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# AI GENERATED WORKS AND COPYRIGHT PROTECTION

**Abstract.** The ***purpose of the article*** is to find the most promising and practical way of applying copyright to AI generated works, taking into account the objectives of copyright law and technological progress.

***Research methods.*** The methodology of this study includes analytical, comparative and dialectic methods of scientific research.

***Results.*** Due to the human-centered approach to authorship, the existing copyright legislation of most countries cannot provide protection for AI generated works. Even the concept of computer-generated works, implemented in the legislation of some countries, cannot fully resolve all complex issues concerning AI generated works, because it confers copyright on those, who design and operate AI systems. At the same time, another concept, proposed for AI generated works, regards such works as public property (public domain), which may be good for the general public, but not good for those who create and operate AI systems. As for the novel concept of electronic persons, providing legal personality for autonomous AI systems, this approach is quite flexible as it allows giving copyright to an AI system itself and enables the owner of such a system to control the exercise of copyright by this system. However, it may still take a while before this concept is finally appreciated and implemented. In fact, it may even require reaching the next stage of AI development, namely Artificial General Intelligence (AGI).

***Conclusions.*** At present, copyright law does not protect AI-generated works in most countries. Only a few countries have copyright legislation on computer-generated works applying to the works created by AI systems. According to this legislation, copyright is given to those who have undertaken the necessary arrangements in order for the computer to produce the works. Even though this approach protects the economic interests of those who design and operate AI systems, it cannot always provide a fair allocation of copyrights in situations, involving a large number of stakeholders, due to the complexity of such systems. Another idea is to treat AI generated works as public property (public domain). However, it cannot have a wide application, as it lacks the incentives for those who design and operate AI systems. In theory, it is also possible to give autonomous AI systems their own legal personhood enabling them to become copyright owners. In this case, autonomous AI systems with the legal status of electronic persons could be recognized as authors of the works they generated. This flexible approach also enables the owners of AI systems to control the exercise copyrights belonging to such systems. Although it is unclear if the concept of electronic person can be implemented at this point, it is quite likely to be recognized when the stage of Artificial General Intelligence (AGI) is reached.

**Key words:** artificial intelligence, intellectual property, copyright, AI generated works, legal personhood, electronic person.

## 1. Introduction

Artificial intelligence (AI) is no longer science fiction. Due to the advances in digital technologies, AI applications have recently been developing at an accelerating pace. AI is already deployed in different application domains, e.g., recommendation systems, spam filters, image recognition, voice recognition, virtual assistants, etc. (Delipetrev, Tsinarakli, Kostić, 2020, p.4). As a result, AI is starting to have a significant impact on our daily lives, economy and society as a whole. As AI gradually penetrates all areas of life, it becomes increasingly clear that the use of AI has to be governed by

law. Like many other new technologies, AI raises a wide range of legal and human rights issues. According to Rowena Rodrigues, the AI-related issues include: the lack of algorithmic transparency; cybersecurity vulnerabilities; unfairness, bias and discrimination; the lack of contestability; legal personhood issues; intellectual property issues; adverse effects on workers; privacy and data protection issues; liability for damage and lack of accountability for harms (Rodrigues, 2020).

Among numerous legal issues and challenges associated with AI, the issues of intellectual property seem to be the most evident as AI is increasingly used for creative purposes. In recent years, there have been a lot of examples of AI systems writing novels, essays and articles (Loutfi, 2021), painting pictures (the next Rembrandt), and composing music (Lauder, 2017). Contrary to a common belief that only humans are capable of being creative, modern AI systems demonstrate a growing capacity to produce creative works. The creative potential of AI must not be ignored by law in the sense that there has to be a clear and unambiguous legal approach to dealing with AI generated works that would promote innovation in the field of AI and its creative application. Taking into account the above, it is necessary to explore all potential options of copyright protection with regards to AI generated works.

In this respect, it is necessary to give credit to lawyers and scholars, such as R. Rodrigues, C. R. Davies, L. Gathercole, M. Iglesias, S. Shamuilia and A. Anderberg, S. F. Hedrick, M. Kop, I. Veiksa, R. Free, R. D. Brown, S. Karnouskos, who have already examined some legal issues of AI and various ways of applying copyright protection to AI generated works. Although many interesting ideas regarding the application of copyright law to AI generated works have been put forward, the findings of the legal research on this issue vary dramatically. Therefore, the purpose of this study is to find the most promising and practical way of applying copyright to AI generated works, taking into account the main objectives of copyright law as well as technological progress.

This study involves the use of analytical, comparative and dialectic methods of scientific research. The analytical method is used for exploring different avenues of copyright application to AI generated works as well as examining the relevant legislation. The use of the analytical method is coupled with the comparative method of research, which is used for identifying the advantages and shortcomings of different concepts suggesting copyright protection for AI generated works. The dialectic method is applied for the investigation of AI technological development stages.

## 2. AI generated works and current copyright regulation

As AI systems become increasingly sophisticated, their autonomy and creative capacity grow considerably. In fact, even today, when we can witness only the dawn of the AI era (the stage of the so-called "weak AI" or "Artificial Narrow Intelligence"), intelligent machines powered by AI are already capable of producing original creative works by themselves. In other words, creative activities leading to the appearance of new original works are no longer the monopoly of human beings.

Naturally, it gives rise to a question – is the current copyright law ready to face a new reality, in which original works are created not only by humans, but by smart machines as well? For the vast majority of countries, the answer is no. In particular, C. R. Davies concludes that the current regime is woefully inadequate to deal with the growing use of more and more intuitive artificial intelligence systems in the production of such works (Davies, 2011).

The thing is that the existing copyright law has been built on the idea that creativity is a purely human attribute. Hence, the origins of copyright are basically human. As a result, only a human author can have moral rights to his/her works, whereas economic rights to such works also originate from a human author even in the case of their transfer to another individual or a legal person.

This human-centered approach to authorship is well reflected in the copyright legislation of Ukraine. In particular, the Law of Ukraine "On copyright and related rights" defines an author as a natural person, who produced a work by way of creative labor. The approach is quite similar in many other countries. According to M. Iglesias, S. Shamuilia and A. Anderberg, most copyright legislation across EU Member States is very much dependent on human-centred concepts, for: the beneficiary of protection (i.e. the author); the conditions for protection (e.g. originality); and the rights granted (economic, but also moral rights). This human-centred focus is also present in the *acquis communautaire*, although arguably to lesser extent due to the lack of regulation on moral rights... The outcome is similar under US law. The US Copyright Act protects original works of authorship and, to qualify as a work of authorship, a work must be created by a human being. The general guide to the policies and procedures of the US Copyright Office is also clear in this regard: 'the Office will not register works produced by a machine or mere mechanical process that operates randomly or automatically without any creative input or intervention from a human author (Iglesias, Shamuilia, Ander-

berg, 2021, p. 14; the Compendium of U.S. Copyright Office Practices).

Given the above, it is possible to conclude that under the existing legislation of most countries, copyright protection applies only to original works created by human authors. Therefore, currently works created by autonomous AI systems cannot be protected by copyright, even if they meet the criterion of originality. So, it turns out that there is a large gap in the copyright regulation when it comes to the original works generated by autonomous AI systems.

Considering the objectives of copyright law, the current lack of copyright protection for AI generated works appears to be unacceptable. The main purpose of intellectual property law in general and copyright law in particular is to promote creative activities and innovation by providing legal protection for the results of such activities. If there is no copyright protection for the works generated by AI systems, there will be no incentives for high-tech companies to design new AI systems and no incentives for users to make use of such systems for creative purposes. As a result, this lack of incentives may lead to lower investments in the development of AI and a lower level of creative activities in the field of science, literature, art and entertainment industry, holding back scientific, economic and cultural progress.

**3. AI generated works and human copyright holders**

Unlike most countries, where there is no copyright protection for AI generated works, some countries, including the UK, South Africa, Hong Kong, India, Ireland and New Zealand, have enacted legislation protecting computer-generated works ... In the UK, computer-generated works are defined as works 'generated by computer in circumstances such that there is no human author of the work' (Iglesias, Shamuilia, Anderberg, 2021, p. 13). Thus, the concept of computer-generated works applies to works created by autonomous AI systems.

According to Laura Gathercole, the current position under the Copyright, Designs and Patents Act 1988 is that, where a computer has generated the works, the author is the person who has undertaken the necessary arrangements in order for the computer to produce the works. The author enjoys copyright protection for 50 years from the date of creation (Gathercole, 2022). In other words, in a situation where there is no real human author of an AI generated work, there is a possibility of designating a copyright holder who will act as an author. This pragmatic approach provides the possibility of granting copyright to a person, who has made the most significant contribution to the creation and operation of an autonomous AI

system, which generated a work. In most cases a copyright holder is likely to be either the programmer or the user of an AI system.

This approach seems to be largely in line with the views, expressed by Ingrida Veiksa, who points out that works created by artificial intelligence must be protected by copyright, and such protection must not differ from the usual (traditional) protection of authors' works ... and only humans can be recognized as the author of a work, and no computer or algorithm can be identified as the copyright owner (Veiksa, 2021, p. 235). Furthermore, as Samantha Fink Hedrick points out, the incentives inherent in the copyright bargain – and the very rationale for the existence of copyright law – are only advanced when copyright is allocated to a human, whether that is the programmer, user, data owner, or a combination of them (Hedrick, 2019, p. 375).

At the same time, the concept of computer-generated works has its drawbacks. Due to the growing complexity of modern AI systems, it is not always possible to clearly identify a person, who has undertaken all necessary arrangements for the AI system to produce a work, because in many cases there are dozens of people involved in the process of designing, programming, training and running an AI system. In this regard, it is not quite clear how the concept of computer-generated work addresses the use of various data for machine learning, which is considered to be a crucial part of any modern AI system. The thing is that such data may belong to different persons, who are neither programmers nor users of AI systems. So, the question is whether they can also be recognized as co-authors of the works created AI systems using their data. For instance, it is quite possible for a modern AI system to create a beautiful picture after studying hundreds or thousands of paintings created by human artists. Would it be fair not to recognize these human artists as co-authors of an AI generated picture along with the programmers and users of the relevant AI system?

In addition, an autonomous AI system, which is capable of making its own decisions, may resort to some illegal actions, like stealing data from their rightful owners, without the knowledge and authorization of those in charge of such a system. A situation like this may give rise to questions like: "Who is going to be responsible for such violations?", or "Is it fair to make persons, who design or run autonomous AI systems, responsible for their violations?".

**4. AI generated works and the public domain**

Unlike the concept of computer-generated works, which aims to provide incentives for all

those involved in the creation and use of AI systems by granting them copyright protection, the concept of public domain for AI generated works has a completely different objective. It is aimed at providing open access for the general public to the works generated by AI systems, rather than protecting individual economic interests.

According to the proponents of the AI public domain, the concept of AI at the current state of the art does not need an incentive to create, nor recognition or reward for its endeavours. It simply does not need exclusive rights. Additionally, it is argued that extending copyrights hinders innovation, cultural diversity and even fundamental freedoms, and adding extra layers to the existing rainbow of IP rights is not a good solution to balance the societal impact of technological progress. Drawing inspiration from the Roman Law, Mauritz Kop puts forward an idea of Res Publicae ex Machina (Public Property from the Machine) for AI creations that crossed the autonomy threshold. According to him, the introduction of the legal concept of Public Property from the Machine is a Pareto improvement; many actors benefit from it while nobody – at least no legal person – will suffer from it (Kop, 2020, p.p. 306, 339).

On the face of it, this approach puts the interests of the general public first. In theory, on the one hand, the fewer restrictions, the better for people and companies, when it comes to using AI generated works. However, on the other hand, this approach may discourage investment in complex and costly IA development projects as investors will not be willing to spend their money on technologies that do not yield a profit. From a practical point of view, this approach appears to be suitable only for state-funded and charitable projects of AI development designed to meet some social needs. Big high-tech companies are unlikely to engage in such projects without any copyright protection of their economic interests.

The copyright law has to ensure a well-balanced approach to the protection all stakeholders' interests (both the creators and the general public). Striking this balance is not an easy task, when it comes to the copyright protection of works generated by autonomous AI systems. Certainly, AI generated works must be recognized eligible for copyright protection. At the same time, this protection must not become an insurmountable barrier for all those interested in using these works. In light of this, the concept of public domain for AI generated works (Public Property from the Machine) does not seem to have a universal application, even though it may be applied to the works created by state-funded or charitable AI projects.

In general, the public domain for AI generated works would be appropriate after the expiration copyright protection, just like in the case of other literary and art works.

If the concept of public domain is ever applied in relation to AI generated works, the issues of moral rights to such work will remain anyway. According to the classic approach of the public domain concept, which is well reflected in article 30 of the Law of Ukraine "On copyright and related rights", only economic rights to works are transferred into the public domain after the expiration of a certain time period. This transfer, essentially, means that such a work may be used without paying any fees to its copyright owner. An author's moral rights to works must be observed even after this transfer takes place. Therefore, the basic question remains the same – who is entitled to claim authorship for an AI generated work? The public domain concept does not seem to provide any answers to this question.

**5. AI generated works and the legal personhood of AI systems**

Copyright protections for AI generated works based on the concepts of public domain and computer-generated works have their roots in the current anthropocentric copyright legal regime. Thus, it is natural that the drawbacks of these concepts with regards to AI generated works are also caused by the human-centered approach of the existing copyright law. So, what about an alternative to this approach?

In recent years, the growing autonomy of modern AI systems, the narrowing gap between AI and human intelligence as well as numerous legal issues stemming from the application of AI systems have provided ample grounds for interesting suggestions of granting autonomous AI systems their own legal personhood. Furthermore, these suggestions are no longer purely theoretical as they are considered at the level of the European Parliament and take shape of recommendations to the Commission (European Parliament resolution).

Although these proposals and recommendations to the Commission primarily deal with the issues of civil liability for the damages resulting from the application of AI systems, the very idea of granting AI systems legal personality and turning them into the so-called "electronic persons" implies a totally new approach to many AI related problems in different areas of law, including copyright law.

In fact, the emergence of new legal entities, such as "electronic persons", may signify one of the greatest shifts in the field of law in centuries. Ever since legal persons came into existence there have been only two types of legal subjects, namely natural persons and legal persons.

If the idea of creating electronic persons as legal subjects gains recognition and eventually finds its way into the legislation, natural and legal persons will have to share the legal space with electronic persons. With regards to the AI related issues of copyright the emergence of electronic persons as the embodiment of the legal personality of autonomous AI systems may be quite significant, as it offers new avenues of solving the existing problems of authorship and copyright for AI generated works.

In theory, the legal personhood of autonomous AI systems may serve as a legal basis for recognizing autonomous AI systems as the authors of copyright and owners of intangible assets. In light of this, it is worth considering some of the options, set out by Dr. Rachel Free. According to her, "one option is to enable the autonomous AI itself to own the intangible assets. Those who argue that giving autonomous AI the status of a legal person would address the issue of accountability, effectively imply this solution... if a fully autonomous robot, such as Rachel in Bladerunner, has the status of a legal person, then it follows that she can be an inventor and subsequent owner of a patent. In the same way, she could be the author of copyright in a computer program..." (Free, 2018). Although in this case the status of legal person is referred to as a precondition for owning intangible assets and being an author of copyright, it is possible to assume that the status of electronic person might also be appropriate.

According to the same legal scholar, another option might be giving autonomous robots a status akin to that of a child. A human would then be responsible for the robot in the same way a human parent or guardian is responsible for a child (Free, 2018). In this case it is necessary to point out that a child is a natural person, who can have rights and duties, even though a child's legal capacity is somewhat limited. The idea of a child-like status for robots suggests that an autonomous AI system as an electronic person could have a limited legal personality and remain under the control of natural and legal persons. In effect, regardless of whether AI systems are granted legal personhood, they themselves will always remain someone's property, which means that they will always be under the legal control of natural and legal persons. This approach gives some flexibility, which means that an autonomous AI system as an electronic person could be recognized as a copyright owner and an author, whereas the owners of such a system itself could control the use of copyright and protect the authorship belonging to an AI system.

Although in theory it is possible for an autonomous AI system to become an electronic person with certain intellectual property rights, including the rights to claim authorship and to enjoy copyright protection, it is far from clear if the society is ready to accept this idea. Perhaps, the most likely scenario is the one described by Rafael Dean Brown. According to him, "it is unlikely that governments and legislators will suddenly recognise in one event AI's ownership of property and AI's legal personhood. Rather, acceptance of AI's legal personhood, as with the acceptance of a corporate personhood will develop as a process and in stages, ... However, as AI develops its ability to communicate and assert more autonomy, then AI will come to own all sorts of digital assets" (Brown, 2021, p. 233). In other words, the recognition of AI systems' personhood will depend on the technological progress of AI. Therefore, it is possible to assume that the conferral of intellectual property rights, including copyright, on autonomous AI systems will also depend on the progress of AI technology.

There are several evolutionary levels of AI, including Artificial Narrow Intelligence (ANI) or weak AI, Artificial General Intelligence (AGI) also known as strong AI or Human-Level AI and Artificial Super Intelligence (ASI), surpassing by far human capabilities. Although we are still in the age of ANI with self-driving cars, voice interactions (e.g., Siri/Cortana), recommendations (e.g., Amazon and Facebook), automatic translations (Google translate), the next level, i.e., AGI may not be very far in the future (Karnouskos, 2022, p.94).

While at the current level of weak AI (ANI) the discussion of AI systems' legal personhood and the conferral of intellectual property rights on such systems appears to be largely theoretical, the next level of AI development (AGI) will pose practical challenges for people living side by side with human-like intelligent machines. So, it is not difficult to predict that the advent of strong AI (AGI) may turn this theoretical issue into a practical one, as there may be a pressing need to recognize autonomous AI systems as electronic persons capable of being authors and enjoying copyright protections. At the same time, it is necessary to be careful with the legal personhood of autonomous AI systems and the conferral of intellectual property rights on them. In the interests of humanity, the legal personhood of such systems will have to be limited at the stage of AGI and even more so at the stage of ASI. As for AI systems' intellectual property rights, they should be exercised under human supervision and control, since it is important to prevent any dangerous concentration of intellectual property rights, including copyright, in the hands of intelligent machines.

**6. Conclusions**

As a conclusion, it is necessary to point out that the copyright legislation of most countries is currently not ready to deal with AI generated works and, as a result, such works are not protected by copyright.

At the same time, a number of countries have adopted the legislation on computer-generated works allowing to protect such works by conferring copyright on those, who has undertaken the necessary arrangements in order for the computer to produce the works. However, it is not quite clear how this approach can apply to works, generated by complex AI systems, involving the activities of a large number of professionals and/or requiring the use of data belonging to different persons. So, even though this approach protects the economic interests of those, who design and operate AI systems, it cannot always provide a fair allocation of copyright in complex situations, involving a large number of stakeholders.

Another approach discussed in the legal community is to treat AI works as public property (public domain) with open access for the general public. Although the public domain concept may potentially apply to works created by state-funded or charitable AI projects, it cannot have a wide application, as it lacks incentives for all those, who design and operate AI systems.

There is also a hypothetical possibility of giving autonomous AI systems their own legal personhood and enabling them to be copyright owners. In this case autonomous AI systems as electronic persons with their own legal personality could be recognized as the authors of the works they generated. This approach appears to be quite flexible, as it also allows the owners of autonomous AI systems to control the exercise of copyrights belonging to such systems (electronic persons). At the same time, it is unclear, if the society is ready to implement the concept of electronic persons (AI systems' legal personhood) at this point. It is more likely that over time, when we move from the weak AI (ANI) to the strong AI (AGI) stage of AI technological development, the governments will realize that this legal innovation is necessary. However, the recognition of autonomous AI systems as electronic persons and copyright owners has to have certain limitations enabling the human owners of such systems to control the exercise of their copyrights.

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# ТВОРИ, СТВОРЕНІ ШТУЧНИМ ІНТЕЛЕКТОМ, ТА ЇХ ОХОРОНА АВТОРСЬКИМ ПРАВОМ

**Анотація.** *Метою* статті є виявлення найбільш перспективного та практичного способу застосування авторського права до творів, створених штучним інтелектом, з урахуванням цілей авторського права та технічного прогресу.

*Методи дослідження.* Методологія цього дослідження включає у себе аналітичний, порівняльний та діалектичний методи наукового дослідження.

*Результати.* З огляду на підхід до авторства, орієнтований на людину, наявне законодавство про авторське право більшості країн не може забезпечити захист творів, створених штучним інтелектом. Навіть концепція комп'ютерних творів, запроваджена у законодавстві деяких країн, не може повною мірою вирішити всі складні питання, що стосуються творів, створених штучним інтелектом, незважаючи на те, що вона надає авторські права тим, хто розробляє та керує системами штучного інтелекту. Водночас інша концепція, запропонована для творів, створених штучним інтелектом, розглядає такі твори як суспільну власність (суспільне надбання), що може бути корисним для широкої громадськості, але не корисним для тих, хто створює та керує системами штучного інтелекту. Що стосується нової концепції електронних осіб, яка говорить про правосуб'єктність автономних систем штучного інтелекту, цей підхід є досить гнучким у тому сенсі, що він дозволяє надати авторське право самій системі штучного інтелекту та дає можливість власнику такої системи контролювати здійснення авторського права цією системою. Однак для того щоб ця концепція була нарешті оцінена та реалізована, може знадобитися ще деякий час. Насправді, це може навіть вимагати досягнення наступного етапу розвитку штучного інтелекту, а саме штучного загального інтелекту.

*Висновки.* Нині авторське право в більшості країн не захищає роботи, створені штучним інтелектом. Лише в кількох країнах діють закони про авторське право на комп'ютерні твори, які застосовуються до творів, створених за допомогою систем штучного інтелекту. Відповідно до цього законодавства авторське право надається тим, хто вжив необхідних заходів для того, щоб комп'ютер створив твір. Незважаючи на те, що такий підхід захищає економічні інтереси тих, хто розробляє та експлуатує системи штучного інтелекту, через складність таких систем він не завжди може забезпечити справедливий розподіл авторських прав у ситуаціях із залученням великої кількості зацікавлених осіб. Інша ідея полягає в тому, щоб розглядати створені штучним інтелектом твори як суспільну власність (суспільне надбання). Однак він не може мати широкого застосування, оскільки не забезпечує стимулів для тих, хто розробляє та керує системами штучного інтелекту. З теоретичної точки зору також можна надати автономним системам штучного інтелекту власну правосуб'єктність, що дозволить їм стати власниками авторських прав. У цьому випадку автономні системи штучного інтелекту з правовим статусом електронних осіб можуть бути визнані авторами створених ними творів. Цей гнучкий підхід також дозволяє власникам систем штучного інтелекту контролювати використання авторських прав, що належать таким системам. Хоча поки що неясно, чи можна реалізувати концепцію електронної особи на такому етапі, цілком ймовірно, що вона буде реалізована тоді, коли буде досягнута стадія загального штучного інтелекту.

**Ключові слова:** штучний інтелект, інтелектуальна власність, авторське право, твори, створені штучним інтелектом, правосуб'єктність, електронна особа.