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New Frontiers and The Impact of Artificial Intelligence and the Digital Revolution on the Future of Intellectual Property Laws

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Abstract

Artificial intelligence (AI) had already embedded itself into our everyday lives. AI as an assistive tool adequately responds to humans' needs, such as virtual digital assistance, and almost everyone will have Apple Siri, Alexa or Google Home. Relying on AI systems, such as Spotify, to provide a recommended list of music based on our existing music choices and preferences is commonplace, and likewise, for producing works of art. Most notably, a project team behind The Next Rembrandt designed algorithms that allowed a computer to create a painting in the style of the 17th-century Dutch artist. AI can produce works which could be considered as copyright works though international law has yet to acknowledge AI as a copyright owner. AI systems are reshaping the whole creative and innovative sectors that are protected in the existing intellectual property (IP) systems. The paper examines the AI systems at present, defining and distinguishing between 'AI-assisted' and 'AI-generated' outputs, and outlines the direction of AI development in the context of IP law. It analyses IP and AI regulation from both the Global North and Global South perspectives with an overall recommendation for new trade-related AI and IP standards (TRAIIPS) as an extension of trade-related intellectual property standards (TRIPS).

Keywords: intellectual property, artificial intelligence, copyright, EU AI Act, Global North and Global South

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1. Introduction

The paper will examine the legal challenges to copyright law posed by using AI-generated systems. Up until very recently, where AI assisted the creation of a work, such as the Rembrandt 2.0, it could be considered as copyrightable.[1] However, where AI has generated the work, the law has yet to acknowledge AI as a copyright owner.[2] In December 2023, the Beijing Internet Court made a landmark decision to grant copyright protection to an AI-generated image in *Li v Lui*.[3] The Chinese ruling is at odds with the US Copyright Office which earlier in 2023 held that AI-generated images are not the product of human authorship.[4] There is considerable economic investment that goes into the development of AI systems and if there are no IP laws to protect the work that is created, it must then be free to use in the public domain. Consequently, this paper considers how AI has become the black swan of IP systems and needs its own set of IP laws that are specifically tailored to its creation of outputs. Given the global impact of copyright law, the paper is dedicated to the examination of existing case law and legislative efforts from Global North regions such as the US, EU[5] and the UK, and cross references to the Global South, with a spotlight on China.

The paper critically assesses relevant case law for AI and copyright disputes, such as the US class action lawsuits against ChatGPT,[6] whilst analysing the most current

[1] Andreas Guadamuz, 'Artificial intelligence and copyright' *WIPO Magazine* (October 2017) 14.
[2] Alexander Cuntz, Carsten Fink and Hansueli Stamm, 'Artificial Intelligence and Intellectual Property: An Economic Perspective' Economic Research Working Paper No 77/2024 (WIPO, 2024).
[3] Beijing Internet Court Civil Judgment (2023) Jing 0491 Min Chu No 11279.
[4] Second Request for Reconsideration for Refusal to Register Théâtre D'opéra Spatial (SR # 1-11743923581; Correspondence ID: 1-5T5320R) Letter to Tamara Pester (5 September 2023): 'The Review Board of the United States Copyright Office ("Board") has considered Jason M. Allen's ("Mr. Allen") second request for reconsideration of the Office's refusal to register a two-dimensional artwork claim in the work titled "Théâtre D'opéra Spatial" ("Work"). After reviewing the application, deposit copy, and relevant correspondence, along with the arguments in the second request for reconsideration, the Board affirms the Registration Program's denial of registration. The Board finds that the Work contains more than a de minimis amount of content generated by artificial intelligence ("AI"), and this content must therefore be disclaimed in an application for registration. Because Mr. Allen is unwilling to disclaim the AI-generated material, the Work cannot be registered as submitted.'
https://fingfx.thomsonreuters.com/gfx/legaldocs/byprrqkqxpe/AI%20COPYRIGHT%20REGISTRATION%20decision.pdf.
[5] Pieter De Grauwe and Sacha Gryspeerdt, 'Artificial intelligence (AI): The qualification of AI creations as "works" under EU copyright law' *Grewer* (22 November 2022).
[6] *Authors Guild, David Baldacci, Mary Bly, Michael Connelly, Sylvia Day, Jonathan Franzen, John Grisham, Elin Hilderbrand, Christina Baker Kline, Maya Shanbhag Lang, Victor Lavalle, George R.R. Martin, Jodi Picoult, Douglas Preston, Roxana Robinson, George Saunders, Scott Turow, And Rachel Vail, Individually And On Behalf Of Others Similarly Situated, Plaintiffs, V. Openai Inc., Openai Opco Llc, Openai Gp Llc, Openai Llc, Openai Global Llc, Oai Corporation Llc, Openai Holdings Llc, Openai Startup Fund I Lp, Openai Startup Fund Gp I Llc, Openai Startup Fund Management Llc, And Microsoft Corporation*, Defendants. No. 1:23-Cv-8282-SHS, Class Action Complaint.

literature.[7] The key research problem to be addressed is how AI and copyright can be regulated within the current IP ecosystem when it comes to consent, legality, misuse, privacy issues, liability, trustworthiness and ethics as well as protecting the economic and moral rights of the human author. The methodology is focused on empirical research on the publishing, arts and music sectors and will be split into the categories of data collection, design and build, anonymisation and data analysis, to propose new frameworks and regulations for copyright protection in the digital AI space. For IP law and AI development, the IP legal systems are under increasing pressure to strike a balance between supporting the innovation growth potential of AI systems against the effects on society, human creativity and social cohesion.[8]

1.1 The Legal Challenges to Copyright Law Issues Posed by AI-generated Works

This paper examines the legal challenges to copyright law issues posed by AI-generated works. Copyright protects the original works of human authors, while AI-generated works would not be protected under the existing copyright law, even if the work is original, as it does not satisfy the 'human' test for copyright protection. This largely hinges on the idea–expression dichotomy: the expression of the idea can only be 'expressed' by the human author. The ownership and authorship issues focus on the role of AI as assisted versus generated. The role of the human author in AI-assisted outputs is in the alterations and edits to the final work as an output. AI-generated works essentially involve the AI system creating a final output without any human intervention and there are foreseeable challenges to the ownership and authorship of such works. AI-generated works cause legal and ethical challenges to copyright laws on an international level. Chinese case law can be contrasted with the Global North to better inform recommendations for new legal maxims that create laws, regulations and policies for copyright law through new trade-related standards to supplement existing TRIPS standards.

2. Overview of Artificial Intelligence Systems

In 1961, Marvin Minsky made considerable strides on the role AI systems can play in solving difficult problems and how machine learning can be utilised for higher-level problem-solving. Minsky defined AI as:

> 'the science of making machines do things that would require intelligence if done by men'.[9]

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[7] Nicola Lucchi, 'ChatGPT: A Case Study on Copyright Challenges for Generative Artificial Intelligence Systems' (2023) *European Journal of Risk Regulation* doi:10.1017/err.2023.59.

[8] Nadia Naim and Hui Yun Chan, 'Intellectual Property and Health Technological Innovations at the time of the Pandemic' (2024) *Law and Development Review* https://doi.org/10.1515/ldr-2024-0009.

[9] Marvin Minsky, 'Steps Toward Artificial Intelligence' (1961) 49(1) *Proceedings of the IRE* 8.

Fast forward to the 21st century and there has been exponential growth in AI development. In May 2019, the Organization for Economic Cooperation and Development (OECD) defined AI systems as:

> 'a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment.'[10]

The most significant development in the regulation of AI is from the EU, which has approved its first ever AI Act. This is a global first and acts as a legal framework on AI, addressing the risks of AI and positioning Europe to play a leading role in the future development of AI laws.[11] Members of the European Parliament (MEPs) approved proposals to address long-term opportunities and legal challenges posed by AI in ethics, civil liability and IP, but the EU AI Act does not make provisions for IP law and, as such, the impact of IP requires urgent legal consideration.[12] The question remains as to what is an effective IP system that safeguards innovation and creation where AI is generating the potentially copyrightable work as there is no legal remedy in IP law or alternatives such as contract law. There are currently no uniform international contractual law provisions or clauses used by all or most AI service providers when licensing AI systems for commercial or public organisational use. The EU has developed its final model contractual AI clauses which will be for procurement clauses of AI in public authorities.[13] China has also created new regulations for AI services by approving Interim AI Measures. This is China's first AI-specific administrative regulation on the management of generative AI services.[14]

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[10] Organization for Economic Cooperation and Development, 'OECD AI Principles overview' https://oecd.ai/en/ai-principles.
[11] Tambiama Madiega, 'Artificial Intelligence Act' Briefing: EU Legislation in Progress (2023) https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/698792/EPRS_BRI(2021)698792_EN.pdf.
[12] Timo Gaudszun and Jeffrey Shin, 'AI Watch: Global regulatory tracker – European Union' White & Case (2025) https://www.whitecase.com/insight-our-thinking/ai-watch-global-regulatory-tracker-european-union.
[13] European Commission, 'Procurement of AI' (29 September 2023) https://public-buyers-community.ec.europa.eu/communities/procurement-ai/resources/eu-model-contractual-ai-clauses-pilot-procurements-ai.
[14] Interim Measures for the Administration of Generative Artificial Intelligence Services (2023). Cyberspace Administration of China, National Development and Reform Commission of the People's Republic of China, Ministry of Education of the People's Republic of China, Ministry of Science and Technology of the People's Republic of China, Ministry of Industry and Information Technology of the People's Republic of China, Ministry of Public Security of the People's Republic of China, State Administration of Radio and Television. Also see, Amy Yang and Bob Li, 'AI Watch: Global regulatory tracker – China' White & Case (2025).

3. World Intellectual Property Office and the Use of AI in Copyright Law

Copyright does not protect ideas, only the expression of an idea – that is, its tangible form – and others are free to create similar, or even identical, works if they do so independently and by their own efforts.[15] In other words, copyright does not necessarily create a monopoly in a particular work. The concept is recognised in international law by the TRIPS, Article 9(2) of which states:

> 'Copyright protection shall extend to expressions and not to ideas, procedures, methods of operation or mathematical concepts as such.'[16]

The TRIPS agreement established minimum levels of IP protection that each World Trade Organization (WTO) Member State is required to provide to gain membership status. TRIPS sets out a 'one size fits all' approach to international IP, extending the reach of the Berne Convention.[17] The challenge now is whether to extend TRIPS to include AI-generated works as TRAIIPS and, if so, how to implement it as a new, or extended, minimum standard.

3.1 Intellectual Property and Frontier Technologies

The World Intellectual Property Office (WIPO) leads several conversations on intellectual property and frontier technologies. Through the conversations, WIPO seeks to clarify the line between AI-assisted and AI-generated outputs, on the basis that they would lead to substantially different recognitions.[18] AI-assisted copyrightable outputs are non-contentious, on the premise that the human author is still the creator, using AI assistance as a sophisticated tool akin to a camera or paintbrush.[19] The level of AI assistance to the human author is much more sophisticated than any previous assisting tool, and problems increasingly arise from the role of AI in the creating copyright. From the legal perspective, who should own the copyright is not established, as it is not clear what amount of human input is sufficient to attribute the ownership of the copyright to the human and satisfy the copyright threshold. Legal systems do not consider the specifics of the content being created by AI. WIPO does not offer universal definitions for AI-assisted, or AI-generated copyrightable works. Instead, a jurisdictional approach of most recent

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[15] World Intellectual Property Office, 'Understanding Copyright and Related Rights' (2016) https://www.wipo.int/edocs/pubdocs/en/wipo_pub_909_2016.pdf.
[16] World Trade Organization, 'Uruguay Round Agreement TRIPS Article 9(2)' https://www.wto.org/english/docs_e/legal_e/27-trips_04_e.htm.
[17] WIPO Lex, 'Berne Convention for the Protection of Literary and Artistic Works' https://www.wipo.int/wipolex/en/treaties/textdetails/12214.
[18] WIPO Conversation on Intellectual Property (IP) And Artificial Intelligence (AI) Second Session Revised Issues Paper on Intellectual Property Policy And Artificial Intelligence Prepared by The WIPO Secretariat (21 May 2020).
[19] WIPO Conversation on Intellectual Property (IP) and Artificial Intelligence (AI), Third Session, Geneva, 4 November 2020. Summary Of Second and Third Sessions. Document prepared by the WIPO Secretariat.

developments offers more insight into the legal challenges and opportunities posed by AI systems.

3.2 The AI-assisted Copyright Model

The AI-assisted copyright model creates an added layer to the idea–expression dichotomy and has three stages: conception; execution; and redaction. When assessing AI assistance in copyright works, the starting point is the conception stage. The AI-assisted copyrightable outputs would start with the human creator as the concept initiator, like the idea or lightbulb moment. The execution stage is essentially the assistance; the AI system interprets the conception input and draft versions are produced where the work is wholly the result of the AI system. The final stage of the creative process reverts to the human creator for redaction,[20] which requires further prompts for editing and finalising the work. For example, a musician using an AI music composer will often edit the output before releasing the music as a final work. While AI systems play a dominant role at the execution phase, the role of the human author at the conception stage remains essential.[21]

Once the conception and execution stages have been satisfied, the human author will oversee the redaction stage to create the final output. Depending on the level of human involvement across the three stages, this will often allow the human author sufficient creative choice and copyright authorship. Assuming these choices are expressed in the final AI-assisted output, it will then qualify as a copyright-protected work.[22] By contrast, if an AI system is programmed to automatically execute content without the output being conceived or redacted by a person exercising creative choices, there will be no copyrightable work: it will be considered AI-generated and in the public domain.[23]

4. The UK Perspective on Copyright Law and AI-generated Works

The UK copyright laws are set out in the Copyright Design Patent Act (CDPA) 1988. It is important to define who can legally be named as the author as this has a significant impact on the future of AI in copyright law. At section 9(1) CDPA, the definition of the

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[20] Nadia Naim, 'Artificial Intelligence Creations and Ownership – Who Should the Intellectual Property Belong To?' in Nadia Naim (ed), *Developments in Intellectual Property Strategy* (Palgrave Macmillan, 2024) https://doi.org/10.1007/978-3-031-42576-9_1.
[21] Kristofer Erickson, 'Copyright protection in AI-generated works: Evolving approaches in the EU and China' (Creative Industries Policy and Evidence Centre, 17 July 2024).
[22] Bernt Hugenholtz and Joao Pedro Quintais, 'Copyright and Artificial Creation: Does EU Copyright Law Protect AI-Assisted Output?' (2021) 52 *International Review of intellectual Property and Competition Law* 1190.
[23] Adnan Masood, 'Intellectual Property Rights and AI-Generated Content — Issues in Human Authorship, Fair Use Doctrine, and Output Liability' Medium (4 April 2025) https://medium.com/@adnanmasood/intellectual-property-rights-and-ai-generated-content-issues-in-human-authorship-fair-use-8c7ec9d6fdc3#:~:text=As%20a%20result%2C%20AI%2Dgenerated,if%20they%20exercise%20creative%20choices.

author, in relation to a work, is the person who creates it, and therefore a natural person. Copyright is automatic as established by the idea–expression dichotomy from Article 9(2) TRIPS. The test for copyright is that it must be original, and this acts as a benchmark in CDPA 1988.[24] Most importantly, the copyright work must fit into a category and demonstrate a level of effort that is worthy of copyright protection. The UK has shifted away from the requirement of a sufficient level of skill, labour and judgement to harmonise with EU law.[25] To gain copyright protection, the work needs to be fixed.[26] For the UK, the work must fit into a specific category and meet the originality requirement.

4.1 Computer-generated Works

Exclusions apply to computer-generated works (CGWs) as a *sui generis* right. Section 178 CDPA excludes CGWs with no human author, to allow non-human authorship of a CGW. It is defined as the person by whom the arrangements necessary for the creation of the work are undertaken.[27] The protection lasts for 50 years from the date the work is made and is the main exception under the current UK copyright law system that allows authorship by generative AI. As per the House of Commons Committee Report 2023,[28] the current duration and application of CGWs will remain the same and no further provisions are to be made. Given the limited scope of CGWs, the UK Government will need to consider the expansion of the provisions as AI systems such as ChatGPT, DALL-E and Midjourney continue to evolve.[29]

4.2 The UK IPO Consultations on IP and AI

After several consultations on copyright and IP, the UK Intellectual Property Office (IPO) has confirmed that a copyright work can be created by a human who has assistance from AI. If the work expresses original human creativity it will benefit from copyright protection like a work created using any other tool. By default, therefore, if the work is AI-assisted or -generated and lacks original human creativity, it cannot be classed as a copyright work.[30] The distinction between when there is human involvement to when there is not needs to be made clearer. This can be achieved with a tiered distinction between AI-assisted and AI-generated in all categories of

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[24] Copyright Design and Patent Act 1988, s 1(a).
[25] Simone Schroff, 'The purpose of copyright—moving beyond the theory' (2021) 16(11) *Journal of Intellectual Property Law & Practice* 1262 https://doi.org/10.1093/jiplp/jpab130.
[26] Copyright Design and Patent Act 1988, s 3(2).
[27] ibid, s 178.
[28] UK Parliament, 'Eleventh Report of Session 2022-23, Connected tech: AI and creative technology' (30 August 2023) https://publications.parliament.uk/pa/cm5803/cmselect/cmcumeds/1643/report.html.
[29] Aaron Hayward et al, 'The IP in AI: Does copyright protect AI-generated works?' Herbert Smith Freehills (16 May 2023) https://www.herbertsmithfreehills.com/insights/2023-05/the-ip-in-ai-does-copyright-protect-ai-generated-works.
[30] Simmons & Simmons LLP, 'Generative AI – the copyright issues' (25 April 2023) https://www.simmons-simmons.com/en/publications/clgxkqd5z000utrj8zuuc5cms/generative-ai-the-copyright-issues.

copyright, not only CGWs. The extent and nature of human involvement needs to be specified. Currently, a human instructs an AI application to produce music of a specific genre. This can be sufficient to make the resulting work fall outside the qualification of AI-generated work and be within the remit of AI-assisted work.[31] This is relevant to authorship and ownership of the work.

The creative process in AI-assisted outputs starts with the human author, who instructs the AI system to create a work. The equivalent production for the idea−expression dichotomy is the human author adapting and changing the work created by the AI system to then produce a final AI-assisted copyrightable work, as established by the *Infopaq* case.[32] The human author is the intellectual creator, and this is the essential requirement for the work to be considered copyrightable in AI-assisted outputs as it is the human author that is satisfying the originality test, not the AI system.[33] For the test of intellectual creation, the author needs to express their creative choices with their own personality.[34] This, therefore, offers a clearer line between the rights that can, or cannot, be given to non-human actors such as AI systems.

The UK Government has proposed a code of practice on copyright and AI, to provide guidance on accessing copyrighted work as an input to the AI models, whilst ensuring there are protections on generated outputs to support right-holders of copyrighted work.[35] This is the main area of contention as AI systems have access to considerable existing copyright material which the human mind cannot decipher or utilise, and if the resultant work is copyrightable, there is potentially a risk that some of the rights of the original copyright owners might be infringed. However, the UK copyright code still has a significant way to go, with existing proposals halted and further proposals to be expected for AI regulation in the UK.[36]

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[31] Emmanuel Deruty, et al, 'On the Development and Practice of AI Technology for Contemporary Popular Music Production' (2022) 5(1) *Transactions of the International Society for Music Information Retrieval* 35 https://doi.org/10.5334/tismir.100.

[32] Judgment of the Court (Fourth Chamber) of 16 July 2009. *Infopaq International A/S v Danske Dagblades Forening*.

[33] ibid nos 6, 11, 35, 37, 38, 45, 47, 50.

[34] Kristofer Erickson, 'Copyright protection in AI-generated works: Evolving approaches in the EU and China' (2024) Creative Industries Policy and Evidence Centre, Newcastle University Business School (17 July 2024) https://pec.ac.uk/blog_entries/copyright-protection-in-ai-generated-works-2.

[35] HM Government, 'HM Government Response to Sir Patrick Vallance's Pro-Innovation Regulation of Technologies Review: Digital Technologies' (March 2023) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1142798/HMG_response_to_SPV_Digital_Tech_final.pdf.

[36] Thomas D Criddle, 'UK shelves proposed AI copyright code in blow to creative industries' *Financial Times* (4 February 2024) https://www.ft.com/content/a10866ec-130d-40a3-b62a-978f1202129e.

5. Legal Challenges in the US Copyright Law and AI-generated Works

The US has seen a plethora of cases challenging the existing IP legal systems on the role of AI-generated works for the purposes of authorship, protection and infringement. Writers and actors have participated in strikes against the use of AI as replacements for human authors, with wider implications on royalties and labour laws. In the Compendium of US Copyright Practices § 313.2, the section clearly states what cannot be registered for copyright protection and includes a photograph taken by a monkey as well as a machine. On the US Copyright Practices on machines, the section states:

> '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. The crucial question is "whether the 'work' is basically one of human authorship, with the computer [or other device] merely being an assisting instrument, or whether the traditional elements of authorship in the work (literary, artistic, or musical expression or elements of selection, arrangement, etc.) were actually conceived and executed not by man but by a machine.'[37]

Dealing with the monkey selfie first, since it was a rare, 'stroke of luck' photograph, neither the camera owner nor the monkey could satisfy the test for copyright protection and therefore the US Court correctly held that the image was not copyrightable.[38] Focusing on machines and copyright, the US has several cases where copyright owners are suing AI companies for copyright infringement. US class action lawsuits against ChatGPT and Bard are at the centre of the AI and copyright battle.[39] George RR Martin, Jodi Picoult and John Grisham are among a group of 17 prominent authors suing Open AI (the owners of ChatGPT) for large-scale copyright infringement. The lawsuit alleges systematic theft of copyrighted work on a mass scale by the AI system owners. The class action complaint is for a jury trial beyond issues of plagiarism and the deeper economic, ethical and morality questions behind how fit for purpose human laws for copyright are, against the use of AI in a field that is considered by many as inherently human. The crux of the class action lawsuit is that ChatGPT enables derivative works without paying or acknowledging the original copyrighted work. Legally, the right to authorise adaptations and reproductions of copyrighted work belongs to the human owner, which includes the making of a derivative work, unless it falls within the exceptions such as the fair use doctrine, educational purposes or can hold copyright in its own right.[40]

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[37] US Copyright Office, Report to The Librarian Of Congress By The Register Of Copyrights, 1966. Compendium of US Copyright Practices § 313.2.

[38] *Naruto v Slater*, No 16-15469 (9th Cir 2018).

[39] See, for example, Nicola Lucchi, 'ChatGPT: A Case Study on Copyright Challenges for Generative Artificial Intelligence Systems' (2024) 15(3) *European Journal of Risk Regulation* 602.

[40] UK Intellectual Property Office, 'Guidance: Exceptions to Copyright' (4 January 2021) https://www.gov.uk/guidance/exceptions-to-copyright.

An analysis of the case law highlights the US position on AI assisted and generated outputs since the US has had the most cases on copyright and AI. In *Thaler v Perlmutter* (2023),[41] Thaler owns a computer system with the name Creativity Machine, which generated a piece of visual art using AI. Thaler failed to register the artwork for copyright protection; he named the computer system as the author with the copyright to then be transferred to him as the owner of the Creativity Machine. The US Copyright Office refused to grant copyright on the basis that the work lacked human authorship. In *Zarya of the Dawn*, an artist created a comic book with self-written texts, but images generated using the Midjourney tool. The US Copyright Office held that literary authorship is protected by copyright, but the Midjourney-generated AI images in the work were not the product of human authorship and therefore not copyrightable. The US Copyright Office concluded that the images could not demonstrate human authorship, and the images were created entirely by Midjourney.[42] Most recently, in December 2023, the Review Board of the US Copyright Office considered Ankit Sahni's second request for reconsideration of the Office's refusal to register his two-dimensional artwork claim in the work titled SURYAST. The SURYAST painting was created by the AI application RAGHAV owned by Mr Sahni and is based on Vincent van Gogh's 'Starry Night'. After reviewing the application, deposit copy and relevant correspondence, along with the arguments in the second request for reconsideration, the US Copyright Office affirmed the original decision to deny SURYAST copyright registration on the legal reasoning of preceding case law.[43] In assessing the EU approach to copyright laws, the RAGHAV picture will be compared to 'Rembrandt 2.0', which was created by a Dutch company.

6. The EU Intellectual Property Office Approach to Copyright Law and AI-generated Works

The EU as a regional bloc co-ordinates IP law across Member States through regulations and directives. The main legal framework for copyright in the EU is the Copyright Directive.[44] With AI-generated works, the EU does not grant copyright ownership to AI-generated works, but it does grant copyright to AI-assisted work.[45] In contrast to the UK, the EU does not protect computer-generated works and has no equivalent provision to section 178 CDPA 1988. The EU has paved the way for AI

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[41] *Thaler v Perlmutter*, Civil Action No 22-1564 (BAH) 2023.

[42] United States Copyright Office, Zarya of the Dawn (Registration # VAu001480196) Letter to Van Lindberg (21 February 2023) https://copyright.gov/docs/zarya-of-the-dawn.pdf.

[43] Copyright Review Board, Second Request for Reconsideration for Refusal to Register SURYAST (SR # 1-11016599571; Correspondence ID: 1-5PR2XKJ) Letter to Alex P Garens (11 December 2023) https://www.copyright.gov/rulings-filings/review-board/docs/SURYAST.pdf.

[44] Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC.

[45] Bernt Hugenholtz and Joao Pedro Quintais, 'Copyright and Artificial Creation: Does EU Copyright Law Protect AI-Assisted Output?' (2021) 52 *International Review of Intellectual Property and Competition Law* 1190.

legislation and has agreed provisions for the EU AI Act. The Act is the first-ever EU legal framework that sets out harmonised rules that are placed on the market for the use of AI systems.[46]

The EU Copyright Directive has a four-step test for copyright protection where AI-assisted or generated systems are involved, in line with the EU Commission IP Action Plan.[47] Step 1 is the work itself and proof that it is a production in the literary, scientific or artistic domain. Step 2 requires human intellectual effort. Step 3 is satisfied when the author has made free and creative choices and the work bears their personal touch in relation to originality and creativity to equate to creative choice. Step 4 is the expression of the creative choices in the final output.[48]

The EU approach to AI-assisted work in copyright works can be analysed by its application to 'Rembrandt 2.0' and how it was created as a computer-generated artwork, yet was still considered an AI-assisted work and capable of copyright. The important question raised by 'Rembrandt 2.0' is on the ownership of the copyright and is a useful benchmark for the four-step AI copyright test. The aim of the work was not to utilise the AI systems randomly. In creating a simulation the AI systems were fulfilling a clearly defined purpose for the creative team. Algorithms were designed with traditional data analysis systems to create a digital artwork that followed Rembrandt's artistic style. The team, consisting of data scientists, engineers and art historians, analysed over 300 of Rembrandt's paintings and his techniques, style and subject matter. The team provided the instruction sets to produce the textures and layers necessary for 'Rembrandt 2.0' and transfer that knowledge into the software, which could generate the new work using the latest 3D printing technology.[49]

Applying the four-step test to 'Rembrandt 2.0', for step 1, the work is a digital painting and therefore fits the category of a production in the artistic domain. For step 2, the artwork has to demonstrate that it is a product of human intellectual effort, which would be the Rembrandt team of experts, and their effort; and step 4 is met by the expression of the output. Focusing then on step 3, we know AI can support the creative process, provided the originality test is met by a human. Copyright law has yet to develop a test that distinguishes between when the AI is a tool in the creative process or the decision-maker that meets the originality test. SURYAST failed to qualify for copyright protection in the US, whereas the Next Rembrandt meets the EU copyright test. This creates an opportunity to analyse and assess the existing tests and

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[46] Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence (AI Act).

[47] European Parliament resolution of 11 November 2021 on an intellectual property action plan to support the EU's recovery and resilience (2021/2007(INI)) https://www.europarl.europa.eu/doceo/document/TA-9-2021-0453_EN.html.

[48] Bernt Hugenholtz et al, 'Trends and developments in artificial intelligence – Challenges to the intellectual property rights framework – Final report' (Publications Office of the European Union, 2020) https://data.europa.eu/doi/10.2759/683128.

[49] Steve Schlackman, 'Who holds the Copyright in AI Created Art' *Art Journal* (29 September 2020).

decisions from the Global North and offer recommendations to develop new legal maxims that supports the economy whilst adhering to the needs of the local communities at large. All signatories to the WTO collectively adhere to international IP laws by way of WIPO. The purpose of making recommendations is to offer insight into Global South countries that have been identified by the Global Innovation Index (GII) as top ranked developing economies.[50] The GII 2024 identified Indonesia, India, Turkey, Mexico and China as top-ranked. For the purposes of this paper, China will be analysed in detail, given its recent AI-related case law and legislation.

7. Trailblazing Global South Countries – Spotlight on China

In terms of IP and AI, China has been the first country to grant copyright protection to AI-generated images. In *Li v Liu* in November 2023 the Beijing Internet Court recognised an AI-generated image as a copyright work in a case involving unauthorised reproduction. In this landmark case,[51] the Court held that the disputed AI-generated image case met the requirements of originality in accordance with Chinese copyright law. The judgment reflected the human author's original intellectual investment and was recognised as a work within the definition of copyright law and, as a result, protected by it. This is in stark contrast to the discussion earlier in this paper on the decisions by the US Copyright Office and the approach taken by the EU and UK IPOs. China has for the first time used judicial reasoning to allow AI-generated works to be legally acknowledged as part of the idea-–expression dichotomy. The Court held that the plaintiff directly set up the AI model and selected the picture involved. The picture was generated directly from the AI model due to the plaintiff's intellectual investment, and it reflects the plaintiff's personalised expression. Therefore, the plaintiff was acknowledged as the author of the picture and owns the copyright.[52]

Another pertinent question was answered by the Beijing Court when the plaintiff was advised he must prominently mark the AI technology or model used, in line with the principle of good faith and the need to protect the public right to know. In this case, the plaintiff used the hashtag '#AIillustration', which was sufficient to inform the public that the content was generated using AI. This diverges significantly from other international approaches to copyright law and the authorship of AI-created works. Where all jurisdictions do agree is that AI systems lack the personhood required for copyright authorship and subsequent protection.[53] Despite the Beijing Court ruling that there was copyright in the AI-generated work in *Li v Liu*, the authorship belongs

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[50] WIPO, 'Global Innovation Index 2024' https://www.wipo.int/web-publications/global-innovation-index-2024/en/.

[51] Beijing Internet Court Civil Judgment (2023) Jing 0491 Min Chu No 11279.

[52] Aaron Wininger, 'Beijing Internet Court Releases Translation of Li vs. Liu Recognizing Copyright in Generative AI' China IP Law Update (22 January 2024).

[53] Mackenzie Caldwell, 'What Is an "Author"? Copyright Authorship of AI Art Through a Philosophical Lens' (2021) 61(2) *Houston Law Review* 411.

to Mr Liu with sufficient declaration of the work being AI-generated.[54] Accessing judgments in China can be tricky, and despite the Chinese Internet Court aiming for more transparency in its decisions, public documents on full judgments with judicial reasoning are not easily accessible.[55]

China has been steadily developing its regulations and policies around AI systems, first with its AI Interim Measures[56] and then subsequent case law, further cementing China's image as being AI-friendly in copyright law judicial decisions.[57] In China's first copyright infringement case on AI-generated content (AIGC) outputs, *Shanghai Character License Administrative Co, Ltd v TAB*,[58] the Court found the defendant, a text-to-image AIGC provider, liable for infringing the copyright works belonging to Ultraman. The Court incorporated China's first AI regulation (the AI Interim Measures) into its decisions, and found that the defendant failed to exercise reasonable duty of care in generating its AIGC output, violating the AI Interim Measures.[59] China's approach has been dubbed tech-friendly and supportive of AI-generated copyrightable works, whereas the US, EU and UK judicial decisions are seen as more conservative in their approach.[60] However, on closer inspection, it is still evident that China is not that radical given the authorship is still with the human author and it is the interpretation of the originality from the human author that is at the discretion of the courts. It can be argued that the Chinese courts are reducing the human involvement required to demonstrate sufficient originality to satisfy the test for copyright protection. Therefore, the elephant in the AI and copyright room is that jurisdictions are trying to construct provisions for AI systems in what was, up until very recently, a human-author-based copyright legal system. AI measures, an AI Act and case law will all fall short of achieving an AI-copyright ecosystem that is fair and balanced as there now needs to be a tiered system when dealing with AI.

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[54] Christopher Savage and James Rosenfeld, 'Diverging International Approaches to the Copyrightability and Authorship of AI-created Works, Insights Intellectual Property Litigation' (Davis Wright Tremaine LLP, 2024).
[55] Yiming Wang and He Tian, 'Development of Contemporary China's Judicial Openness System' in Yiming Wang and He Tian, *Judicial Transparency in China* (Springer, 2023) 15–37 https://doi.org/10.1007/978-981-19-7822-7_2.
[56] Amy Yang and Bob Li, 'AI Watch: Global regulatory tracker – China' White & Case (2025).
[57] Keith Kelly and Zach Dai, 'Computer Love: Beijing Court Finds AI-Generated Image is Copyrightable in Split with United States' Art Law Blog (Sheppard Mullin, 2023). https://www.artlawgallery.com/2023/12/articles/artificial-intelligence/computer-love-beijing-court-finds-ai-generated-image-is-copyrightable-in-split-with-united-states.
[58] *Shanghai Character License Administrative Co, Ltd v TAB* (2024) Guangzhou Internet Court (2024) Yue 0192 Min Chu 113 (2024粤0192初113号).
[59] Seagull Song and Wang Mo, 'China's First Case on AIGC Output Infringement—Ultraman' (King and Woods Malleson, 24 February 2024) https://www.kwm.com/cn/en/insights/latest-thinking/china-s-first-case-on-aigc-output-infringement-ultraman.html.
[60] Peter K. Yu, 'The Future Path of Artificial Intelligence and Copyright Law in the Asian Pacific' (2024) 96 *Computers and Law* https://ssrn.com/abstract=4707592.

8. Recommendations for an AI-copyright Ecosystem

At the outset, it is imperative to ascertain what an AI-copyright ecosystem seeks to protect and safeguard versus what would sit outside of the remit. AI-generated works for copyright purposes need to be clearly legally defined. AI systems can now talk to each other and create potentially copyrightable work without even a prompt from a human author.[61] This would challenge even the most tech-friendly courts in the world as, if the human author is not involved at any stage of the creation of the work, there would be no legal basis to award human authorship. The UK has specific provisions for CGWs[62] but, as yet, no such provision for AI systems to create their own copyright. The rationale behind recommendations for a regulated AI-copyright ecosystem is based on the need to create legal parameters for AI systems. Recent experiments have demonstrated how AI systems can communicate with each other, and a team at Urbana-Champaign were able to demonstrate how several large language models (LLMs) can compromise vulnerable websites without human guidance.[63] The UNIGE team from the University of Geneva developed an AI capable of learning a task solely based on verbal instructions and to then communicate with a sister AI.[64] WIPO runs a series of conversations on IP and frontier technologies with the key question of whether an AI output should be protected by IP.[65] This paper argues that this is the wrong question. The legal analysis of existing case law and the new measures being introduced from different jurisdictions across the world bring to the fore the more accurate question: how can an AI output be protected by IP fairly, with the necessary checks and balances, due diligence and trustworthiness measures to effectively support the IP ecosystem?[66]

The TRIPS agreement sets out the required minimum level of consistent uniform standards at an international level. An impactful outcome of the WIPO conversations on frontier technologies is to now design and implement TRAIIPS. WIPO can lead through a taskforce that assesses national approaches and develops international-

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[61] Alexandre Pouget and Reidar Riveland, 'Two artificial intelligences talk to each other' UNIGE Press Release (Université De Genève, 2024).

[62] IPO, 'Consultation outcome: Artificial intelligence call for views: copyright and related rights' (updated 23 March 2021) discussed how 'the UK protects computer-generated works which do not have a human creator (s178 CDPA). The [CDPA] designates the author of such a work as "the person by whom the arrangements necessary for the creation of the work are undertaken" (s9(3) CDPA). Protection lasts for 50 years from the date the work is made (s12(7) CDPA).'

[63] Thomas Claburn, 'How to weaponize LLMs to auto-hijack websites' The Register (17 February 2024) https://www.theregister.com/2024/02/17/ai_models_weaponized.

[64] Pouget and Riveland (n 61).

[65] WIPO, 'Generative AI Navigating intellectual property' Factsheet, (2024). The document was prepared by WIPO's IP and Frontier Technologies Division, drawing on commissioned work by Matt Hervey (Growling WLG, UK).

[66] For decided cases on AI outputs and IP protection, see for example the DABUS case (*Thaler v Comptroller General of Patents Trademarks and Designs* [2021] EWCA Civ 1374) that was filed in several jurisdictions, including the UK, and failed. The case related to recognition of DABUS as the inventor under patent law and was unsuccessful as an AI cannot be recognised as the inventor and highlights the need for new standards in the regulation of AI outputs.

level standards via the TRIPS agreement for a supplementary TRAIIPS provision. It can reflect the ethos of TRIPS and incorporate staggered grace periods dependent upon individual states' socio-political conditions and whether they are a developed or developing country. A copyright and AI framework is needed to map specific criteria, and technical knowledge of AI systems where AI is generating copyrightable works.[67] The duration periods will require careful examination to reflect the speed at which AI can create. Granting human authorship the current duration-length of copyright protection created by AI generated works can lead to an absurdity in the law that brings into question the entire validity of copyright laws, as they are essentially designed for human beings. AI now requires its own supplementary provision with legal rules on authorship, how the test for the idea–expression dichotomy applies to AI, the duration of copyright protection and liabilities in the event of copyright infringement. TRAIIPS can safeguard the interests of human authors of copyright, reassess duration periods for copyright protection and create parameters for competitors and potential AI-related copyright infringement, while simultaneously addressing the legal challenges posed by AI systems.

AI certifications and implementation procedures can act as an overarching implementation strategy.[68] The certifications are important as there needs to be an independent governmental and international control mechanism on professional standards for trustworthy AI.[69] There is a need for legislative changes and updates to address the challenges and opportunities to copyright laws from AI-generated works. WIPO can play a pivotal role of international collaboration and policy development in spearheading a novel AI-copyright system. There are unique provisions that are required for TRAIIPS that can be distinguished from TRIPS. First, it is the copyright issues on the data itself that AI systems, like ChatGPT, use to train and develop, and how the increasing use of synthetic data to train AI models may affect the ecosystem.[70] Current case law on copyright and AI-generated works is too narrow as it only deals with the question of whether AI-generated works can be copyrightable, but the AI industry requires robust and accurate regulation standards on the licensing

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[67] Hafiz Gaffar and Saleh Al-Barashdi, 'Copyright Protection for AI-Generated Works: Exploring Originality and Ownership in a Digital Landscape' (2025) 15(1) *Asian Journal of International Law* 23.

[68] NATO, 'Emerging and disruptive technologies' (updated 8 August 2024) https://www.nato.int/cps/en/natohq/topics_184303.htm.

[69] Centre for Data Ethics and Innovation, 'The roadmap to an effective AI assurance ecosystem – extended version' Independent report (8 December 2021) https://www.gov.uk/government/publications/the-roadmap-to-an-effective-ai-assurance-ecosystem.

[70] UK Intellectual Property Office, Closed consultation: Copyright and AI: Consultation (2024). Presented to Parliament by the Secretary of State for Science, Innovation and Technology by Command of His Majesty. Published online 2024: https://www.gov.uk/government/consultations/copyright-and-artificial-intelligence/copyright-and-artificial-intelligence#:~:text=Giving%20right%20holders%20the%20ability,then%20this%20would%20infringe%20copyright.

and permissions available to it when creating potential copyrightable work. The case law essentially deals with surface-level IP issues, and TRAIIPS can address the shortcomings in the current approach by creating more transparency between the AI system developers and the creators through implementation strategies and AI certifications. For AI developers, these will be the first-ever trade-related minimum standards at an international level, and for national IP legislators, it will be a supplementary provision to complement existing TRIPS standards. TRAIIPS can offer standards on a myriad of issues, such as authorship, duration of protection, identification, purpose, intention, transparency, privacy, licences, AI certifications, infringement, duty of care, exemptions and fair dealing. Further, the AI and IP standards can address issues of authorised and unauthorised use of copyright works, derivative works, economic rights, moral rights, limitations, income-based data sharing agreements, royalty structures and approaches to AI training data. Further research is needed to establish a tiered approach to TRAIIPS with rights and obligations for AI developers, creators and users of AI systems through informed and consistent legislative reform.

9. Conclusion

AI-assisted creativity and innovation is accepted as an assistive tool in the idea–expression dichotomy where the authorship of the copyrightable work belongs to the human author.[71] Once the attention turns to AI-generated works, there are several contentious issues as to whether AI and its outputs should and can be protected, and, if they can, how they should be protected under existing copyright laws given the very crucial fact that AI systems lack personhood.[72] The concept of stimulating creation and innovation through a rewarding system is not suitable for AI as machines would actively produce creative outputs without any rewarding purpose.[73]

This paper has examined the legal challenges to copyright law posed by using AI-generated systems and has considered the EU's legislative measures,[74] and the approaches of the US and the UK, as well as China.[75] There is now a plethora of case law across all the major IP leading jurisdictions which, despite their differing approaches, all highlight one common theme: that the current laws and regulations on copyright law need to be overhauled to reflect the impact of AI systems.[76] Rather

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[71] Jyh-An Lee, Reto Hilty and Kung-Chung Liu (eds), 'Artificial Intelligence & Intellectual Property' (Oxford University Press, 2020); Max Planck Institute for Innovation & Competition Research Paper No 20-02 https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3539406.
[72] Caldwell (n 53).
[73] Naim and Yun Chan (n 8).
[74] João P Quintais, 'Generative AI, Copyright and the AI Act' Kluwer Copyright Blog (2023) https://copyrightblog.kluweriplaw.com/2023/05/09/generative-ai-copyright-and-the-ai-act.
[75] Alesia Zhuk, 'Navigating the legal landscape of AI copyright: a comparative analysis of EU, US, and Chinese approaches' (2024) 4 *AI Ethics* 1299 https://doi.org/10.1007/s43681-023-00299-0.
[76] Edward Scott, 'Copyright and artificial intelligence: Impact on creative industries' (House of Lords Library, 2025) https://lordslibrary.parliament.uk/copyright-and-artificial-intelligence-

than each jurisdiction creating national laws ahead of international standards, this paper contends that international standard-setting from WIPO and WTO needs to take the lead on minimum standards, to offer the necessary consistency and accuracy to guide national and regional legislative reform.[77]

The EU is a global leader on AI law and regulation as the EU AI Act offers detailed provisions for AI use, security and risk management.[78] As noted earlier, the EU AI Act does not legislate on intellectual property rights and does not provide any specific provisions. But it does provide the foundation of AI law, from which an AI copyright system can be developed, aligning to the core principles of regulation, risk, management and human oversight. The relationship between the human author and the AI system is established for AI-assisted copyrightable works and the focus of this research paper is on the future of copyright law and AI-generated works. The recommendation is for a TRAIIPS taskforce led by WIPO and WTO with key signatory countries offering additional provisions that supplement the existing TRIPS standards, as minimum levels of IP compliance to meet membership obligations. By building on the existing provisions of the EU AI Act, the EU can lead on model laws for AI and IP, working alongside the WIPO taskforce.

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impact-on-creative-
industries/#:~:text=Currently%2C%20developers%20are%20subject%20to,material%20used%20
for%20training%20AI.

[77] Emmanuelle Ganne, Lauro Locks and Ankai Xu, 'Trading with intelligence How AI shapes and is shaped by international trade' (WTO, 2024). The report was prepared under the general responsibility and guidance of Johanna Hill, WTO Deputy Director-General, and Ralph Ossa, Director of the Economic Research and Statistics Division.

[78] Oskar J Gstrein et al, 'General-purpose AI regulation and the European Union AI Act' (2024) 13(3) *Internet Policy Review* https://doi.org/10.14763/2024.3.1790.