 4. Discussão; – 5. Conclusões; – Referências.*

## 1. Introduction

The dawn of sophisticated Artificial Intelligence (AI) has thrust humanity to the precipice of a new era, one where the traditional boundaries of creativity, authorship, and ownership are increasingly blurred. The “Rise of the Machines”, a concept once confined to the speculative realms of science fiction, is rapidly materializing in the form of “posthuman intellects” – AIs capable of autonomous decision-making and creative generation. This technological ascent, exemplified by cinematic explorations like Terminator's Skynet or the unsettlingly sentient Ava in Ex-Machina, forces a critical re-evaluation of existing Intellectual Property (IP) frameworks. As AI evolves from mere tool to potential creator, the very essence of IP law, designed to protect and incentivize human ingenuity, faces unprecedented challenges, navigating a landscape increasingly populated by non-human intelligence and the “hyperrealities” they can construct.

In this context, for centuries the architecture of IP rights, encompassing copyright, patent, and related doctrines, has been firmly anchored in an inherently anthropocentric foundation: the human author, the human inventor, serving as the singular locus of ingenuity deemed worthy of legal recognition and reward. This traditional paradigm is deeply rooted in philosophical justifications, from Lockean labor theory to utilitarian rationales and the romantic notion of authorship, all invariably centering the human creator. Consequently, legal doctrines such as “originality” in copyright have consistently been interpreted as necessitating a human author exercising independent skill, labor, and judgment. However, the recent and accelerating emergence of non-human agents capable of generating ostensibly original works – ranging from fortuitous wildlife photographs to complex inventions devised by sophisticated AI – is progressively eroding these foundational assumptions. This development compels a critical re-evaluation of IP law's core tenets and its future trajectory.

This paper is guided by the central question: How does the rise of creative output from non-human agents in the form of posthuman intellects, especially advanced Artificial Intelligence, challenge the anthropocentric foundations of intellectual property law,

and what are the implications for the future of IP frameworks? The primary objective of this paper is to critically examine the growing inadequacy of traditional intellectual property doctrines when confronted with creative works produced by non-human entities, focusing primarily on the profound disruptions caused by artificial intelligence. It seeks to explore the legal and philosophical challenges arising from this technological shift and to outline the urgent need for a re-evaluation of fundamental IP concepts.

To achieve this, a documentary analysis methodology will be employed. This will involve a review of existing legal frameworks, seminal case law (such as *Naruto v. Slater* and judicial considerations of AI systems like DABUS),<sup>1</sup> contemporary academic literature, reports from intellectual property offices, and philosophical treatises on authorship and inventorship. The analysis reveals that current IP systems, predicated on human creativity, are ill-equipped to handle the nuances of non-human, particularly AI-generated, creations. Incidents like the “monkey selfie” and the inventive claims made for AI systems like DABUS, while distinct, both underscore the inherent limitations and inflexibility of an IP regime conceived when human exclusivity in creation was undisputed. The exponential advancement of generative AI, capable of producing outputs often indistinguishable from human endeavors, transforms this issue into one of pressing contemporary concern. Systematically denying any form of IP recognition for AI-generated works may lead to unintended consequences, such as disincentivizing investment in creative AI or creating legal vacuums around valuable outputs.

In conclusion, the emergence of creative non-human agents, in the form of posthuman intellects, presents a fundamental, existential challenge to the anthropocentric premises of intellectual property law. The findings affirm that the current legal stance of IP offices and courts, while sound under existing statutes, represents a temporary solution to a rapidly intensifying problem. There is an imperative and urgent need for a profound, multidisciplinary, and international debate to address whether machines or AI can, and under what conditions should, be recognized as subjects of IP rights, or if a novel *sui generis* regime is required. This necessitates a courageous reconsideration of the very definitions of “author” and “inventor” and the fundamental purposes of intellectual property in an era of increasingly blurred lines between human and machine-driven creation.

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<sup>1</sup> UNITED STATES COURT OF APPEALS FOR THE NINTH CIRCUIT. *Naruto v. Slater*, 888 F.3d 418, j. 23.04.2018

## 2. Materials and methods

This paper employed a qualitative research design centered on an exhaustive documentary analysis to address the guiding research question and achieve the stated objectives. The documentary analysis focused on systematically identifying, retrieving, reviewing, and synthesizing relevant information from a diverse range of primary and secondary sources. This approach was deemed appropriate for exploring the complex legal, philosophical, and technological intersections of non-human agency, particularly artificial intelligence, and intellectual property law.

The information gathering process involved a structured search strategy across several prominent academic and legal databases. Specifically, HeinOnline was utilized for its extensive collection of legal journals, case law, and statutory materials. EBSCOhost (encompassing databases like Academic Search Complete and Business Source Complete), Scopus, and Web of Science (WoS) were accessed to gather peer-reviewed academic articles, conference proceedings, and scholarly books, ensuring a broad multidisciplinary perspective encompassing law, technology, ethics, and philosophy. A strategic selection of keywords was used to query these databases. Core search terms included: “intellectual property”, “copyright”, “patent”, “authorship”, “inventorship”, “artificial intelligence”, “AI”, “generative AI”, “non-human agents”, “legal frameworks”, “IP rights”, and specific case/system identifiers such as “monkey selfie”, “*Naruto v. Slater*”, and “DABUS”. To refine and optimize search results, Boolean operators (AND, OR, NOT) were systematically applied. For instance, queries were structured as: (“intellectual property” OR “copyright” OR “patent”) AND (“artificial intelligence” OR “AI” OR “generative AI”) AND (“authorship” OR “inventorship” OR “legal challenges”). Operator NOT was used sparingly to exclude irrelevant fields where necessary.

The selection of documents for inclusion was guided by criteria of relevance to the research question, the academic rigor and credibility of the source, and the contemporaneity of the information, given the rapidly evolving nature of AI technology and its legal implications. Furthermore, a process of information triangulation was undertaken. This involved comparing data, arguments, and conclusions drawn from different types of sources (e.g., legal rulings, academic papers, IP office reports, philosophical analyses) and across various jurisdictions and scholarly perspectives. This cross-verification aimed to enhance the validity and reliability of the findings, allowing for a more nuanced and comprehensive understanding of the challenges and potential pathways for adapting IP law to non-human creativity. The synthesis of these

triangulated sources forms the basis of the analysis and conclusions presented in this paper.

### 3. Results

#### 3.1. Formatting of mathematical components

At the heart of the debate lies the fundamental question of authorship and ownership in the context of AI-generated works. Traditionally, copyright law has vested authorship in human creators, the “person” who translates an idea into a tangible expression. However, as AI systems become capable of producing complex literary, artistic, and musical works with minimal or ostensibly no direct human intervention, the applicability of this anthropocentric model diminishes. The “posthuman intellect”, in this sense, is not merely a sophisticated software program but an entity that can learn, adapt, and “create” in ways that challenge the foundational requirement of human intellectual effort. This raises crucial questions: Can an AI be an author? If so, who owns the copyright to its creations – the programmer, the user who provided the initial prompt, the AI itself, or does the work fall into the public domain?

Before delving into the unique circumstances and legal questions posed by cases such as *PETA v. David Slater* or DABUS, it is essential to establish a foundational understanding of IP law. IP, in its broadest sense, refers to creations of the mind: inventions, literary and artistic works, designs, symbols, names, and images used in commerce.<sup>2</sup> Unlike tangible property like land or goods, IP is intangible, representing the proprietary rights vested in these intellectual creations.<sup>3</sup> The legal frameworks governing IP are designed primarily to incentivize innovation and creativity by granting creators certain exclusive rights over their productions, thereby allowing them to benefit from their work and fostering societal progress through the dissemination of new ideas and cultural expressions.<sup>4</sup>

Intellectual property law is conventionally categorized into several primary domains, each addressing different types of creations and offering distinct forms of protection.

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<sup>2</sup> ARAI, Yasuhiro; KINUKAWA, Shinya. Copyright infringement as user innovation. *Journal of Cultural Economics*, vol. 38, n. 2. Heidelberg: Springer, 2014, p. 131-144. See also NOVOS, Ian E.; WALDMAN, Michael. The effects of increased copyright protection: an analytic approach. *Journal of Political Economy*, vol. 92, n. 2. Chicago: University of Chicago Press, 1984, p. 236-246.

<sup>3</sup> SCOTCHMER, Suzanne. Standing on the shoulders of giants: cumulative research and the patent law. *Journal of Economic Perspectives*, vol. 5, n. 1. Nashville: American Economic Association, 1991, p. 29-41.

<sup>4</sup> TOWSE, Ruth; HANDKE, Christian; STEPAN, Paul. The economics of copyright law: a stocktake of the literature. *Review of Economic Research on Copyright Issues*, vol. 5, n. 1, 2008, p. 1

Patents protect new inventions, such as processes, machines, manufactures, or compositions of matter, granting inventors exclusive rights to make, use, sell, and import their inventions for a limited period. Trademarks, on the other hand, protect words, names, symbols, sounds, or colors that distinguish goods and services of one party from those of others, thereby safeguarding brand identity and preventing consumer confusion. Other forms of IP include trade secrets (confidential business information) and industrial designs (the ornamental or aesthetic aspect of an article). However, for discussions concerning creative expression, such as photographs, the most pertinent branch of IP is copyright.

Copyright is a legal right granted to the creator of original works of authorship, including literary, dramatic, musical, artistic, and certain other intellectual works, both published and unpublished.<sup>5</sup> This protection automatically arises the moment a work is “fixed” in a tangible medium of expression, meaning it has been set down in a sufficiently permanent form from which it can be perceived, reproduced, or otherwise communicated. Copyright law grants the author or creator a bundle of exclusive rights, typically including the right to reproduce the work, to prepare derivative works based upon it, to distribute copies to the public, and to perform or display the work publicly.<sup>6</sup>

Central to copyright protection are two fundamental concepts: originality and authorship. For a work to be copyrightable, it must be “original”, which means it must be independently created by the author (i.e., not copied from other works) and possess at least a minimal degree of creativity. The threshold for originality is generally low, but it is a prerequisite. Equally critical is the concept of “authorship”. Traditionally, and within virtually all legal systems, the “author” is understood to be the human being (or beings) who brought the work into existence through their intellectual labor, skill, and judgment. This anthropocentric view of authorship assumes that creativity, for the purposes of legal recognition and reward, emanates from human intellect and effort.<sup>7</sup>

These core principles – the nature of IP as intangible creations, the distinct categories like patents and trademarks, and especially the copyright doctrines of fixation,

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<sup>5</sup> ELHAUGE, Einer. Do patent holdup and royalty stacking lead to systematically excessive royalties?. *Journal of Competition Law and Economics*, vol. 4, n. 3. Oxford: Oxford University Press, 2008, p. 535-570. See also RAUSTIALA, Kal; SPRIGMAN, Christopher. The piracy and paradox: innovation and intellectual property in fashion design. *Virginia Law Review*, vol. 92. Charlottesville: Virginia Law Review Association, 2006, p. 1687.

<sup>6</sup> LANDES, William M.; POSNER, Richard A. An economic analysis of copyright law. *The Journal of Legal Studies*, vol. 18, n. 2. Chicago: University of Chicago Press, 1989, p. 325-363.

<sup>7</sup> KHAN, B. Zorina. *The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920*. Cambridge: Cambridge University Press, 2005.

originality, and human authorship – form the bedrock upon which IP law operates. It is this last pillar, the inherent assumption of human authorship, that comes under scrutiny in unconventional scenarios, challenging the traditional boundaries of who, or indeed what, can be recognized as a creator in the eyes of the law.

### 3.2. The intellectual property in the age of artificial intelligence

As mentioned above, the realm of human ingenuity has long been safeguarded and spurred by a specialized body of law known as IP. At its core, the primary purpose of IP law is twofold: to recognize and reward creators for their intellectual labor, and to incentivize further innovation and creativity for the broader benefit of society. Traditionally, this framework has revolved around distinct categories, most notably copyright, which protects original works of authorship (like books, music, and art); patents, which grant exclusive rights for new and useful inventions; and trademarks, which protect brand identifiers. A fundamental, albeit often implicit, assumption underpinning these rights has always been the human origin of the creative or inventive act – the “author” or “inventor” as a human being.

Parallel to this established legal domain, the 21st century has witnessed the meteoric rise of AI, a field of computer science dedicated to creating systems capable of performing tasks that typically require human intelligence.<sup>8</sup> While AI has existed for decades, recent advancements, particularly in machine learning and neural networks, have led to the emergence of Generative AI.<sup>9</sup> These sophisticated AI models can now autonomously produce a wide array of novel content, including coherent text, intricate visual art, complex musical compositions, and even functional software code or scientific hypotheses.<sup>10</sup> From large language models that can write essays to image generators that

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<sup>8</sup> STROWEL, Alain. *Study on Copyright and New Technologies: Copyright Data Management and Artificial Intelligence*. Luxembourg: Publications Office of the European Union, 2022.

<sup>9</sup> SAFNER, Ryan. Honor among thieves: how 19th century American pirate publishers simulated copyright protection. *Economics of Governance*, n. 24. Heidelberg: Springer, 2023, p. 119–141. See also MILITSYNA, Kateryna. Human creative contribution to AI-based output—one just can’t get enough. *GRUR International*, vol. 72, n. 10. Oxford: Oxford University Press, 2023, p. 939-949; KIM, Daria. ‘AI-generated inventions’: time to get the record straight?. *GRUR International*, vol. 69, n. 5. Oxford: Oxford University Press, 2020, p. 443-456; HANDKE, Christian. Intellectual property in creative industries: the economic perspective. In: BROWN, Abbe E. L.; TOWSE, Ruth (Org.). *Research Handbook on Intellectual Property and Creative Industries*. Cheltenham: Edward Elgar Publishing, 2018, p. 57-76.

<sup>10</sup> ACEVEDO-CAICEDO, Francisco J.; VARGAS-CHAVES, Iván. Derecho, robótica e inteligencia artificial: luces y sombras sobre una futura regulación de la personalidad de los robots humanoides. *Law, State & Telecommunications Review/Revista de Direito, Estado e Telecomunicações*, vol. 16, n. 2. Brasília: Universidade de Brasília, 2024, p. 295–320.

create photorealistic pictures from textual prompts, AI's capacity to “create” is rapidly expanding, blurring lines previously thought to be clearly delineated.<sup>11</sup>

The convergence of these two domains – the human-centric legal framework of IP and the burgeoning creative capacity of non-human AI – precipitates a host of elementary yet profound questions. If an AI system generates a compelling novel or a groundbreaking invention, who, if anyone, is the “author” or “inventor” in the eyes of the law? Can an AI, a non-legal entity devoid of human consciousness or intent, hold IP rights? Or should such rights accrue to the AI's developers, the users who prompt its creations, or should these works immediately enter the public domain, free for all to use? These questions are not merely academic; they strike at the heart of how IP law functions. This intersection immediately brings several key IP concepts into sharp focus and potential conflict. Originality, a cornerstone of copyright, typically implies a modicum of human intellectual effort and independent creation.<sup>12</sup> Can a work generated by an algorithm, however sophisticated, truly be “original” in this human-derived sense? Similarly, authorship (for copyright) and inventorship (for patents) are legal statuses traditionally reserved for human individuals.<sup>13</sup> Current legal frameworks are largely unprepared for non-human claimants in the form of posthuman intellects. Furthermore, the IP system's reliance on incentives is challenged: if AI can produce creative output efficiently and at scale, how does this affect the incentive structure designed to encourage human effort? Moreover, questions arise regarding infringement: if an AI is trained on vast datasets of existing copyrighted works, what are the implications if its outputs are substantially similar to that training data? Who is liable for such infringement – the AI, its developer, or its user?

Understanding these fundamental concepts of intellectual property – its purpose, its main forms, and its core requirements like originality and human authorship – alongside

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<sup>11</sup> ARNOLD, Carrie. Inside the nascent industry of AI-designed drugs. *Nature Medicine*, vol. 29. London: Nature Publishing Group, 2023, p. 1292–1295. See also GIORCELLI, Michela; MOSER, Petra. Copyrights and creativity: evidence from Italian opera in the Napoleonic age. *Journal of Political Economy*, vol. 128, n. 11. Chicago: University of Chicago Press, 2020, p. 4163–4210; COCKBURN, Iain M.; HENDERSON, Rebecca; STERN, Scott. The impact of artificial intelligence on innovation: an exploratory analysis. In: AGRAWAL, Ajay; GANS, Joshua; GOLDFARB, Avi (Org.). *The economics of artificial intelligence: An agenda*. Chicago: University of Chicago Press, 2019, p. 115–146.

<sup>12</sup> MITRA-KAHN, Benjamin. Economic reasons to recognise AI inventors. In: ABBOTT, Ryan (Org.). *Research Handbook on Intellectual Property and Artificial Intelligence*. Cheltenham: Edward Elgar Publishing, 2022, p. 376–390. See also BUITEN, Miriam; DE STREEL, Alexandre; PEITZ, Martin. The law and economics of AI liability. *Computer Law & Security Review*, vol. 48. Amsterdam: Elsevier, 2023, p. 105794; BESIROGLU, Tamay; EMERY-XU, Nicholas; THOMPSON, Neil. Economic impacts of AI-augmented R&D. *Research Policy*, vol. 53, n. 7. Amsterdam: Elsevier, 2024, p. 105037.

<sup>13</sup> CHUN, Mattew. How artificial intelligence is revolutionizing drug discovery. *Bill of Health, Harvard Law School Petrie-Flom Center*. Cambridge: Harvard Law School, 2023.

the nascent creative capabilities of artificial intelligence is crucial for appreciating the complex legal and ethical challenges that lie ahead.

### **3.3. The case of PETA v. David Slater: copyright entitlement and non-human authorship**

In 2011, British nature photographer David Slater embarked on an expedition to Indonesia with the aim of capturing images of crested black macaques. During his fieldwork, he configured his camera equipment in such a manner that the inquisitive primates could interact with it. One macaque, whom Slater later identified as Naruto, took possession of the camera and repeatedly triggered the shutter, producing several photographs, including a series of self-portraits (“selfies”) of notable clarity and expressiveness. These images rapidly gained viral status. The ensuing conflict arose when Slater sought to assert his copyright claim over these photographs. Various entities, including Wikimedia Commons, contended that because Slater himself had not actuated the shutter, he could not claim authorship, and consequently, the images belonged to the public domain.

The situation escalated in 2015 when People for the Ethical Treatment of Animals (PETA) filed a lawsuit on behalf of Naruto in a California federal court against David Slater, his company Wildlife Personalities Ltd., and the publisher Blurb, Inc., which had featured the photographs in a book. PETA maintained that Naruto was the author of the photographs and, therefore, the legitimate copyright holder, requesting that the court permit PETA to administer any revenue derived from the images for the benefit of Naruto and his macaque community. PETA's argument was predicated on an expansive interpretation of the United States Copyright Act, suggesting that the absence of an explicit prohibition against non-human authorship allowed for such recognition. However, the U.S. Copyright Office had previously clarified its stance in the *Compendium of U.S. Copyright Office Practices*, stating it would only register works created by human beings and explicitly stipulating that it “will not register works produced by nature, animals, or plants”.<sup>14</sup> This guide indicated, for example, that a mural painted by an elephant or a piece of driftwood sculpted by the ocean would not be eligible for copyright protection.

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<sup>14</sup> U.S. COPYRIGHT OFFICE. *Compendium of U.S. Copyright Office practices*. 3. ed. Washington: U.S. Copyright Office, 2021.

In 2016, the U.S. District Court for the Northern District of California dismissed PETA's lawsuit, reasoning that the Copyright Act did not extend to animals. Judge William Orrick noted that while Congress and the President *could* extend legal protections to animals, there was no indication that they *had* done so within the extant copyright legislation. PETA subsequently appealed this decision to the U.S. Court of Appeals for the Ninth Circuit. In 2018, before a final judgment on the appeal was rendered, the parties reached a settlement: Slater agreed to donate 25% of future revenues generated by the “monkey selfies” to charitable organizations dedicated to the protection of crested macaques in Indonesia. Notwithstanding the settlement, the Ninth Circuit opted to issue its ruling, affirming the lower court's decision and firmly establishing that animals lack standing to sue under the Copyright Act. The court also criticized PETA for allegedly using Naruto as a “pawn” to advance its ideological objectives.

The *PETA v. Slater* case brought several fundamental issues to the fore:<sup>15</sup> Firstly, it reaffirmed the deeply entrenched principle of human authorship as a prerequisite for copyright protection in most jurisdictions. Protectable creativity, according to this traditional view, emanates from human intellect – an “original intellectual conception” that a machine or an animal, regardless of the complexity of its actions, does not possess. Secondly, it exposed the inherent difficulty in ascribing creative intent, in the manner required by law, to a non-human entity in the form of posthuman intellect. Did Naruto possess the intent to create an artistic work, or was its interaction with the camera merely a display of curiosity towards an unfamiliar object? Finally, the case, though situated in a biological context, served as an important precursor to the more complex debates surrounding authorship that would later intensify with the rise of artificial intelligence.

#### **3.4. The DABUS cases: artificial intelligence as creator and inventor**

The development of these posthuman intellects also ushers in the era of “hyperrealities”, a concept where the distinction between the real and the artificial, the original and the copy, become increasingly fluid. AI's ability to generate photorealistic images, deepfake videos, and sophisticated textual narratives that mimic human styles with uncanny accuracy poses a significant threat to the integrity of information and the traditional notions of originality that underpin IP law. In a world saturated with AI-generated content, how do we determine authenticity? How do we protect existing copyrighted works from being ingested and transformed by AI models, potentially leading to

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<sup>15</sup> UNITED STATES COURT OF APPEALS FOR THE NINTH CIRCUIT. *Naruto v. Slater*, 888 F.3d 418, j. 23.04.2018.

derivative works that are difficult to trace and regulate? The creation of these hyperrealities not only challenges copyright's originality requirement but also has profound implications for trademark law (through AI-generated branding) and the right of publicity (through unauthorized AI-generated likenesses).

Dr. Stephen Thaler, a physicist and pioneer in artificial intelligence, developed DABUS (Device for the Autonomous Bootstrapping of Unified Sentience). Thaler asserts that DABUS is an AI system capable of the autonomous and independent generation of creations and inventions, without specific human direction for any output. He contends that DABUS transcends its role as a sophisticated tool, functioning instead as a veritable “invention machine” that simulates human cognitive processes to conceive novel ideas. Driven by this conviction, Thaler initiated a global campaign to secure legal recognition for DABUS as both the author of an artistic work and the inventor of several patents.

*4.3.1 DABUS as Author: The Copyright Challenge* Thaler sought to register a visual artwork titled “A Recent Entrance to Paradise”, generated by DABUS, with the U.S. Copyright Office. The application identified DABUS as the author, with copyright ownership to be transferred to Thaler as the machine's owner. In 2019, the U.S. Copyright Office rejected the application, reiterating its long-standing position that copyright protection necessitates human creation. The Office reasoned that the law requires a “human nexus” – that the work must stem from the mental conception of a human author. Thaler’s subsequent appeals were unsuccessful; both the Copyright Office Review Board and later the U.S. District Court for the District of Columbia (in *Thaler v. Perlmutter*, 2023) upheld the rejection. These decisions underscored that U.S. copyright law premises authorship on human creativity, with Judge Beryl A. Howell's 2023 ruling definitively stating, “human authorship is a bedrock requirement of copyright”.<sup>16</sup>

*4.3.2 DABUS as Inventor: The Patent Conundrum* Concurrently, Thaler pursued patent protection for two inventions allegedly conceived by DABUS: a food container based on fractal geometry and a light beacon designed to enhance attention in emergencies (the “Neural Flame”). Patent applications designating DABUS as the inventor were filed in numerous jurisdictions. The responses from patent offices globally have been largely negative, albeit with some interesting nuances:

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<sup>16</sup> UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA. *Thaler v. Perlmutter*, 659 F. Supp. 3d 34, j. 18.08.2023.

*United States.* The U.S. Patent and Trademark Office rejected the applications, asserting that U.S. law defines an “inventor” as an “individual” or “individuals” – terms historically interpreted within patent law to denote human beings. This position was affirmed by the District Court for the Eastern District of Virginia and subsequently, in 2022, by the Court of Appeals for the Federal Circuit in *Thaler v. Vidal*.<sup>17</sup> The Federal Circuit held that the Patent Act unequivocally requires an inventor to be a human being. The U.S. Supreme Court declined to review the case in 2023.

*United Kingdom.* Similarly, the United Kingdom Intellectual Property Office and British courts, culminating in a December 2023 Supreme Court ruling (*Thaler v Comptroller General of Patents, Designs and Trademarks*), concluded that an inventor under UK patent law must be a natural person.<sup>18</sup>

*European Patent Office.* The European Patent Office also dismissed the applications, reasoning that the European Patent Convention necessitates an inventor to be a person with legal capacity, thereby excluding machines. The European Patent Office’s Legal Board of Appeal upheld this stance.<sup>19</sup>

*Australia.* Australia presented a notable, albeit temporary, divergence. In 2021, a Federal Court judge initially ruled that an AI could be recognized as an inventor under Australian patent law.<sup>20</sup> However, this landmark decision was overturned in 2022 by the Full Court of the Federal Court, and the High Court of Australia subsequently denied leave to appeal, aligning Australia with the prevailing international consensus.<sup>21</sup>

*South Africa.* South Africa stands as an outlier, having granted a patent in 2021 listing DABUS as the inventor.<sup>22</sup> It is crucial to note, however, that South Africa employs a non-examining patent system for certain substantive requirements. Consequently, the grant did not entail a profound legal analysis of inventorship nature but rather indicated compliance with registration formalities.

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<sup>17</sup> UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT. *Thaler v. Vidal*, 43 F.4th 1207, j. 05.08.2022.

<sup>18</sup> SUPREME COURT OF THE UNITED KINGDOM. *Thaler v. Comptroller General of Patents, Designs and Trademarks*, [2023] UKSC 49, j. 20.12.2023.

<sup>19</sup> EUROPEAN PATENT OFFICE. Legal Board of Appeal, Decision in case J 0008/20 (Artificial intelligence inventor/DABUS), j. 21.12.2021.

<sup>20</sup> FEDERAL COURT OF AUSTRALIA. *Thaler v. Commissioner of Patents*, [2021] FCA 879, j. 30.07.2021.

<sup>21</sup> FULL COURT OF THE FEDERAL COURT OF AUSTRALIA. *Commissioner of Patents v. Thaler*, [2022] FCAFC 62, j. 13.04.2022.

<sup>22</sup> THALER, Stephen L. *Patent for an invention entitled: “Food container” and “Devices and methods for attracting enhanced attention”*. South Africa Patent No. 2021/03242, 28 jul. 2021.

The DABUS cases, spanning both copyright and patent law, have compelled legal institutions worldwide to directly confront whether AI can be recognized as a creator or inventor. To date, the predominant response has been a firm negative, rooted in the interpretation that existing intellectual property laws were conceived by and for human beings. These decisions underscore that, under the current paradigm, AI is largely viewed as a sophisticated tool; any protectable creative or inventive output is attributed to the human(s) who utilized, programmed, or directed it. Nevertheless, Thaler's assertion that DABUS operates with a degree of autonomy transcending mere instrumentality poses a persistent and fundamental challenge to these established legal frameworks.

#### 4. Discussion

For centuries, the very architecture of IP rights – spanning copyright, patent, and related doctrines – has been predicated upon an inherently anthropocentric foundation: the human author, the human inventor, the singular locus of ingenuity worthy of legal recognition and reward.<sup>23</sup> However, the emergence of non-human agents – in the form of posthuman intellects – capable of generating ostensibly original works, ranging from the fortuitous wildlife photographs to the complex inventions of sophisticated AI, is progressively eroding these foundational assumptions, compelling a critical re-evaluation of IP law's core tenets and future trajectory.<sup>24</sup>

The traditional paradigm of IP law is deeply rooted in philosophical justifications that invariably center the human creator. Lockean labor theory, for instance, posits that individuals gain rights to the fruits of their intellectual labor, a concept that presupposes a human laborer.<sup>25</sup> Similarly, utilitarian rationales emphasize the necessity of incentives to encourage human individuals to engage in creative and inventive endeavors for the ultimate benefit of society.<sup>26</sup> Even the romantic notion of authorship, which valorizes the unique genius and originality of the individual creator, inherently ties creative output to

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<sup>23</sup> PREM, Erich. Artificial intelligence for innovation in Austria. *Technology Innovation Management Review*, vol. 9, n. 12. Ottawa: Carleton University, 2019, p. 5–15. See also YILMAZ, Erdem Dogukan; NAUMOVSKA, Ivana; AGGARWAL, Vikas A. AI-driven labor substitution: evidence from google translate and ChatGPT. *SSRN*, n. 4442406, 2023; DUFFY, John. Why business method patents?. *Stanford Law Review*, vol. 63. Stanford: Stanford Law Review, 2010, p. 1247–1288.

<sup>24</sup> KHAN, Faham Ahmed. Intellectual property rights for software, artificial intelligence and computer related inventions: a comparative analysis. *Journal of Intellectual Property Rights*, vol. 29, n. 1. New Delhi: CSIR-NIScPR, 2024, p. 57-66. See also MEZZANOTTI, Filippo; SIMCOE, Timothy. *Innovation and Appropriability: Revisiting the Role of Intellectual Property*. Cambridge: National Bureau of Economic Research, 2023.

<sup>25</sup> LOCKE, John. *Two Treatises of Government and a Letter Concerning Toleration*. New Haven: Yale University Press, 2003.

<sup>26</sup> LANDES, William M.; POSNER, Richard A. An economic analysis of copyright law. *The Journal of Legal Studies*, vol. 18, n. 2. Chicago: University of Chicago Press, 1989, p. 325-363.

human consciousness and personality.<sup>27</sup> Consequently, legal doctrines such as the requirement of “originality” in copyright law have consistently been interpreted as necessitating a human author who exercises independent skill, labor, and judgment.<sup>28</sup>

The initial tremors challenging this anthropocentric edifice were perhaps subtle, exemplified by unique, albeit marginal, cases such as the “monkey selfie” incident. In this widely publicized case, a crested macaque fortuitously captured self-portraits using a photographer's equipment. The ensuing legal debate, particularly the lawsuit filed by PETA on behalf of the macaque, Naruto, highlighted the stark limitations of existing copyright law, which ultimately reaffirmed that copyright protection does not extend to works created by non-human animals.<sup>29</sup> While the courts dismissed the claim for animal authorship, the case served as a conspicuous, if somewhat whimsical, illustration of how non-human agency could generate outputs that, were they produced by a human, might readily qualify for copyright protection. It underscored the legal system's unpreparedness to decouple authorship from human identity, even in instances of simple, unintentional creation.

However, the challenge posed by sophisticated AI systems transcends these earlier, simpler instances of non-human generation by orders of magnitude. Modern AI, particularly generative AI models, are now capable of producing complex and often indistinguishable outputs across diverse creative fields, including literature, visual arts, music, and even scientific inventions.<sup>30</sup> These systems, trained on vast datasets of human-created works, can generate novel text, imagery, and code that exhibit hallmarks traditionally associated with human creativity, such as coherence, aesthetic appeal, and functional utility. This development precipitates a profound conundrum for IP law: if a work is generated predominantly or entirely by an AI, who, if anyone, is the author or inventor? Is it the AI itself, its developers, the user who provides a prompt, or does the work fall immediately into the public domain?

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<sup>27</sup> JASZI, Peter. Toward a theory of copyright: the metamorphoses of “authorship”. In: WILF, Steven (Org.). *Intellectual Property Law and History*. London: Routledge, 2017, p. 61-108.

<sup>28</sup> UNITED STATES SUPREME COURT. *Feist Publications, Inc. v. Rural Telephone Service Co.*, 499 U.S. 340, j. 27.03.1991.

<sup>29</sup> UNITED STATES COURT OF APPEALS FOR THE NINTH CIRCUIT. *Naruto v. Slater*, 888 F.3d 418, j. 23.04.2018.

<sup>30</sup> VINCENT, James. The scary truth about AI copyright is nobody knows what will happen next. *The Verge*. New York: Vox Media, 2023. See also OPENAI. *GPT-4 technical report*. Ithaca: arXiv, 2023; HAEFNER, Naomi, et al. Artificial intelligence and innovation management: a review, framework, and research agenda. *Technological Forecasting and Social Change*, vol. 162. Amsterdam: Elsevier, 2021, p. 120392; FURMAN, Jeffrey L.; NAGLER, Markus; WATZINGER, Martin. Disclosure and subsequent innovation: evidence from the patent depository library program. *American Economic Journal: Economic Policy*, vol. 13, n. 4. Nashville: American Economic Association, 2021, p. 239-270.

The implications of this AI-driven creative capacity are far-reaching and strike at the core of IP's incentive structures.<sup>31</sup> If AI can produce creative works or patentable inventions with minimal human intervention, the traditional justification of incentivizing human creators becomes diluted.<sup>32</sup> Furthermore, questions of ownership become intensely problematic. Granting authorship or inventorship to an AI, a non-legal entity lacking personhood, is currently incompatible with most legal systems.<sup>33</sup> Attributing ownership to the AI's developers or users also presents difficulties, particularly in determining the requisite level of human creative input necessary to qualify for IP protection when the AI performs the substantial generative work.<sup>34</sup> This legal gap risks creating a “negative space” where valuable creations may lack clear IP status, potentially disincentivizing investment in AI-driven innovation or, conversely, leading to an over-appropriation of AI-generated content under existing, ill-fitting legal frameworks.<sup>35</sup>

As a preliminary conclusion, the rise of posthuman intellects and their burgeoning capacity for autonomy, decision-making, and the creation of hyperrealities presents a watershed moment for intellectual property law. The cinematic warnings of machines achieving sentience, while dramatic, echo the real-world challenges of grappling with non-human creativity. Navigating this new terrain requires more than just tweaking existing legal doctrines; it demands a fundamental reconsideration of what it means to create, who (or what) can be recognized as a creator, and how the fruits of both human and artificial intellect should be protected and disseminated in an increasingly complex technological landscape. Failure to proactively address these issues risks stifling innovation, undermining the value of human creativity, and leaving society unprepared for the profound legal and ethical questions posed by the algorithmic muse. The challenge lies in fostering an IP framework that can embrace the potential of AI while safeguarding the core principles of fairness, attribution, and the enduring significance of human ingenuity.

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<sup>31</sup> BAYERN, Shawn. Reverse engineering (by) artificial intelligence. In: ABBOTT, Ryan (Org.). *Research handbook on intellectual property and artificial intelligence*. Cheltenham: Edward Elgar Publishing, 2022, p. 391-404. See also CUNTZ, Alexander, et al. *IP assets and film finance: a primer on standard practices in the US: Economic Research Working Paper No. 74*. Geneva: WIPO, 2023; HILTY, Reto; HOFFMANN, Jörg; SCHEUERER, Stefan. *Intellectual property justification for artificial intelligence*. Munique: Max Planck Institute for Innovation and Competition, 2020. (Research Paper No. 20-02).

<sup>32</sup> WORLD INTELLECTUAL PROPERTY ORGANIZATION. *AI inventions factsheet*. Geneva: WIPO.

<sup>33</sup> U.S. COPYRIGHT OFFICE. *Copyright Registration Guidance: Works Containing Material Generated by Artificial Intelligence*. Washington: U.S. Copyright Office, 2023.

<sup>34</sup> UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA. *Thaler v. Perlmutter*, 659 F. Supp. 3d 34, j. 18.08.2023.

<sup>35</sup> PICHT, Peter Georg; BRUNNER, Valerie; SCHMID, Rena. *Artificial Intelligence and Intellectual Property Law: From Diagnosis to Action*. Munique: Max Planck Institute for Innovation and Competition, 2022. (Research Paper No. 22-08). See also BRYNJOLFSSON, Erik; LI, Danielle; RAYMOND, Lindsey. *Generative AI at work. The Quarterly Journal of Economics*, vol. 140, n. 2. Oxford: Oxford University Press, 2025, p. 889-942; EBRAHIM, Tabrez Y. *Artificial intelligence inventions & patent disclosure. Penn State Law Review*, vol. 125. University Park: Penn State Law, 2020, p. 147-206.

A second preliminary conclusion allows us to state that the emergence of creative non-human agents, from serendipitous animal photographers to sophisticated generative AI, is not merely a peripheral concern but represents a fundamental, existential challenge to the anthropocentric premises of intellectual property law. The historical linkage between IP rights and human creativity is being systematically tested, forcing a re-examination of concepts like authorship, originality, and the very purpose of IP protection in an era where human intellect is no longer the sole progenitor of novel works. Navigating this evolving landscape will require profound legal and philosophical introspection. Legal systems worldwide must grapple with whether to adapt existing doctrines, develop *sui generis* rights for AI-generated works, or expand the public domain, all while balancing the goals of fostering innovation with ensuring equitable access and societal benefit. Failure to address these issues proactively risks rendering IP law increasingly anachronistic in a technologically advancing world.

## 5. Conclusions

The “monkey selfie” case involving Naruto and the creations attributed to DABUS, while differing in the nature of the non-human agent (animal versus artificial intelligence), critically converge on one point: they both expose the inherent limitations and inflexibility of an IP system conceived when creativity and invention were considered exclusive human monopolies. Although the Naruto case was resolved within existing legal parameters by reaffirming the necessity of human authorship, the exponential advancement of artificial intelligence – particularly generative AI – transforms the issues raised by DABUS into a matter of pressing contemporary concern and profound future significance.

Systematically denying the possibility that AI could, at some juncture, achieve a degree of creative or inventive autonomy, warranting some form of IP recognition may lead to unintended consequences. It could disincentivize investment in highly creative AI if no clear framework exists for the ownership of its outputs. Furthermore, if an AI can genuinely generate works or inventions without substantial human contribution qualifying as authorship or inventorship, to whom would the rights accrue? The programmer, the user, the AI's owner, or should such creations transition directly into the public domain?

The current stance of IP offices and courts, while legally sound under existing statutes, appears to be a temporary solution to a problem that intensifies daily. Technology is

advancing at a velocity that outpaces the adaptive capacity of legal frameworks. This is no longer a matter of futuristic speculation but a present reality where AI systems like GPT-4, Midjourney, and DALL-E generate text, images, and code that, in many instances, are indistinguishable from, or even surpass, human creations in complexity and perceived originality.

Consequently, initiating a profound, multidisciplinary, and international debate is imperative and urgent.<sup>36</sup> This debate must address whether machines or artificial intelligence can, and under what conditions should, be recognized as subjects of intellectual property rights, or whether the creation of a novel *sui generis* regime for AI-generated works and inventions is required. Such a discussion must involve jurists, technologists, philosophers, economists, and society at large. It will need to tackle not only the definitions of “author” and “inventor” but also the fundamental purposes of intellectual property: Are we seeking solely to incentivize human creativity, or also the generation of useful and novel works, irrespective of their origin? How would the rights of human creators be balanced against those of AI entities or their proprietors? What ethical and societal implications would arise from granting rights to non-human entities?

To circumvent this discussion is to risk rendering the law obsolete, incapable of adequately regulating a new era of creation and innovation. The *Naruto* and *DABUS* cases are not mere legal anecdotes; they are harbingers of a paradigm shift demanding a courageous and visionary reconsideration of the very foundations of intellectual property. The boundary between human and machine-driven creation is becoming increasingly indistinct, necessitating the formulation of new conceptual and legal frameworks to navigate this emergent terrain.

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