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Rise of Artificial Intelligence and Copyright Challenges

- Vishnu S.[1]

Abstract

The rise of artificial intelligence (AI) is having a profound impact on the world of intellectual property (IP), including copyright, patents, and trademarks. This article explores the copyright dilemma surrounding AI-generated works, analysing the challenges that arise when trying to determine ownership and protect these works under current copyright law. It will also discuss potential solutions to this dilemma, and the broader implications for copyright law and the creative industries. Finally, it will examine how AI is impacting other areas of IP law, including patents and trademarks, and the need to develop new legal frameworks and best practices to support innovation and creativity in the age of AI.

Keywords: *Artificial Intelligence, Copyright, Creativity, Authorship*

Introduction

The rise of artificial intelligence (AI) has sparked a revolution in the creative industries, enabling machines to generate music, art, and literature that rivals the work of human creators. While this technological advancement has opened up exciting new possibilities for creativity, it has also given rise to a thorny copyright dilemma[2]: who owns the rights to AI-generated works? Under current copyright law, the concept of *"authorship"* and *"originality"* are deeply rooted in the human experience, which makes it difficult to determine who the true *"creator"* of an AI-generated work is[3]. This challenge has implications for artists, publishers, and copyright holders alike, as they grapple with issues of ownership, attribution, and infringement. This article will explore the intersection of AI and copyright law, discussing the challenges and opportunities presented by the rise of AI-generated works in the creative industries.

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[2] Enrico Bonadio, and Luke McDonagh, 'Artificial intelligence as producer and consumer of copyright works: evaluating the consequences of algorithmic creativity.' (2020) IPQ 112.

[3] Atilla Kasap. 'Copyright and Creative Artificial Intelligence (AI) Systems: A Twenty-First Century Approach to Authorship of AI-Generated Works in the United States.' (2018) *Wake Forest J. Bus. & Intell. Prop* 335.

What is AI?

AI is a swiftly expanding area in computer science, focused on producing machines capable of thinking, learning, and decision-making similar to humans. The objective of AI is to create intelligent machines that can execute tasks that typically necessitate human intellect and decision-making[4]. AI systems are based on complex algorithms and statistical models that enable them to analyze large amounts of data and learn from their experiences. These systems can be trained to recognize patterns and make predictions based on past experiences, and they can adapt their behaviour over time to improve their performance[5].

Some of the key applications of AI include computer vision, natural language processing, and machine learning[6]. Machines possess the capability to interpret and comprehend visual information from their surroundings, like images and videos, which is referred to as computer vision. Machines' ability to comprehend and decipher human language, both spoken and written, is referred to as natural language processing. Machine learning is a branch of AI that concentrates on creating algorithms that can learn and enhance their performance through experience without explicit programming[7]. AI is a rapidly advancing field that has the potential to transform many industries and aspects of daily life. As AI systems continue to improve and become more sophisticated, they are likely to play an increasingly important role in our society.

The field of creative AI has made significant advancements in recent years, allowing AI systems to create original works of music, art, and literature that are both innovative and aesthetically pleasing[8]. In the

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[4] Miriam C Buiten. "Towards intelligent regulation of artificial intelligence." (2019) 10 EJRR 41.
[5] Miao Cui, and David Y. Zhang. "Artificial intelligence and computational pathology." (2021) 101 4 LI 412.
[6] Ivano Lauriola, Alberto Lavelli, and Fabio Aiolli. "An introduction to deep learning in natural language processing: Models, techniques, and tools." (2022) Neurocomputing 470, 443.
[7] Hamed Nozari, and Mohammad Ebrahim Sadeghi. "Artificial intelligence and Machine Learning for Real-world problems (A survey)." (2021) 1.3 IJIE 38.
[8] Melissa Avdeeff. "Artificial intelligence & popular music: SKYGGE, flow machines, and the audio uncanny valley." (2019) 8 MDPI.

field of music, AI algorithms can analyze vast amounts of existing music to identify patterns and generate new compositions that sound like they were created by human composers. To achieve this, AI models are trained on large datasets of existing music, which may include genres such as classical, jazz, or pop music[9]. The system can then use this data to learn the rules of music theory, such as chord progressions, harmonies, and rhythms. The AI model can then apply these rules to generate new music that is both novel and musically coherent.

Similarly, in the field of art, AI algorithms can analyze large databases of images to identify patterns and generate new works of art that mimic the style of human artists[10]. This can include everything from abstract paintings to photorealistic portraits. In the field of literature, AI algorithms can analyze vast quantities of text to generate new works of fiction, poetry, and even news articles[11]. These works can be indistinguishable from those created by human authors, making it difficult to determine who the true *"creator"* of the work is[12]. Overall, AI has the potential to transform the creative industries, enabling machines to generate original works that rival those created by humans. However, this also raises important questions about copyright law and who has the right to claim ownership of these works.

Copyright Dilemma

The rise of AI-generated works has indeed opened up exciting new possibilities for creativity, but it has also raised important legal questions around copyright ownership. One of the biggest challenges in protecting AI-generated works under current copyright law is determining ownership. Copyright law is based on the notion of authorship, which

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[9] Carlos Hernandez-Olivan, and Jose R. Beltran. "Music composition with deep learning: A review." *Advances in Speech and Music Technology: Computational Aspects and Applications* (2022) 25.
[10] Iria Santos, et al. "Artificial neural networks and deep learning in the visual arts: A review." (2021) NCA 121.
[11] Lise Jaillant, and Annalina Caputo. "Unlocking digital archives: cross-disciplinary perspectives on AI and born-digital data." (2022) AI & Society 823.
[12] Heidi Härkönen. "Fashion piracy and artificial intelligence—does the new creative environment come with new copyright issues?" (2020) JIPLP 163.

assumes that creative works are created by human beings who have a unique perspective and creative vision[13]. This means that only humans can own copyright in their works, and they have the right to control how their works are used and distributed[14]. However, in the case of AI-generated works, it is difficult to determine who the true *"creator"* of the work is, and therefore who should own the copyright.

Some argue that the creators of AI-generated works should be the individuals or organizations that developed the AI algorithms used to create the work[15]. Others argue that the creators should be the individuals or organizations that trained the AI models, or the individuals or organizations that provided the data on which the AI models were trained[16]. However, these arguments are not without controversy. Some believe that the true creators of AI-generated works are the AI systems themselves, and that these systems should be granted some form of legal personhood or recognition as independent entities[17]. Others argue that AI-generated works should not be protected by copyright at all, as they lack the creative intent and authorship that are central to copyright law.[18]

Given the complexity of these issues, it is likely that copyright law will need to be updated in order to provide clear guidelines for the ownership and protection of AI-generated works.[19] Until then, the legal status of these works remains uncertain, leaving both creators and consumers of AI-generated content in a difficult position. In addition to the challenges related to authorship and originality, protecting AI-generated works under copyright law also raises questions around

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[13] Vishnu S Warrier. "Public Interest Issues in Copyright." (2018) *TLW-OLJ* 97.
[14] Gabriel Axel Montes, and Ben Goertzel. "Distributed, decentralized, and democratized artificial intelligence." (2019) 141 TFSC 354.
[15] Jun He. "The Characteristics and Legislative Thinking of AI Painting Tort." (2023) IJEH 59.
[16] Brady D Lund., et al. "ChatGPT and a new academic reality: Artificial Intelligence-written research papers and the ethics of the large language models in scholarly publishing." (2023) JAIST 570.
[17] Simon Chesterman. "Artificial intelligence and the limits of legal personality." (2020) ICLQ 819
[18] Patrick Zurth. "Artificial Creativity? A Case Against Copyright Protection for AI-Generated Works." (2020) 25 UCLA JL & Tech.
[19] Dimple Jodha, and Poonam Bera. "Copyright Issues in the Era of Ai-A Critical Analysis." (2023) Resmilitaris 1737.

infringement.[20] If an AI system generates a work that is similar to an existing work, it can be difficult to determine whether this constitutes infringement or whether it is simply a case of convergent creativity.[21] Similarly, if an AI-generated work is used in a commercial context, it can be difficult to determine whether this constitutes fair use or whether it infringes on the rights of the copyright holder.[22]

This issue of infringement is particularly relevant in industries such as music, where AI systems can generate works that sound similar to existing songs or compositions[23]. In some cases, this can lead to legal disputes, as copyright holders may argue that their intellectual property has been infringed upon. However, it can be difficult to determine whether an AI-generated work is truly a copy of an existing work or whether it simply shares similarities due to the nature of the data and algorithms used to generate it. To address these challenges, there have been a number of proposals for new approaches to copyright law that would better accommodate AI-generated works. One proposal is to create a new category of *"machine authorship"* that would grant legal recognition to AI-generated works.[24] This would require a rethinking of the concept of authorship, as it would recognize the role of algorithms and data in the creative process.

Another proposal is to take a more collaborative approach, where AI systems work in partnership with human creators to generate new works.[25] This could involve using AI to assist human creators in the

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[20] Enrico Bonadio, Plamen Dinev, and Luke McDonagh. "Can artificial intelligence infringe copyright? Some reflections." (2022) *Research Handbook on Intellectual Property and Artificial Intelligence*. Edward Elgar Publishing 245.

[21] Niloufer Selvadurai, and Rita Matulionyte. "Reconsidering creativity: copyright protection for works generated using artificial intelligence." (2020) JIPLP 536.

[22]Yang Gao, Paul Kossof, and Yan Dong. "Research on the Dilemma and Improvement of the Copyright Fair Use Doctrine Related to Machine Learning in China" (2022) 22 UIC Rev. Intell. Prop. L. 1.

[23] Nana Wang, et al. "The algorithmic composition for music copyright protection under deep learning and blockchain." (2021) ASC 107763.

[24] Wenqing Zhao. "AI Art, Machine Authorship, and Copyright Laws." (2020) Am. U. Intell. Prop. Brief 1.

[25] Polyxeni Vassilakopoulou, et al. "Developing human/AI interactions for chat-based customer services: lessons learned from the Norwegian government." (2023) EJIS 10.

creative process, or developing new legal frameworks that recognize the joint authorship of AI and human creators. However, there is still much debate and uncertainty about the best way to protect AI-generated works under current copyright law. As AI continues to transform creative industries, it is likely that these issues will become even more complex and contentious. Ultimately, finding a way to protect rights of creators and ensure fair compensation for their work, while also fostering innovation and creativity, will require a careful balancing of competing interests and a willingness to adapt to the rapidly changing technological landscape.

Potential Solutions

There have been a number of proposed solutions to the copyright dilemma surrounding AI-generated works. One potential solution is to create a new category of *"machine authorship"* that would grant legal recognition to AI-generated works[26]. They argue that treating AI-generated works as if they were created by human authors would allow for a more flexible and adaptable approach to copyright law that can keep up with the rapid pace of technological change. This approach would involve updating copyright law to explicitly recognize that AI systems can be considered *"authors"* in their own right, and that they can hold copyright in the works they generate. Opponents of this proposal argue that it would undermine the fundamental principles of copyright law, which are based on the idea of human creativity and authorship.[27]

They argue that AI-generated works lack the personal touch and subjective creativity that human authors bring to their works.[28] They also raise concerns about the potential for abuse of the system, such as the possibility of malicious actors using AI to flood the market with low-quality works that claim copyright protection.[29] Expanding on the

[26] Paarth Naithani. "Issues of authorship and ownership in work created by artificial intelligence-Indian copyright law perspective." (2022) 11 NTUT JIPRM 1.
[27] Yang Xiao. "Decoding Authorship: Is There Really no Place for an Algorithmic Author Under Copyright Law?" (2023) IIC-IRIPCL 5.
[28] Vincenzo Iaia. "To Be, or Not to Be… Original Under Copyright Law, That Is (One of) the Main Questions Concerning AI-Produced Works." (2022) GRUR International 793.
[29] Andreas L Opdahl., et al. "Trustworthy journalism through AI." (2023) DKE 102182.

potential solution of updating copyright law to address AI-generated works, there are several ways in which this could be achieved. One approach would be to define new criteria for originality that take into account the unique nature of AI-generated works[30]. For example, copyright law could be amended to consider the level of human input involved in the creation of the work, the complexity of the AI system used, and the degree of originality and creativity demonstrated by the work. Another potential approach is to create a new framework for determining ownership of AI-generated works.[31] This would require a departure from the traditional notion of authorship in copyright law, which is based on the idea of a single human creator. Instead, ownership of AI-generated works could be assigned based on a collaborative model that reflects the role of both humans and machines in the creative process.[32] This could involve assigning ownership to the human creators of the AI system, the organization that developed the AI system, or even the AI system itself.

However, any such changes to copyright law would need to be carefully balanced against the need to protect the rights of creators and copyright holders. This would require a thorough examination of the economic, social, and cultural implications of AI-generated works, as well as a consideration of the potential impact on innovation and creativity in the field[33]. Ultimately, the solution to the copyright dilemma surrounding AI-generated works will require a collaborative effort between legal experts, policymakers, industry professionals, and creators themselves. By working together to develop new frameworks and best practices that support innovation and creativity, while also protecting the rights of all stakeholders, we can ensure that the benefits of AI are realized in a way that is fair and equitable for all.

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[30] *Supra.* Note 20.

[31] Akanksha Bisoyi. "Ownership, liability, patentability, and creativity issues in artificial intelligence." (2022) ISJ 377.

[32] Paul Fyfe. "How to cheat on your final paper: Assigning AI for student writing." (2022) AI & SOCIETY 1.

[33] Partha Pratim Ray. "ChatGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope." (2023) ITCPS.

Implications for Copyright Law and Creative Industries

The potential solutions to the copyright dilemma surrounding AI-generated works have significant implications for both copyright law and the creative industries. One of the key areas that would be impacted by these solutions is licensing.[34] If AI systems are recognized as authors and given copyright protection, this would require the development of new licensing frameworks that enable creators to obtain the necessary rights to use and distribute these works.[35] This could involve the creation of new licensing platforms that enable creators to easily obtain licenses for AI-generated works, or the development of new legal frameworks that govern the use of these works. Another area that would be impacted by these solutions is royalties. If AI systems are granted copyright protection, they would also be entitled to royalties for the use of their works[36]. This would require the development of new royalty distribution systems that take into account the contributions of both human creators and AI systems. This could involve the creation of new systems for tracking the use of AI-generated works, or the development of new royalty models that recognize the unique contributions of AI systems.

A third area that would be impacted by these solutions is attribution.[37] If AI systems are recognized as authors, this would require the development of new attribution systems that enable creators to clearly identify the contributions of both human creators and AI systems.[38] This could involve the creation of new metadata standards that enable creators to easily identify the contributions of different creators, or the

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[34] David Mhlanga. "Artificial intelligence in the industry 4.0, and its impact on poverty, innovation, infrastructure development, and the sustainable development goals: Lessons from emerging economies?" (2021) Sustainability 5788.

[35] Victoria C Stodden. "Enabling Reproducible Research: Open Licensing for Scientific Innovation." (2009) 1.

[36] Martin Miernicki, and Irene Ng. "Artificial intelligence and moral rights." (2021) AI & SOCIETY 319.

[37] Filippo Santoni de Sio, and Giulio Mecacci. "Four responsibility gaps with artificial intelligence: Why they matter and how to address them." (2021) P&T 1057.

[38] Luciano Cavalcante Siebert, et al. "Meaningful human control: Actionable properties for AI system development." (2023) AI and Ethics 241.

development of new attribution models that recognize the unique contributions of AI systems.

Overall, the potential solutions to the copyright dilemma surrounding AI-generated works have significant implications for copyright law and creative industries. While there is still much debate and uncertainty about the best way to address this challenge, it is clear that any solution will require a careful balancing of competing interests, including the rights of creators, the interests of copyright holders, and the need to foster innovation and creativity in the field of AI-generated works. As AI continues to transform creative industries, it will be essential for copyright law to adapt to meet the changing needs of this rapidly evolving field.

Broader Implications for Intellectual Property

The rise of AI is having a significant impact on IP law, not just with regards to copyright as we have discussed, but also in relation to patents and trademarks[39]. AI is having a significant impact on the field of patents, which is one of the major areas of intellectual property law. AI has the potential to streamline and enhance various aspects of the patent process, including patent search, examination, and prosecution.[40] For example, AI-powered search tools can help patent examiners quickly identify prior art and evaluate patentability, while machine learning algorithms can be used to predict patient outcomes and analyze patent portfolios. At the same time, AI is also raising new challenges and concerns in the field of patents. One major concern is the issue of inventorship and ownership of AI-generated inventions.

Unlike copyright law, which focuses on authorship, patent law is based on the concept of inventorship, which requires that the inventor(s)

[39] Woodrow Barfield, Argyro Karanasiou, and Karni Chagnal-Feferkorn. "Considering intellectual property law for embodied forms of artificial intelligence." (2022) Research Handbook on Intellectual Property and Artificial Intelligence, Edward Elgar Publishing 40.
[40] Jieun Kim, et al. "Legal Technologies in Action." (2021) Patent Analytics: Transforming IP Strategy into Intelligence 187.

be identified and named in the patent application.[41] However, in cases where AI plays a significant role in the inventive process, it may be difficult to determine who should be considered the inventor.[42] Another concern is the potential for bias and discrimination in AI-powered patent analysis. For example, if an AI system is trained on historical patent data that reflects biases or inequalities in the patent system, it may perpetuate those biases in its analysis of new patent applications. This could lead to unfair or inequitable outcomes for certain inventors or industries.

To address these challenges, there is a need to develop new legal frameworks and best practices that reflect unique nature of AI-generated inventions and ensure that the patent system remains fair, equitable, and accessible to all. This may involve updating patent law to include more explicit provisions for AI-generated inventions, or developing new guidelines and standards for evaluating the inventiveness and novelty of AI-generated inventions. Ultimately, the successful integration of AI into the patent system will require a collaborative effort between legal experts, policymakers, industry professionals, and inventors themselves.

The rise of AI is not only impacting copyright and patents, but also has significant implications for trademarks. Trademarks are an essential component of brand identity and play a critical role in distinguishing one brand from another in the marketplace.[43] With the increasing use of AI in various aspects of business operations, from product development to marketing, there are several ways in which AI is impacting trademark law. One significant area of impact is in the development and management of trademarks. AI-powered tools can analyze large volumes of data, including social media, customer reviews, and other online content, to identify trends, monitor brand reputation,

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41 Vishnu S. Warrier, and S. Harikrishnan. "The Macro-Economic Impact of the Patent System." (2014) JSS JLR.

42 Daria Kim. "'AI-Generated Inventions': Time to Get the Record Straight?" (2020) *GRUR International* 443.

43 Susan P Douglas., C. Samuel Craig, and Edwin J. Nijssen. "Executive insights: Integrating branding strategy across markets: Building international brand architecture." (2001) JIM 97.

and identify potential trademark infringements.[44] This can help companies to better protect their trademarks and respond quickly to potential threats.

Another way in which AI is impacting trademarks is through the use of automated trademark registration systems.[45] Many countries have implemented or are considering implementing AI-powered trademark registration systems that use algorithms to evaluate applications and identify potential conflicts with existing trademarks. This can help to streamline the trademark registration process and reduce the backlog of applications, while also improving accuracy and consistency of trademark evaluations.[46] However, there are also potential risks associated with the use of AI in trademark law. One concern is the potential for AI-generated trademarks to inadvertently infringe on existing trademarks or to be too similar to existing marks, leading to confusion among consumers.[47]

Additionally, there is a risk that AI-powered tools could be used to engage in bad faith trademark registrations or to artificially manipulate trademark searches to favour certain applicants.[48] Developing new legal frameworks and best practices is crucial to tackle these risks and reflect the distinctive challenges and prospects presented by AI in trademark law. This will require a collaborative effort between legal experts, policymakers, industry professionals, and other stakeholders to ensure that the benefits of AI are realized in a way that is fair, equitable, and supportive of innovation and creativity in the field of trademarks.[49]

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[44] Francesca Lagioia, et al. "AI in search of unfairness in consumer contracts: the terms of service landscape" (2022) JCP 481.
[45] Lee Curtis, and Rachel Platts. "AI is coming and it will change trade mark law." (2017) MIP 9.
[46] Althaf Marsoof, Kanchana Kariyawasam, and Chamila Talagala. "Way Forward: Reframing Intellectual Property Law in Sri Lanka: Lessons from the Developing World and Beyond. Singapore" (2022) SNS 285.
[47] Mariela de Amstalden, and Burkhard Schafer. "When Brand Distinctiveness Is in the AI of the Beholder: Trademark Law for Autonomous Intelligent Shopping Agents." (2022) NZYIL.
[48] Daryl Lim. "Computational trademark infringement and adjudication." (2022) Research Handbook on Intellectual Property and Artificial Intelligence. Edward Elgar Publishing 259.
[49] Aihui Chen, Yaobin Lu, and Yeming Gong. "Higher Price: A Benefit of Online Value Co-Creation Activities in Sponsored Communities." (2022) I&M 103703.

The rise of AI is rapidly transforming the field of intellectual property, including patents and trademarks. While AI is offering numerous benefits in terms of streamlining processes, increasing efficiency, and promoting innovation, it is also posing significant challenges to the traditional legal frameworks that govern these fields. The development of AI-generated works and the use of AI in trademark development and management are just a few examples of the complex issues arising in this rapidly evolving field. As AI continues to evolve, it will be crucial to develop new legal frameworks and best practices that can effectively address the challenges posed by AI-generated works and automated trademark registration systems. This will require a collaborative effort between legal experts, policymakers, industry professionals, and other stakeholders to ensure that the benefits of AI are realized in a way that is fair, equitable, and supportive of innovation and creativity in the field of intellectual property. By working together to address these challenges, we can help to ensure that the full potential of AI is realized in a way that benefits society as a whole.

Conclusion

The rise of artificial intelligence is having a profound impact on the world of intellectual property. As AI systems become more advanced and more commonly used in creative fields such as music, art, and literature, there is growing concern about how these works should be protected under copyright law. The copyright dilemma surrounding AI-generated works raises important questions about authorship, originality, and infringement, and there is ongoing debate about how best to address these issues. At the same time, the impact of AI extends beyond copyright to other areas of intellectual property, such as patents and trademarks. As AI systems are used more frequently in the development of new technologies and products, there is a need to rethink the legal frameworks that govern these areas of IP law.

To navigate these challenges, it will be essential for policymakers, legal experts, and industry professionals to work together to develop new solutions and best practices that can support innovation and creativity in the age of AI. This will require a careful balancing of competing interests, including the rights of creators, the interests of copyright holders, and the need to foster innovation and economic growth. Ultimately, the rise of AI presents both challenges and opportunities for the world of intellectual property. By working together to find new solutions and legal frameworks that can support creativity and innovation, we can ensure that the benefits of AI are realized in a way that is fair, just, and equitable for all.