

OWNERSHIP OF COPYRIGHT IN WORKS OF ARTIFICIAL INTELLIGENCE: NEED FOR A LEGAL FRAMEWORK

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Abstract

Technological advancements and access to computing power has made it possible for machines to artificially perceive, think, understand, learn, produce and interact without explicit human programming. This new reality known as artificial intelligence was introduced by the English mathematician Alan Turing in 1950 and later coined by an American computer scientist John McCarthy during the Dartmouth Conference in 1956. This new reality has brought with it various legal and philosophical complexities bordering on copyright ownership. These challenges stem from the fact that extant laws and legal systems on copyright were built on the presumption that there is some form of human intervention. It becomes imperative to solve the problem of the ownership of copyright content created by machines. This includes establishing a legal framework for the purposes of some form of regulatory intervention in respect of regulating Artificial Intelligence. It is further suggested that where there is an artificial intelligence infringement on copyright, a human-based “smoking gun” is a prerequisite for liability and appropriate remedy. The approach adopted is analytical and comparative.

KEY WORDS: artificial intelligence, copyright, ownership, liabilities.

1. Introduction

Russell and Norvig refer to artificial intelligence (AI) as the “study of agents that exist in an environment and perceive and act”.¹ Schalkoff on the other hand defined it as “a field of study that seeks to explain and emulate intelligent behaviour in terms of computational processes.”² Schalkoff’s definition seems preferable as it highlights the importance of emulation and behaviour.³ This is closely linked to the impressive technological progress especially the ability of machines which according to Boyle “perform activities which used to be typically and exclusively

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¹ SJ Russell and P Norvig, *Artificial Intelligence: A Modern Approach* (Pearson, 3rd edn, 2010) 1

² R Schalkoff, *Artificial Intelligence: An Engineering Approach* (McGraw-Hill, 1990) 2

³ RM Allardini, *et al*, ‘AI-Generated Content: Authorship and Inventorship in the Age of Artificial Intelligence’ (2018), <<https://www.cs.helsinki.fi/u/ttonteri/pub/aicontent2018.pdf>> accessed 28 February, 2020.

human”, as well as to develop “certain autonomous and cognitive features – e.g. the ability to learn from experience and take quasi-independent decisions.”⁴ Russell and Norvig further organised the range of definitions of artificial intelligence into four approaches – thinking humanly, thinking rationally, acting humanly and acting rationally.⁵

The above definitions underscore the point that Artificial intelligence has resulted in the creation of a machine that could analyse data, think, speak, recognise, make independent decisions, solve complex problems, learn, even feel and react without any human help.⁶ This concept is traceable to Alan Turing, who in 1950 proposed the Turing Test for calling a machine intelligent: a machine could be said to think if a human interlocutor could not tell it apart from another human.⁷ Six years later in 1956 at a conference at Dartmouth College, New Hampshire, USA to investigate how machines could simulate intelligence, Professor John McCarthy coined the word ‘artificial intelligence’ to help people to understand whether machines can truly think. Since then, there have been advances in search algorithms, machine learning algorithms, and integrating statistical analysis into understanding the world at large over the past six decades.⁸

Today, the concept has gradually taken over the functions reserved exclusively for humans, leading to different perceptions and changes in human interaction.⁹ These changes pervade not only the financial sector but also in the legal. Intellectual property rights, competition law, labour law, criminal law, tort law, data protection law, are also among the different areas affected by artificial intelligence. All these areas of endeavour involve the interaction among different arrays of products and services, thus creating so many legal issues.

These issues border on the determination of who will own what rights in the "output" of such programmes and becomes very relevant considering the fact that

⁴J Boyle, “Endowed by their Creator? The Future of Constitutional Personhood”, Governance Studies at Brookings (9 March 2011) 5

⁵*Ibid*, note 1, p. 2.

⁶M Krzysnik, (2019). “The Legal Challenges of Artificial Intelligence” (22 January 2019), available on <https://www.iuricorn.com/the-legal-challenges-of-artificial-intelligence/>, (last accessed 10 February 2020).

⁷A Turing, *Computing Machinery and Intelligence*, (Mind, October 1950), in R Kemp, “Legal Aspects of Artificial Intelligence.” *Kemp IT Law*, v. 2.0, (2018)1.

⁸Smith, *et al*, “The History of Artificial Intelligence” *History of Computing CSEP 590A*, University of Washington, 2006 ,4.

⁹JPD Lenardon, “The Regulation of Artificial Intelligence” (2017), A Master’s Thesis Submitted to the Tilburg Institute for Law, Technology and Society LLM Law and Technology.,10.

software is copyrightable.¹⁰ Before now copyright law had excluded utilitarian works that is, works that had functions beyond the conveying of information or the displaying of some sort of appearance-from its domain.¹¹ Of the wide diversity of copyrightable works, only software is capable of the copyright framework, to ask who the author of a computer generated work is to ask who has ownership rights in it.

In resolving the issue of copyright ownership, computer-generated works problems may require interpretations from courts to settle what constitutes the utilitarian quality of software.¹² This is because within the framework of the copyright law, ownership rights depend initially on "authorship."¹³ This buttresses the fact that intellectual property laws clearly defines what constitutes ownership of a physical embodiment of the copyrighted work and ownership of an intellectual property interest in it.¹⁴ Therefore, one may be the owner of a copy of a book or sculpture without having any intellectual property rights in the copyright.

The work is thus a reflection of the advanced state of the debate on the ownership of copyrights of artificial intelligence works. It is argued that some of the extant laws on the subject matter are too limited in scope and thus face the challenge of conceptual ambiguity and lack of enforcement mechanisms. It is as a result that this paper critically examines the status quo of artificial intelligence (AI) governance.

¹⁰ Although there have been numerous challenges to the copyrightability of computer programmes, see, *Data Cash Sys., Inc. v JS&A Group, Inc.*, 480 F. Supp. 1063 (N.D. Ill. 1979), *aff'd on other grounds*, 628 F.2d 1038 (7th Cir. 1980), it is now generally accepted that computer programmes are proper subject matter for copyright. See, *Apple Computer, Inc. v. Formula Int'l, Inc.*, 725 F.2d 521 (9th Cir. 1984); *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240 (3d Cir. 1983).

¹¹ This principle is codified in the copyright statute at 17 U.S.C. § 101 (1982).

¹² Courts have tended to downplay or ignore the utilitarian character of software in cases which have raised the issue in the past. See *Apple Computer, Inc. v. Franklin Computer Corp.*, 545 F. Supp. 812, 823-24 (E.D. Pa. 1982), *rev'd*, 714 F.2d 1240, 1250-53 (3d Cir. 1983), *cert. dismissed per stipulation*, 464 U.S. 1033 (1984). As the Office of Technology Assessment (OTA) Report indicates, the functional character of software is creating severe doctrinal problems in application of doctrine to software copyright cases. See U.S. Congress, OTA, *Intellectual Property Rights in an Age of Electronics and Information* 69-73 (1986) [hereinafter cited as OTA REPORT].

¹³ See United States Copyright Act, 17 U.S.C. § 102(a) (1982) provides that "Copyright protection subsists . . . in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. See also the Copyright Act, Cap C28 *Laws of the Federation of Nigeria (LFN)* 2004 s. 1.

¹⁴ *Ibid*, s.202.

In doing so, it highlights the importance of considering who is driving AI governance and evokes outstanding questions regarding what good AI framework should look like. These questions are currently pervading different legal and political institutions across the globe, including the United Kingdom (UK),¹⁵ South Korea,¹⁶ the Indian,¹⁷ Mexico,¹⁸ Europe,¹⁹ as well as Nigeria.²⁰ This work hopes to contribute to shaping these debates.

2. Authorship/Ownership of Copyrights of Artificial Intelligence

Copyright is a legal right granted to the creator of an original work of art, allowing him/her exclusive rights for its use and distribution.²¹ Zimmerman²² opines that the rationale behind this exclusiveness granted to the creator of a work is due to the fact that the author is an originator merged with Locke's economic theory of possessive individualism. Tripathi and Ghatak²³ state that for a grant of a copyright to be complete, two essential features are required.²⁴ Firstly, the work should be in

¹⁵See the House of Commons, (2017). "Algorithms in decision-making." House of Commons Science and Technology Committee, available on: <https://publications.parliament.uk/pa/cm201719/cmselect/cmsctech/351/351.pdf>, (last accessed February 19, 2020).

¹⁶Korea Times.(2018). "Korea to nurture Artificial Intelligence, robot as new cash cow" available on https://www.koreatimes.co.kr/www/news/biz/2016/10/123_217161.html, (last accessed February 20, 2020).

¹⁷Times of India, (2018). "NITI Aayog releases Strategy on Artificial Intelligence, identifies 5 focus areas." Available on http://timesofindia.indiatimes.com/articleshow/64452469.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst, (last accessed February 20, 2020).

¹⁸Mexican Government, (2018). "Estrategia de Inteligencia Artificial MX 2018" available <https://datos.gob.mx/blog/estrategia-de-inteligencia-artificial-mx-2018?category=noticias&tag=nula>, (last accessed February 20, 2020).

¹⁹European Commission, (2018). "Artificial Intelligence: Commission outlines a European Approach to boost Investment and set ethical Guidelines." Available on http://europa.eu/rapid/press-release_IP-18-3362_en.htm, (last accessed February 20, 2020).

²⁰N Alajemba and C James, (2018). "Nigeria to Set up New Agency for Robotics and Artificial Intelligence", *TEDGE NEWS* (Aug. 6), <https://itedgenews.ng/2018/08/06/nigeria-set-new-agency-robotics-artificialintelligence/>, archived at <https://perma.cc/H2MF-GS4B>, (last accessed February 20, 2020).

²¹Tripathi and Ghatak, *op.cit*, note 15. 86.

²²L Zimmerman, (2005). "It's an Original!(!): In Pursuit of Copyright's Elusive Essence", 28 *COLM. J. L. & ARTS* 187, 194.

²³S Tripathi and C Ghatak, (2017). "Artificial Intelligence and Intellectual Property Law", *Christ University Law Journal*, Vol. 7, No. 1, p.83.

²⁴*Ibid*, p.86.

a tangible form, and secondly, it should be original.²⁵ A copyright is exercised generally for literary and artistic works. Since one of the contemporary areas of AI's applicability is creation of literary works, the study of copyright in the light of AIs, becomes relevant.²⁶ The cases analysed at the footnote tried to clear the ambiguities inherent in artificial intelligence systems but lacks of definitive stance which still affects the prospective right holders.

Authors of a work of art are the focal point of any discourse on copyright law and are generally justified under three theories.²⁷ According to the labour theory developed by Locke, the intellectual labour of the author mixed with other resources justifies the author's right over the fruit of their labour.²⁸ Locke's theory was criticised based on the fact that the "sweat of the brow" doctrine did not extend copyright protection to factual information.²⁹ The personality theory by Hegel claims that a work belongs to or reflects the personality of their creator.³⁰ Although, the utilitarian theory starts with the welfare of the public and the society as a whole, the fact that the copyright is considered as an incentive for the authors to create

²⁵ See *Burrow Gilles Lithographic Co. v. Sarony*, 111 U.S. 53 (1884). This case addressed the dichotomy between creative and mechanical labour. The Court discussed the possibility of granting copyright protection to a product which is the output of a machine. The Court, by holding that purely mechanical labour is *per se* not creative, narrowed the scope of their protection.

²⁶ Confer *Bleistein v. Donaldson Lithographing*, 188 U.S. 239 (1903) In this case, the court clearly differentiated between a human's work and something artificial. The Court made its stance clear by using the words 'something irreducible, which is one man's alone' which meant that there was no scope for anything that was not a product of man's creativity; Confer *Alfred Bell & Co. v. Catalda Fine Arts*, 191 F.2d 99 (2d Cir. 1951) where the court lowered the standard for originality and held that the work to be original, it must not be copied from any other artistic work of similar character. The Court further held that unintentional or accidental variations may be claimed by an author as his or her own.

²⁷ Moore, Adam, (2011). "Intellectual Property", *The Stanford Encyclopaedia of Philosophy*, Edward N. Zalta (ed.)

²⁸ In Locke's words, man is a "proprietor of his own person." See Locke, (2003). "Rehabilitating Locke: The Labour Justification of Copyright", available on <http://www.copyright.com/2012/03/rehabilitating-locke-the-labor-justification-of-copyright/>, (last accessed on February 28, 2019).

²⁹ In the US Supreme Court's 1991 decision in *Feist Publications v. Rural Telephone Service*. The Court held that the "sweat of the brow" doctrine did not extend copyright protection to factual information — the original publisher of the telephone directory could not claim copyright protection over its collection of telephone numbers merely because it had expended labour compiling them.

³⁰ This theory embraces the view that expressive works are the extension of one's self and thus are deserving of protection because of an individual's inherent dignity.

cannot be denied.³¹ This theory has also been criticised for not being static.³² The question that still bugs the mind is: who should be conceived as the author of a work?

Although the term ‘author’ is often mentioned and used in the text of the Berne Convention, it is not explicitly defined.³³ Ricketson explains that the reason for the inexplicit definition of authorship was due to a mutual understanding between member states, so there was no need for further interpretation.³⁴ In line with the above explanation, Ballardini *et al*³⁵ opines that while member states may determine what constitutes an author, however, common law systems traditionally emphasise the degree of skill and labour involved, while continental law countries tend to put more weight on the level of creativity. Indeed, this issue may also indirectly concern questions of whether it is necessary for an author to be a natural or a juridical person.³⁶ At the same time, however, the Berne Convention indirectly specifies one concept of author by stipulating that if the author’s name is indicated, they shall be regarded as the author of a literary or artistic work in the absence of proof to the contrary.³⁷ Rather than defining the author, though, this rule aims at offering some certainty and reducing the burden of proof for right holders.

This, in no way, solves the debate on the authorship of artificial intelligence. Before now, the authorship or ownership of copyrightable works which are computer-generated was not in doubt. The popular belief is that since a computer is a man-made invention, it is deemed as a tool in the hand of a human creator, consequently

³¹ Society benefits from the production of creative works. But in the absence of legal protection, creative production tends to be inefficient since costs of creation are high while costs of copying and distribution are low.

³² As with the utilitarian justification of copyright, rights-based theories are not static. Recent works by Abraham Drassinower, for example, presents a rights-based justification of copyright that conceives works as communicative acts.

³³ Berne Convention for the Protection of Literary and Artistic Works as amended on September 28, 1979. Article 2(6) lays down that protection under the Convention is to operate for the benefit of the author and his successors in title. For some categories of works, however, such as cinematographic works (Article 14bis), ownership of copyright is a matter for legislation in the country where protection is claimed.

³⁴ *Ibid.*

³⁵ RM Allardini, *et al*, (2018). “AI-Generated Content: Authorship and Inventorship in the Age of Artificial Intelligence” available on <https://www.cs.helsinki.fi/u/ttonteri/pub/aicontent2018.pdf>, (last accessed February 28, 2020).

³⁶ S Ricketson and JC Ginsburg. (2005). *International Copyright and Neighbouring Rights: The Berne Convention and Beyond* (2nd edn volume 1, OUP), pp. 359-60.

³⁷ *Ibid.*

authorship of the resultant work would belong to the human creator.³⁸ The current impact of AI is starting to disrupt this seemingly rigid traditional presumption.³⁹ This impact has also raised fundamental issues as to who owns the copyright of artificial intelligence works. There are divergent views on the point. The current position of copyright legislations worldwide is that human authorship is an indispensable requirement for copyright protection.⁴⁰ Most copyright jurisdictions across the world only recognise natural persons and registered corporations as authors who are entitled to appropriate both economic and moral rights over the created work.⁴¹ In England for instance, the Copyright Design and Patent Act makes provision for computer-generated works.⁴² It provides that the author of a computer-generated work is the person by whom the arrangements for the creation of the work were undertaken. Section 9 (3) of the Act further grants the author 50 years protection but does not include moral rights. In New Zealand, copyrights on works made by machines, belong to "whoever has undertaken the necessary provisions for the creation of the work."⁴³ In other words, copyright in such work will not be conferred on the machine/AI but on the person who created the machine. Under the U.S. copyright law, an author of an artificial intelligence work may have legal claims over the resulting creation if he cites the AI programme as a tool or medium used in the creative process.⁴⁴ This was illustrated in *Burrow-Giles Lithographic Co. v Sarony* (*supra*) which first extended copyright protection to photography.⁴⁵ The camera used to capture the image of writer Oscar Wilde by photographer Napoleon Sarony was considered by the court as a tool which aided the "author" in creating "an original work of art."⁴⁶ In Nigeria, copyright is conferred only on a qualified person i.e. an individual who is a citizen of or who is domiciled in Nigeria or an incorporated entity registered under Nigerian

³⁸O Mayowa, (2020). "Nigeria: Who owns the Copyright in an AI Invention?" available at: <https://www.mondaq.com/Nigeria/Intellectual-Property/881214/Who-Owns-The-Copyright-In-An-AI-Invention>, (last accessed February 11, 2020).

³⁹A Viswanath, "Intellectual Property and Artificial Intelligence" available on <http://www.mondaq.com/india/x/852186/Patent/INTELLECTUAL+PROPERTY+AND+ARTIFICIAL> (accessed January 31st, 2020).

⁴⁰*Ibid.*

⁴¹Copyright Act of Nigeria, s. 1.

⁴²Copyright Design and Patent Act 1988 of the United Kingdom, s. 9 (3).

⁴³Copyright Act 1994 New Zealand, s. 5 (2) (a).

⁴⁴*Burrow-Giles Lithographic Co. v. Sarony*, 111 U.S. 53 (1884).

⁴⁵*Ibid.*, p. 60.

⁴⁶By virtue of 17 U.S.C. § 106A (2012), legal protection for all photographs was eventually made a part of the U.S. Copyright Act; See K Hristov, "Artificial Intelligence and the Copyright Dilemma", 53 (3), p. 435.

law.⁴⁷ Although the Nigerian Copyright Act makes no reference to computer-generated works, it can be deduced from the Act that only humans are capable of owning copyright over a work. Therefore, where a work is created by a machine in Nigeria, the copyright in that work will be conferred on the human inventor or programmer.

There is always a human input in the creativity process, no matter how minute, and although such human agent may not contribute to the actual creative or expressive form, he or she often predicts the end-result of the activity. Therefore, since the creative process of AI works are usually initiated by a human, it suffices to say that the copyright in the work should belong to the human creator. Furthermore, one of the major incentives for investments in the research and development of AI is the acquisition of proprietary rights in the eventual outputs of the AI.⁴⁸

The position of the law that only humans can own copyright was strongly affirmed by the US Court of Appeal in the notorious "Monkey Selfie" case.⁴⁹ In that case, a UK Wildlife photographer, David Slater had in July 2011, visited a wildlife park in Indonesia to take unique pictures of some rare macaque monkeys. At some point, he intentionally left his camera on a tripod for the monkeys to explore as they seemed curious. One of the monkeys named Naruto, took the camera and snapped "selfies" of itself.⁵⁰ David Slater then went on to print and publish several copies of the pictures. An animal rights group, People for the Ethical Treatment of Animals (PETA) sued Slater in 2015 on behalf of Naruto for copyright infringement. The Ninth Circuit Court of Appeals upholding the judgment of the lower Court dismissed the appeal by PETA and held that copyright protection cannot be granted to animals, being a non-human entity.⁵¹

The position above has been heavily criticised by some commentators. For instance, Simon Colton, who is the creator of "The Painting Fool", an AI which paints excellently well believes that artificial intelligence should be accorded authorship

⁴⁷Copyright Act 2004, s. 2(1)

⁴⁸*Ibid*, note 42.

⁴⁹ See *Naruto v. Slater*, No. 16-15469 (9th Cir. 2018).

⁵⁰ A Guadamuz, "Can the Monkey-selfie case teach us anything about Copyright Law?" (2018) https://www.wipo.int/wipo_magazine/en/2018/01/article_0007.html, (Last accessed on 26 February 2020).

⁵¹ The case clearly reinforces the general rule that non-human entities such as AI and other machines, are not entitled to copyright protection.

over the creations it makes.⁵² According to him, "If artificial intelligence is not the material owner of the fruit of its work, then it will never be more than a tool, a means of production, that software is taken seriously as a creative entity is the ultimate goal of computer creativity".⁵³ Agitations are also sprouting at different levels on the need to revisit the global intellectual property law regime in view of the need to attribute copyright or other intellectual property rights (IPRs) to the rightful inventor or creator – the AI! An international team led by professor Ryan Abbott of the University of Surrey United Kingdom filed patent applications in the US, UK and the European Patent Office naming the AI system as the sole inventor.⁵⁴

It is also worthy of note that on 20 January 2015, the European Union formed a committee on legal issues related to the evolution of robotics and artificial intelligence. The committee proposed some Civil Law rules which were intended to guarantee the legal status of robots, which are granted the status of "electronic persons". The proposal stated that "the most sophisticated autonomous robots could receive the status of an electronic person, with specific rights and obligations, including amending damages they cause".⁵⁵ It would seem reasonable to argue that the author of an artificial intelligence system could be a natural or legal person, because both can exhibit their names on the work. This means that "authorship" of artificial intelligence works should be redefined to include both human and non-human authors. Professor Ryan and Colin Davies⁵⁶ argue that assigning inventorship and authorship to non-humans is an innovative new way to encourage AI growth and development. In theory, this could prevent works independently created by AI machines from falling into the public domain and offer the programmers and companies behind these machines some exclusivity to the

⁵²Colton et al, *Painting Fool Sees! New Projects with the Automated Painter*. (2015)(ICCC), pp. 189-196.

⁵³L Butler, "World first Patent Applications filed for Inventions generated solely by Artificial Intelligence" available on: <https://www.surrey.ac.uk/news/world-first-patent-applications-filed-inventions-generated-solely-artificial-intelligence>, (last accessed 30 January 2020).

⁵⁴Ibid, note 42.

⁵⁵M Diaz, "Artificial Intelligence and Copyright", available on <https://www.lexology.com/library/detail.aspx?g=ab3340fa-57e5-4145-afe9-110b088c9e36>, (last accessed February 20, 2020).

⁵⁶CR Davies and R Abbot have (independently) both argued that computers should be considered legal authors/inventors under relevant IP law. See R. Abbott, "I Think, Therefore I Invent: Creative Computers and the Future of Patent Law", 57 *B.C. L. REV.* 1079 (2016); C. R. Davis, An Evolutionary Step in Intellectual Property Rights—Artificial Intelligence and Intellectual Property, 27 *Computer L. & Security Rev.* 601 (2011).

resulting copyrightable works. This theoretical solution, however, is controversial and could lead to an uncertain future full of legal challenges and systemic abuse. Non-humans do not have legal personality and may not be held legally responsible in a court of law.⁵⁷

3. Liabilities of Copyright of Artificial Intelligence

Liability refers “to a duty or obligation arising from an express or implied contract or other legal relationship”⁵⁸ and assumes different variations. Liability can be personal or vicarious. Andoulsi and Petra⁵⁹ argue that liability can be deemed vicarious in situations where “the duty of care is held by a party other than the one directly connected to the party harmed, as in the case of an employer who is liable for acts of their employee.” These liabilities which can be criminal or civil⁶⁰ apply in all jurisdictions including the USA, the UK and Nigeria.

On the liability of artificial intelligence, Nimmer⁶¹ argues that its liability arises under three situations, viz: when remote parties such as a manufacturer and a consumer are connected by virtue of the sale of a product; when two parties are in a direct contractual relationship; and when the user relies on information supplied by the computer system.⁶² Stretching Nimmer’s argument further, Gerstner argues that the first scenario as put forward by Nimmer considers negligence and strict liability under tort law. However, breach of warranties, both express and implied, falls within both the first and the second scenarios as created by Nimmer. The third scenario again deals with negligence.⁶³

⁵⁷ The courts have decided that have no legal standing in front of the law, thus being absolved of all legal rights and responsibilities within each case. See *Naruto v. Slater*, (2016) U.S. Dist. Lexis 11041 (N. D. Cal. Jan. 23, 2016); *People v. Frazier*, 173 Cal. App. 4th 613 (2009).

⁵⁸ I Andoulsi, and P Wilson, *Understanding Liability in eHealth: Towards Greater Clarity at European Union Leve*” in George, Carlisle; Whitehouse, Diane and Duquenoy, Penny *eHealth: Legal, Ethical and Governance Challenges*, Springer 2013.

⁵⁹ *Ibid.*, p.165.

⁶⁰ For the purpose of this paper, liability is used in the context of damage caused by a *tortfeasor* who inflicts harm on another person and thus occasions damage in the process. See *Wood v. Currey*, 57 Cal. 209; *McElfresh v. Kirkendall*, 36 Iowa, 225; *Benge v. Bowling*, 100 Ky. 575, 51 S. W. 151; *Joslin v. New Jersey Car-Spring Co.*, 36 N. J. Law, 145.

⁶¹ RT Nimmer, *The Law of Computer Technology* (1985), T 5.16, at 5-59.

⁶² *Ibid.*

⁶³ ME Gerstner, Comment, *Liability Issues with Artificial Intelligence Software*, 33 *Santa Clara L. Rev.* 239 (1993) 246.

Weighing the arguments above, one submits that the determination of whether an artificial intelligence systems can be held legally liable depends on at least three factors; the limitations of AI systems, and whether these are known and communicated to the purchaser; whether an AI system is a product or a service; and whether the offence requires a *mens rea* or is a strict liability offence.⁶⁴ In the end, it must be understood that for an artificial intelligence to be held liable, the question arises of whether it should be held liable as an innocent agent, an accomplice, or a perpetrator. So, artificial intelligence systems can be liable under negligence, vicarious liability and strict liability. This could be categorised as fault based and non-fault-based liability.⁶⁵

Andoulsi and Wilson further make a distinction between fault-based liability under which “the party harmed as a result of the failure to comply with a duty of obligation will need to show that a duty existed, that a harm resulted from the failed or poor execution of that duty, and that the party with the duty acted negligently in failing to execute the duty properly”⁶⁶ and non-fault liability in which “the party suffering harm may obtain a compensation without having to show any negligence on the part of the manufacturer or service provider; they will only have to show a causal link between the product or service and the harm”.⁶⁷ The latter form of liability is also referred to as strict liability. Strict liability is intended to stimulate an increase of the investments in product’s safety and to facilitate claims by the consumers against producers.⁶⁸

Jao Paulo de Almeida,⁶⁹ looking at the issue of liability generally, aptly opines that the drafting of an efficient liability regime requires a “right balance between consumer protection and industrial profitability”.⁷⁰ This means that the development of technology must be made in such a way that it does not disturb the

⁶⁴JKC Kingston, *Artificial Intelligence and Legal Liability*, (University of Brighton, 2016).

⁶⁵ Non-fault based liability is a common principle of EU consumer protection laws, being based on Directive 93/13/EEC on unfair contract terms; Directive 1999/44/EC on sales and guarantees and Directive 97/7/EEC on distance selling.

⁶⁶ *Ibid*, note 62, 165.

⁶⁷ *Ibid*.

⁶⁸E Palmerini et al, “RoboLaw: Towards a European Framework for Robotics Regulation.” (n.d.), available on <https://www.sciencedirect.com/science/article/pii/S0921889016305437>, (Last accessed 1 March 2020).

⁶⁹*Ibid*.

⁷⁰*Ibid*.

enjoyment of the user. Karnow,⁷¹ however, points out two limitations fixing liability on intelligent agents themselves; noting that data and programmes that make up a network are scattered, it is not possible to identify all the various points of fault. Moreover, it would be near-impossible for courts to identify what the proximate cause for the failure is, when the various causes (due to the interconnected nature of the network) cannot be sorted out amongst themselves. This leads to a breakdown of the classic cause and effect analysis of liability.

In determining liability for copyright infringement by AI, the best solution would be to examine who had influence over the action of the algorithm resulting in the legal violation. It might be the case that the person who created the algorithm designed it in such a way that it cannot operate without infringing copyright. In that case, even if the user does not intend to infringe copyright, they are more or less forced to do so, as use of the algorithm is inseparably bound up with violation of other persons' copyright.⁷² In that situation, it should be found that the person liable for the copyright infringement is the person who wrote the algorithm.

Other than civil liability, computers are also criminally liable. For one to be criminally culpable there must be a harm caused by his action which makes him guilty.⁷³ The general principle of criminal responsibility is akin to the common law doctrine of *actus non facit reum nisi men sit rea*, simply interpreted as the concept of subjective blame-worthiness of no liability without fault.

Gabriel Hallevy proposes three models of criminal liability – The Perpetration-via-Another Liability Model; The Natural-Probable-Consequence Liability Model and The Direct Liability Model.⁷⁴ He advocates that while they may be applied separately, a combination of them would come in better use.⁷⁵ This model proposed by Hallevy envisages the fact that criminal culpability by artificial intelligence should have a corresponding equivalent in the artificial intelligence world.⁷⁶ Asaro

⁷¹ CE Karnow, "Liability for distributed Artificial Intelligences." (1996) *Berkeley Technology Law Journal*, .191-192.

⁷² K Szczudlik, "Liability for Copyright Infringement by AI." (March 14, 2018), available at: <https://newtech.law/en/author/katarzyna-szczudlik/>, (last accessed May 2, 2019).

⁷³ Andrew Ashworth *Principles of Criminal Law* (5th ed, Oxford University Press, New York, 2006) 31.

⁷⁴ G Hallevy, *The Criminal Liability of Artificial Intelligence Entities-From Science Fiction to Legal Social Control*. Akron Intell. Prop. J. (2010) p.174.

⁷⁵ *Ibid*, p.174.

⁷⁶ *Ibid*, p.195.

differs from Halevy's opinion and argues that criminal liability cannot be applied to robots directly as criminal actions can only be performed by moral agents and deciding punishment for robots is no easy task. However, he proposes an alternative – criminal liability for robots can be applied akin to such liability for corporations, who are also non-human but separate legal persons.⁷⁷ He leaves open the question of how punishment can be meted out to robots, though, since their motivations and reasons for existence are quite different from those of corporations (to make money).

4. Analysis of the Legal Frameworks of Copyright of AI in selected Jurisdictions

The ownership of copyright works of artificial intelligence has been scrutinised in different jurisdictions. Examining these extant laws in these jurisdictions elucidates substantive rules that are applied to determine the adequacy of the legal frameworks.

4.1 The United Kingdom

There were lots of legislative initiatives and proposals by the European Union (EU) and UK⁷⁸ countries in 2017 with the aim of considering and addressing the impact of artificial intelligence on the society.⁷⁹ These initiatives covered questions arising from liability, legal personality and other ethical and legal issues, including in the context of data processing. In March 2017, the UK Information Commissioner's Office updated its big data guidance to address the development of artificial intelligence and machine learning, and to provide GDPR, which will apply from 25 May 2018.⁸⁰

In the UK, traditional copyright law grants protection to the original creations of authors (which include artists, composers and other creators). An author of a work

⁷⁷PM Asaro, "Robots and Responsibility from a Legal Perspective." Proceedings of the IEEE, (2007), Pp.20- 24.

⁷⁸ In April of 2016 the EU's new General Data Protection Regulation was passed. Although it represents the most far-reaching data protection legislation to date—since it will have direct effect (which means that it will be immediately applicable and enforceable) in all the EU Member States beginning on 25 May 2018— it must first be placed within the wider context of the European legal landscape on data protection. See I. Taylor, "The General Data Protection Regulation ([EU] 2016/679): WHITE PAPER." (February 20, 2017), Available on https://interparestrust.org/assets/public/dissemination/WhitePaper_on_GDPR.pdf, (last accessed April 12, 2019).

⁷⁹ M Butterworth, "The ICO and Artificial Intelligence: The Role of Fairness in the GDPR Framework." *Computer Law & Security Review*, (2018), pp 257-268.

⁸⁰*Ibid.*

is defined as the person who creates it; with additional clarification for particular types of work e.g. the producer of a sound recording is deemed to be its author.⁸¹ For a literary, artistic, dramatic or musical work, which includes software, to qualify for copyright protection the work must be "original". Case law provides that for a work to be original it must be its "author's own intellectual creation".

The legal ownership of computer-generated works is perhaps deceptively straightforward in the UK. In the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken.⁸² The Act further defines a computer-generated work as one that "is generated by computer in circumstances such that there is no human author of the work."⁸³ This is the most concise definition given to computer generated works. This definition puts to rest any form of argument about creative works produced by artificial intelligent or any of its agents.⁸⁴

This shows that the UK is among a few countries that offer a robust protection to computer generated works;⁸⁵ the countries mentioned on the footnote also patterned theirs after the UK system of protection granted to computer generated works. This is one of the most salient aspects where UK and Irish copyright law diverges from the European norms.⁸⁶

⁸¹ C Chance, "AI and IP: Copyright in AI-generated Works (UK Law) – Can AI exist in a Computer-generated Work, (November 27, 2019), available at: <https://talkingtech.cliffordchance.com/en/ip/copyright/ai-and-ip--copyright-in-ai-generated-works--uk-law-.html>, (last accessed August 4, 2019).

⁸² Copyright, Designs and Patents Act (CDPA), s. 9 (3)

⁸³ *Ibid*, s. 178

⁸⁴ In this jurisdiction, in the absence of direct human intervention, the author of a computer-generated work shall be taken to be 'the person by whom the arrangements necessary for the creation of the work are undertaken

⁸⁵ Besides the UK, such protection exists only in Ireland, New Zealand, India, and Hong Kong. See: J. McCutcheon, "Vanishing Author in Computer-Generated Works: A Critical Analysis of Recent Australian Case Law" *Melbourne University Law Review*, 36 (2012) 915, at 956. It is worth pointing out that while McCutcheon also includes South Africa in the list, the definition in the s 1(1)(i) is for a computer programme, not computer-generated work.

⁸⁶ For example, the Copyright and Related Rights Act 2000 (Ireland), s 21(f) says that an author in computer-generated works is "the person by whom the arrangements necessary for the creation of the work are undertaken". Almost the same wording can be found in Copyright Act 1994 (New Zealand) s 5(2)(a); Copyright Act 1978 (South Africa) s 1(1)(h); and Copyright Act 1957 (India) s 2(d)(vi).

4.2 The United States

Under the US law, inventorship is the first point of analysis for determining ownership of IP. Identifying what contributed to the development of an AI-related patent for the purposes of determining whether someone was an "inventor" will probably happen more frequently. Although drawing the inventorship line may be complicated, the legal analysis substantially follows the legal touch points currently applied to other complex technologies.⁸⁷ As AI develops, however, the patent bar may be confronted with another type of inventorship analysis that may be outside of the scope of current US law. Currently, inventors are individuals. But what if an AI-enabled machine invents something? What if an AI algorithm—without any human intervention—develops a new drug, a method of recognising diseases in medical images, or a new blade shape for a turbine? Section 100(f) of the Patent Act, 35 U.S.C.A. § 100(f) defines "inventor."⁸⁸ Accordingly, perhaps Congress, and not the courts, may have to make changes to existing patent law to address potentially patentable subject matter developed autonomously by AI.

Under section 101 of the Patent Act,⁸⁹ the subject matter of a patent claim must be directed to a "process, machine, manufacture or composition of matter." However, the US Supreme Court held in *Diamond v Diehr*,⁹⁰ that claims directed to nothing more than an abstract idea, such as a mathematical algorithm, or to natural phenomena or a law of nature are not eligible for patent protection. The US Patent Act limits patentable subject matter to "new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof".⁹¹ *Alice Corporation Pty. Ltd. v CLS Bank International*⁹² recently made it more challenging for applicants to obtain patents on software or "computer-

⁸⁷ FA, De Costa and AG, Carrano, "Intellectual Property Protection for Artificial Intelligence." *Westlaw Journal Intellectual Property*, (2017), p.1.

⁸⁸ The legislative history of that section indicates that Congress intended statutory subject matter to "include anything under the sun that is made by man," according to the U.S. Supreme Court in the case of *Diamond v. Chakrabarty*, 447 U.S. 303 (1980).

⁸⁹ 35 U.S.C.A. § 101

⁹⁰ 450 U.S. 175 (1981),

⁹¹ 35 U.S.C. § 101.

⁹² *Supra*, note 20, para. 2355 sets out a two-prong test for determining patent-eligibility, in which the first step is determining whether the claims are directed to a patent-ineligible concept, such as an abstract idea and, if so, the second step is considering "the elements of each claim both individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application", in search for an "inventive concept.").

implemented inventions”.⁹³ The seminal Alice decision has been interpreted and applied by the Federal Circuit and various lower federal district courts to generally exclude patent claims directed to subject matter that could be performed through an “ordinary mental process”, “in the human mind” or by “a human using a pen and paper”, with the limited exception for claims that specifically provide ways to achieve technological improvements over the tasks previously performed by people.⁹⁴

This aspect of Alice’s legal framework creates tension with AI patents because the goal of AI is often to replicate human activity.⁹⁵ For example, in *Purepredictive Inc. v H20.AI, Inc.*, the United States District Court for the Northern District of California held that the asserted claims of US Patent No. 8,880,446 covering AI-driven predictive analytics were “directed to a mental process and the abstract concept of using mathematical algorithms to perform predictive analytics”.⁹⁶ After further finding that the patent’s claims “do not make a specific improvement on an existing computer-related technology”, the court invalidated the claims for being directed to patent-ineligible subject matter.

4.3 Nigeria

In Nigeria not every work is eligible for copyright. Simply put, an ostensible work of copyright must come under the list enumerated under the Copyright Act.⁹⁷ These include literary works; musical works; artistic works; cinematograph films; sound recordings; and broadcasts.⁹⁸ With respect to literal, musical or artistic work,

⁹³ M Bultman, “3 Years After Alice, Patent Applicants Facing Better Odds”, Law360 (23 October 2017), available at: <https://www.law360.com/articles/976914/3-years-after-alice-patent-applicants-facing-better-odds>, (Last accessed July 31, 2019); Morningside IP, “The Alice Decision and its Fallout in the U.S.” (11 May 2017), <http://www.morningsideip.com/the-alicedecision-and-its-fallout-in-the-u-s/>, Last accessed July 31, 2019).

⁹⁴ *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1314-15 (Fed. Cir. 2016); see also *Blue Spike, LLC v. Google Inc.*, No. 14-CV01650-YGR, 2015 U.S. Dist. LEXIS 119382, at *13-16 (N.D. Cal. 8 September 2015) (“To the extent artificial intelligence inventions—or the present ‘invention’—involve an inventive concept, they could be patentable even if they have, at their core, an abstract concept.”), *aff’d in Spike v. Google Inc.*, No. 2016-1054, 2016 U.S. App. LEXIS 20371 (Fed. Cir. 2016).

⁹⁵ World Economic Forum, “Artificial Intelligence Collides with Patent Law.” Center for the Fourth Industrial Revolution, (April 2018), www3.weforum.org/docs/WEF_48540_WP_End_of_Innovation_Protecting_Patent_Law.pdf, (last accessed August 3, 2019), p.10.

⁹⁶ No. 17-cv-03049-WHO, 2017 U.S. Dist. LEXIS 139056, at *13 (N.D. Cal. 29 August 2017).

⁹⁷ Copyright Act, Cap c28 Laws of the Federation of Nigeria, 2004, s. 1.

⁹⁸ *Ibid.*

sufficient efforts must have been expended by the creator to give them an original character and they must be fixed in any definite medium of expression now known or later to be developed from which it can be perceived, reproduced or otherwise communicated either directly or with the aid of any machine or device. A copyright protects the author.⁹⁹ Under the Copyrights Act, the first ownership of copyright is enjoyed by the author of the work, unless a contract of employment or apprenticeship with a publisher stipulates that it belongs to the employer.¹⁰⁰

An in-depth analysis exposes an interaction between Artificial Intelligence in Nigeria and the Copyright Act. AI related applications will usually run on software. However, it is important to note that there are no provisions for the protection of software under the Copyright Act in Nigeria. Copyright protection arguably only extends to the original documented expression of the software. This original expression does not extend to the functionality of the software. It is only limited to the blueprint either in an audio, written or any other form permissible by the Copyright Act as being protectable thereunder.

5. Conclusion

Although copyright laws have been moving away from originality standards that reward skill, labour and effort, perhaps we can establish an exception to that trend when it comes to the fruits of sophisticated artificial intelligence. The alternative seems contrary to the justifications for protecting creative works in the first place. Having critically analysed various laws above on the protection of AI, neither national nor international law recognises AI as a subject of law, which means that AI cannot be held personally liable for the damage it causes. In view of the foregoing, a question naturally arises: who is responsible for the damage caused by the actions of AI? In the absence of direct legal regulation of AI, a resort can be made to the United Nations Convention on the Use of Electronic Communications in International Contracts, which states that a person (whether a natural person or a legal entity) on whose behalf a computer was programmed should ultimately be responsible for any message generated by the machine.¹⁰¹ Such an interpretation complies with a general rule that the principal of a tool is responsible for the results obtained by the use of that tool since the tool has no independent volition of its

⁹⁹ However, the work must have been published (reduced to material form or definite medium, not just an idea) –

Walter v. Lane [1900]AC, 539, HL

¹⁰⁰*Ibid.*, s. 10.

¹⁰¹Article 12.

own.¹⁰² It has become imperative to amend existing *IP legal regimes in order to provide for computer-generated works and AI operation, both in Nigeria and internationally. The law needs to clearly identify the rights and liabilities, if any, attributable to the AI for its inventions. Alternatively, a computer or AI related IP legislation may be enacted to deal with the intricacies associated with authorship of AI and computer-generated works, among others.*

¹⁰²P. Čerka^a, Jurgita Grigienė^a, and Gintarė Sirbikytė, “Liability for damages caused by artificial intelligence.” *Computer Law & Security Review*, Volume 31, Issue 3, (2015) 376-389.