

# COPYRIGHT IN THE AGE OF ARTIFICIAL INTELLIGENCE: UNRAVELLING THE COMPLEXITIES FOR THE PROTECTION OF AI-GENERATED WORK

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## ABSTRACT

*The rise of artificial intelligence (AI) as a creative tool disrupts the traditional realm of copyright law. This work explores the complexities of copyright protection for AI-generated works. We examine the concept of authorship, a cornerstone of copyright, and its applicability to AI. Ownership of AI creations will be analyzed, considering the programmer's role and the training data's influence. Furthermore, using copyrighted material in AI training raises questions about fair use and infringement. By unraveling these issues, this work seeks to illuminate the path toward a copyright framework that fosters innovation while safeguarding the rights of creators and AI developers in the age of AI.*

**Keywords** - Artificial Intelligence, copyright, authorship, copyright protection

## 1. INTRODUCTION

Copyright law, traditionally designed to protect the fruits of human creativity, faces a new challenge in the age of artificial intelligence (AI). AI is no longer relegated to mundane tasks; it's capable of generating creative outputs like music, art, and even literature. This begs a critical question: how do copyright principles adapt to this innovative landscape?

Let's begin by revisiting the core tenets of copyright. At its heart, copyright protects original works fixed in any tangible medium. So, as long as the work is 'original' and 'fixed' nearly any type of work can qualify for copyright protection. Originality refers to a work's unique expression, not necessarily the underlying idea. According to United States Supreme Court, originality means author's "independently created work" with "minimal degree of creativity". Copyright protects specific subject matter, like literary works, music, or visual arts. Authorship, traditionally reserved for humans, becomes a central issue when AI enters the picture.

Computer-generated works have existed for some time, but AI raises the bar in terms of creativity. The question then

becomes: who or what owns the copyright for these AI-generated creations? Is it the programmer who built the AI, or the AI itself? The "labour theory" of copyright suggests protection should be awarded based on the creator's effort. Is AI simply a tool, or can it be considered a creative force?

Further complexities arise when we consider the data used to train AI models. If copyrighted material is used, does it constitute fair use or copyright infringement? This becomes even more nuanced when the AI itself generates content that bears a resemblance to copyrighted works.

Granting copyright protection to AI raises additional concerns. Who will be held liable for infringement of AI-generated works – the programmer, the user, or the AI itself?

This paper sets the stage for exploring these intricate questions. By unraveling the complexities at the intersection of copyright and AI, we can work towards a framework that fosters innovation while ensuring proper protection for both human creators and AI developers.

## 2. THE CONCEPT OF COPYRIGHT

Copyright acts as a shield for creative works, giving the creator control over how their work is used. This legal concept, rooted in intellectual property law, grants the owner exclusive rights. In simpler terms, the owner gets to decide how their creation – a song, a painting, a book – can be shared or used by others. Copyright safeguards the way ideas and information are expressed in a tangible form, like being written down, recorded as music, or captured as an image. However, it's important to remember that copyright doesn't protect the raw ideas themselves, but rather the unique way they are brought to life. Copyright protects original works, but what exactly makes a work "original"? The work must be your creation, not a copy of someone else's. There needs to be a minimal level of creativity, a "spark" as the Supreme Court puts it. This doesn't require a groundbreaking masterpiece, but there should be some originality in how you express yourself.

Copyright safeguards a broad range of creative expressions. This includes the written word (novels, poems, articles, etc.), plays and dramatic works (scripts, choreography, etc.), musical compositions, and artistic creations (paintings, photographs, sculptures, and more). It even extends to films and sound recordings.

In India, computer software and databases are also protected under literary work. Computer software (source code) is protected in the PDF format and original databases are protected. A database is essentially a collection of information that's organized and stored. While the Indian Copyright Act doesn't have a specific definition for "database" or "computer database," it does recognize compilations, which include databases, as a form of literary work and therefore subject to copyright protection. The European Commission Directive on Databases Copyright offers a broader definition of a database than what you might find in some national laws. The Directive defines a database as any collection of information, regardless of whether it's creative works, simple data, or other materials. The key aspect is that this information must be organized systematically, allowing for easy access electronically or through other means. This definition even includes the tools needed to navigate the database itself, such as indexes and thesauri.

The Indian Copyright Act assigns authorship based on the type of work created. For literary & dramatic works, the person who creates the work, like a writer or playwright, is considered the author. For musical works, the composer who writes the music holds authorship. For artistic works, the artist who creates the visual work, such as a painting or sculpture, is the author. For photographs, the photographer who takes the picture is considered the author. For films & sound recordings, the producer who oversees the creation is designated as the author. For computer-generated works, creative outputs produced by computers in the realm of literature, drama, music, or art, the law assigns authorship to the person who commissioned the work.

### **3. ARTIFICIAL INTELLIGENCE**

AI is a branch of computer science focused on developing machines that can mimic human intelligence. These machines can tackle problems and solve them in ways that traditionally require human intervention. AI can work independently or be combined with other technologies like sensors or robotics to achieve even more complex tasks.

Think of digital assistants on your phone, GPS navigation systems, or even self-driving cars – these are all real-world examples of AI at work. Machine learning and deep learning, often mentioned alongside AI, are subfields within computer science that deal with creating algorithms inspired by the human brain. These algorithms can "learn" from vast amounts of data, allowing them to improve their ability to categorize information or make predictions over time.

Most of the AI we encounter today falls under the category of weak AI, also known as narrow AI or artificial narrow intelligence (ANI). This type of AI is like a specialist, trained to excel at specific tasks. Narrow AI powers impressive applications like virtual assistants (Siri, Alexa), medical diagnostic tools (IBM Watson), and even self-driving cars.

On the other hand, strong AI is the realm of science fiction for now. It encompasses two theoretical concepts:

**Artificial General Intelligence (AGI):** Imagine a machine with human-level intelligence – capable of independent thought, problem-solving, learning, and planning for the future. This is AGI.

**Artificial Super Intelligence (ASI):** This takes things a step further, envisioning machines that surpass human intelligence altogether. Think HAL 9000 from "2001: A Space Odyssey" – that's the fictional realm of ASI.

While strong AI isn't a reality yet, researchers continue to explore its potential.

#### **3.1. Machine learning and deep learning**

Machine learning and deep learning are both subfields of AI, with deep learning being a more specialized branch of machine learning. Both leverage a technology called neural networks to learn from vast amounts of data. These neural networks are essentially computer programs inspired by the human brain's structure. They consist of interconnected layers that analyze data and make predictions based on what they find.

The key difference between machine learning and deep learning lies in the type of neural networks used and the level of human involvement. Traditional machine learning algorithms use simpler neural networks with fewer layers. These algorithms typically rely on supervised learning, where human experts pre-label and organize the data for the AI to learn from.

Deep learning takes things a step further by utilizing deep neural networks – structures with many more hidden layers compared to traditional machine learning models. This complexity allows deep learning to perform unsupervised learning. Here, the AI can analyze massive amounts of raw, unlabeled data to identify patterns and features on its own, without needing human intervention to categorize everything beforehand. In essence, deep learning unlocks the potential of machine learning by enabling it to process and learn from much larger and more complex datasets.

### **4. AI-GENERATED CONTENT**

AI-generated content encompasses various creative outputs – written text, videos, even computer code – produced by machines known as generative AI tools. These tools are trained on massive datasets, enabling them to craft relevant

content based on a simple prompt. So, you can provide a word, a phrase, a question, or any other kind of starting point, and the AI tool will use its knowledge to generate something new and original.

These works such as text, art, videos, computer code, etc are all subject of copyright. The crux of the copyright issue with AI-generated content lies in how these systems learn. Similar to other machine learning models, AI for creative tasks functions by uncovering and imitating patterns within data. This means that to create an original sentence or image, the AI must first be trained on existing works by humans. For instance, if an AI art generator produces art reminiscent of Georgia O'Keefe's style, it likely means it was trained on a dataset that included her artwork. Likewise, an AI content generator capable of writing in the style of Toni Morrison would need to be trained on a large corpus of her written works. This dependence on pre-existing creative works raises copyright concerns, as it blurs the lines between inspiration and potential infringement. There are many examples of works generated by AI. A few of them are mentioned below:

**The "Next Rembrandt":** In 2016, a bank collaborated with an ad agency to push the boundaries of technology and art. They used deep learning and facial recognition to create a 3D-printed painting in the style of Rembrandt – over 300 years after his death! The project involved a team of specialists who analyzed Rembrandt's existing works to capture details like brushstrokes and canvas textures.

**AI-Composed Music:** Sony's research lab developed software called Flow Machines that can create music by analyzing vast libraries of songs. The software can generate new compositions by blending elements from various tracks. Users simply choose a desired style or artist, and the software creates a unique piece. A human musician then adds lyrics and refines the arrangement.

**AI News Stories:** The Press Association (UK/Ireland) partnered with Google to experiment with AI-powered news reporting. The project aimed to generate localized news stories using AI.

**AI Co-Authored Novel:** In Japan, a short novel co-written with the help of an AI program made it through the initial screening for a national literary award. The project involved setting parameters and allowing the AI to "write" autonomously.

**AI-Generated Music and Poetry:** Google's DeepMind lab created WaveNet, a software that can compose music after being trained on existing recordings. Additionally, Google AI experimented with feeding large amounts of text data (including romance novels) to an AI and prompting it to write poems based on specific starting points.

OpenAI's GPT-2 language model is another example. It can generate realistic-looking news articles or stories based on

user prompts, adapting content and style for a human-like quality.

These examples showcase the growing capabilities of AI in various creative fields, blurring the lines between human and machine creation.

## **5. PROTECTION OF AI-GENERATED CONTENT UNDER COPYRIGHT**

Copyright law often relies on the Lockean labor theory, which states that people own the fruits of their labor. This theory suggests that ownership arises when someone mixes their labor with something from nature, creating something new.

This theory might not apply directly to AI-generated works because the Lockean theory emphasizes human labor. AI creations, however, result from programmed algorithms, not human emotions or feelings and because AI outputs are based on the data they're trained on and the specific prompts provided, they tend to be predictable and repetitive. This raises questions about originality, a key requirement for copyright protection.

In essence, the Lockean theory might need reinterpretation in the age of AI to determine if, and how, AI-generated content can be copyrighted.

Some people suggest that the data that is used to train the AI is already copyrighted data of other people and therefore the result is an infringement of the copyrighted material. But, even if we take humans, for example, the data collected by them compiling or arranging it in any original manner is a subject matter of copyright under the database category and there is a possibility that it is a copyrighted material of other people. Along similar lines, the output of the AI is also an arrangement of the data fed into it. Furthermore, humans also create work taking inspiration from others, similarly, we can say that AI has also taken inspiration from the data made available to it and with the help of machine learning has created a new work.

There is one more popular theory in copyright- Idea-Expression Dichotomy. Similar to human creativity, copyright law for AI-generated content protects the unique expression, not the underlying idea. Two AI systems could be trained on the same dataset and receive the same prompt, yet generate different creative outputs. Copyright protection would apply to the original way each AI system expresses the idea, not the idea itself.

Just as with human works, the core principle here is to safeguard the free flow of ideas. AI development thrives on access to a vast pool of information and creative concepts. Restricting ideas through copyright could hinder the advancement of AI technology. Copyright law should allow AI systems to be inspired by existing ideas and data, enabling them to build upon that foundation and generate new expressions. In essence, copyright protection should

focus on the unique creative output produced by AI, not the underlying ideas or data used in its creation.

With this, we can easily support the protection of AI-generated work under copyright but the major problem lies with the question that who will be protected for the work—the programmer, the user, or the AI itself?

### 5.1. India

As per the Copyright Act, 1957 of India, only the person can be the author/ owner of the work. Section 17 (b) of the Act also states that “*in the case of a photograph taken, or a painting or portrait drawn, or an engraving or a cinematograph film made, for valuable consideration at the instance of any person, such person shall, in the absence of any agreement to the contrary, be the first owner of the copyright therein*”. So, if a photograph is taken or a painting has been made by an AI, the owner will be the person on whose instance the work has been done by the AI. In such a case, the user of the AI tool can be considered as the owner.

Indian copyright law grants authorship of computer-generated creative works to the person who initiates their creation. This implies a human is still considered the driving force behind the AI, even if it plays a major role. While India’s 1957 Copyright Act doesn’t directly define “author” for artistic and literary works, section 2(d) provides a framework.

### 5.2. Outside India

Here’s a look at the different situations across various countries with how copyright law applies to the creative outputs of Artificial Intelligence:

Countries like Japan and Germany currently limit copyright protection to works with human-created “thoughts or sentiments.” AI-generated works, even with human intervention, might not qualify under this view.

China protects AI-generated works, but only if humans play a significant role in the creation process. This includes selecting data formats or setting parameters for the AI. A court case in China *Shenzhen Tencent v Shanghai Yingxun* sheds light on how AI-generated works are treated under copyright law. The court acknowledged that outputs from AI tools like Dreamwriter can be copyrighted. However, to claim copyright, the person claiming authorship (usually the AI’s owner) must still show the work has some level of intellectual creativity, as required by Chinese law.

The UK and the US don’t explicitly exclude AI-generated works. The UK considers the person who sets up the AI system as the “author.” In the US, copyright protection hinges on human authorship. The creator might be eligible for copyright if they use AI as a tool, but the AI itself cannot be an author. The US Copyright Office has even rejected claims where minimal human intervention was

involved. A unique case, *Naruto v. Slater*, explored whether an animal (a monkey in this instance) could own the copyright to a selfie it took. U.S. law doesn’t grant copyright to animals, so the court ruled that the photo belonged to the public domain, meaning anyone could use it freely.

Singapore’s copyright law is clear: authorship belongs to humans, not machines. This preference for human involvement was highlighted in a court case *Asia Pacific Publishing v Pioneers & Leaders*. The court established four key criteria for copyright protection. While the law didn’t initially specify who could be an author, the court ruled that copyright doesn’t extend to non-humans like machines. This aligns with the law’s original intent to grant rights only to natural persons, not companies, emphasizing the human element in creative work.

The European Union’s main copyright law, the recently updated Copyright Directive (2019), aims to modernize copyright rules across member states for the digital age. This includes acknowledging AI-generated works. The law grants copyright protection to original literary works, including those by AI, as long as they meet creativity standards. However, it doesn’t specify who owns the copyright for AI creations. In such cases, existing copyright laws likely apply, meaning ownership goes to the human who created the AI (the programmer, for instance).

Australia excludes machine-generated works entirely, while Taiwan considers them “community property” not eligible for copyright.

Given above it could be inferred that there’s no global consensus on copyright protection for AI works. Human contribution to the creative process plays a crucial role in many countries and the concept of AI as an independent author is not yet recognized in copyright law.

Protecting AI as an independent author is not a feasible idea as ultimately it needs to be supported by a legal person. For all legal-related matters, only a legal entity can fulfill the requirements therefore, even though the protection can be granted to the AI-generated work the author/owner of that work needs to be a legal entity only. The need is to now elaborate the legislations on the contents developed using the AI. This is a rapidly evolving area, and legal frameworks are likely to adapt as AI technology continues to advance.

## 6. KEY ISSUES

This paper has highlighted the intricate questions at the intersection of copyright and AI. By unraveling these complexities, we can work towards a framework that fosters innovation while ensuring proper protection for both human creators and AI developers.

This framework will likely need to address several key issues:

**Originality and Authorship:** Determining whether AI-generated works are eligible for copyright protection raises questions about the concept of originality and authorship. At the end of the day, no AI can truly capable of making something without the human intervention. But the level of intervention will make the question thornier. Copyright law gets murky when AI creates works with little human involvement. Who gets the credit? Is it the AI's developer, the person who ordered the work, or the AI itself? Existing copyright laws, designed for human creators, don't have clear answers for these situations. This lack of clear ownership can leave AI-generated works unprotected and creators unrecognized. Even though scholars have proposed a number of possible solution to such question, such as, joint authorship or work-for-hire-doctrine. But each of these has their own limitations and loopholes.

The ownership question ties directly into how AI-generated works can be used commercially. Without clear ownership rules, who profits from these creations? This uncertainty creates a roadblock for AI development and adoption. Creators and investors might hesitate to get involved in AI projects if legal protections and potential financial rewards are unclear.

Copyright law traditionally protects original works, meaning they must be independently created and show some level of creativity. This concept clashes with AI-generated works, which often stem from analyzing and recombining existing data. Legal frameworks built around human creators struggle to assess the originality of AI outputs. This ambiguity could leave AI-generated works unprotected and stifle creativity in the AI art world.

**Legal Status of AI:** The legal status of AI as an author and the capacity to hold copyright under the law is a contentious issue. Some argue that conferring copyright protection on AI-generated works is disputable due to the lack of human-like attributes such as fatigue and mortality in AI systems. The level of human involvement in AI-generated works significantly impacts current copyright considerations. Finding a balance between protecting human contribution and fostering innovation in AI creation will be crucial.

**Copyright Infringement:** Concerns arise regarding copyright infringement when AI-generated content is trained on protected intellectual property, leading to questions about the originality and uniqueness of the output. Copyright infringement in AI is a two-fold issue, first is on the training phase where large amounts of data are needed to train AI models, and this data can sometimes include copyrighted works. Current copyright laws don't always provide clear guidelines for this scenario and second is related to the output generated. AI models can create new outputs that raise copyright questions. Are these outputs too similar to the copyrighted material used for training, or sufficiently original creations?

**Duration and scope of copyright protection:** Copyright terms designed for human creations, lasting for decades, might not fit AI-generated works. The rapid production of AI content could lead to overly long monopolies, restricting access and innovation. How much protection should AI-generated works receive? What constitutes a significant part of the work? How are derivative works based on AI outputs judged? Can fair use exceptions be applied? These uncertainties require careful consideration to ensure copyright law remains adaptable to this new technology.

The last issue could be that currently, copyright protection for AI works varies greatly by country. This creates uncertainty and potential loopholes for exploitation.

## **7. WAY AHEAD**

In the existing legislation, only a person is considered an author in his own right. But, it's a need of the hour that laws must be redefined and the author should also include the legal entity so that the companies can register themselves as an author on behalf of the work generated by their AIs. At present, not only the humans are able to create a copyright work but AI is also playing an important role in generating the digital work that has been programmed. Therefore, there is a need for further regulations regarding the copyright over the work generated by AI. While many countries are still grappling with AI regulations, some have taken steps to acknowledge AI's legal existence. A notable example is Saudi Arabia granting citizenship to a robot named Sophia in Riyadh during 2017. Similarly, Japan established special regulations that same year, granting residency to a robot named Shibuya Mirai.

Work generated by AI, either with or without human intervention qualifies for copyright protection till it has all the essentials of copyright because a work has been created. AI, as a machine itself can not be protected for the work generated, it requires a person to represent it. That person could be an individual- programmer/user or a company that has collaboratively made the AI or has owned the AI. In such circumstances, the company as a legal entity can be protected for the work generated. While AI lacks the human capacity for empathy and morality, some argue it could be recognized as a legal entity with certain rights. This stems from AI's ability to perform actions traditionally requiring human intelligence. For instance, a company created a lawyer robot that listens to court arguments and generates responses for the defendant. This case highlights how AI can perform tasks that seem to necessitate human-like thinking.

A lawsuit against an AI image generator called "Stable Diffusion" raises important questions about copyright and AI art. The artists behind the lawsuit claim Stable Diffusion uses billions of copyrighted images, including theirs, to create new artwork without permission or compensation. They argue this hurts their livelihood and infringes on their artistic rights. This case (and others like it) highlight the need for new laws to address how AI interacts with creative

property. As AI technology continues to advance, it is crucial for society to navigate the legal and ethical dimensions of AI-generated works to ensure fair and appropriate protection for creators and their creations.

AI is trained on a dataset that could be already protected under copyright. But if the result or we can say the expression is original then it becomes the subject matter of copyright. The protection over the databases or the work created by arrangement is also based on the already existing copyrighted work. There is a need to develop specific guidelines and tests to assess whether the use of copyrighted material in training AI systems constitutes fair use or copyright infringement. Several countries are enacting laws to tackle potential copyright infringement during AI training. These laws often incorporate fair use exceptions or special allowances for Text and Data Mining (TDM). The European Union's Digital Single Market (DSM) Directive has sparked significant debate and research regarding these TDM exceptions and limitations. There is also a need to encourage collaboration between AI developers and copyright holders to establish licensing frameworks and permissions for the use of protected works in AI training.

At international level, the United Nations established the UNICRI Center for AI and Robotics in the Hague to spearhead research in the field. UNESCO, in November 2021, adopted a non-binding global agreement on the ethical development of AI, providing member states with shared values and principles. The Organization for Economic Co-Operation and Development (OECD) released recommendations for AI development in May 2019 (OECD Recommendation of the Council on Artificial Intelligence). At regional level European Union (EU) has played a major role. The EU's Robolaw Project identified five key areas for AI regulation. Following the project, the EU parliament adopted three regulations in October 2020 covering civil liability, intellectual property, and ethics in AI. The Commission's 2021 proposal emphasized transparent, safe, and secure AI development, upholding human rights. Similarly, more international harmonization is required to establish a more unified international approach which is essential for fostering global collaboration in AI-driven creativity. Encouraging global policymakers and stakeholders to collaborate on developing harmonized international standards and guidelines for the protection of AI-generated works is needed.

Ultimately, navigating copyright in the age of AI requires a collaborative effort. Legal scholars, policymakers, technologists, and creative communities must work together to develop a framework that fosters innovation while safeguarding the rights of creators, both human and machine. By embracing these complexities, we can ensure that AI's creative potential flourishes within a fair and balanced copyright ecosystem.

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