AI Created Works and Authorship under Irish Copyright Law: I'm afraid I can't copyright that

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I. Introduction

All technology starts from humble beginnings; from computers the size of a room to smartphones, floppy disks to streaming services and digital storage in the 'Cloud'. Technology that would have been unimaginable fifty years ago is treated as a normal part of everyday life. The problem that arises is when the advancements made begin to outpace our ability to control and regulate the technology itself.

Regulating technological advancements provides challenges to policy makers. The benefits of new technologies can be endless, that is undisputed. Yet, all consequences need to be considered, with careful thought and analysis being a must.[1] One technological advancement that is beginning to require attention is artificial intelligence ('**AI**'). AI has been a common science fiction trope for many years but it is becoming increasingly integrated into everyday life as well as more and more advanced.[2] As AI continues to progress, the processes it engages in require less and less human input. As a result, the question arises: what happens when an AI 'creates' a finished product and more importantly who owns that creation; and who can enforce the rights, if any, that follow from this hypothetical creation? While these questions at one point in history were merely academic, this is now a real intellectual property law consideration.

This article will analyse these questions after addressing a number of key preliminary points. Part II will examine what an AI is for the purposes of this discussion, and attempt to ground the language that surrounds this developing area of technology. Part III will address some underlying rationales for having copyright protections at all. Part IV will give a summary of copyright law in Ireland and address some elements unique to the questions concerning AI and copyright. Part V will see an analysis of the potential ownership of AI created products. Part VI will seek to offer some recommendations and address the conclusions of this discussion.

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[1] In an open letter from the Future of Life Institute entitled 'Research Priorities for Robust and Beneficial Artificial Intelligence', it is noted '[b]ecause of the great potential of AI, it is important to research how to reap its benefits while avoiding potential pitfalls'. This letter has been signed by over 8,000 signatories including the late Stephen Hawking.

[2] For an interesting discussion with Ian Goodfellow, the creator of the GAN, or 'generative adversarial network' where AIs work against each other to further learn and improve in their performance of tasks see <https://www.technologyreview.com/s/610253/the-ganfather-the-man-whos-given-machines-the-gift-of-imagination/> accessed 16 April 2020.

In this article, the use of 'product' when addressing the creations of AI is used to prevent confusion between the hypothetical pieces created by an AI and the legal term 'works', which when used in a copyright related context has a clear legislative definition. 'Create' is used in the general sense of 'to bring into existence'.

II. What is AI

The average layperson's understanding of AI is typically rooted in science fiction. AI has been a common trope in media, with one of the earliest explorations of AI in fiction seen as far back as the 1860s.[3] Nevertheless, AI is very much a reality. A simple definition of AI is 'a system capable of performing tasks that would normally require human intelligence such as recognition, decision-making, creation, learning, evolving, and communicating'.[4] The notion that a computer could learn beyond its programming is not a new or novel concept; Alan Turing, a pioneer in computer science and part of the team that deciphered the Enigma code used during the Second World War, stated that AI learning would 'be like a pupil who had learnt much from his master. When this happens, I feel that one is obliged to regard the machine as showing intelligence'.[5]

Russell and Norvig reference eight different definitions in their discussions on AI.[6] They are grouped under four main headings: Thinking Humanly, Thinking Rationally, Acting Humanly and Acting Rationally. Thinking Humanly in this context means anthropomorphising AI, and seeing it as a machine with a mind. Thinking Rationally means viewing AI through the lens of being able to perceive, reason and act accordingly. Acting Humanly is concerned with AI doing tasks that humans normally do. Acting Rationally sees AI as being intelligent things; while intelligent, it is still a thing or an object.

With regard to how an AI operates, there are inputs and outputs. As summarised by Poole, there are a number of relevant inputs and they will vary depending on the task the AI has to carry out.[7] One example used is an infobot, which has the task of extracting information from a variety of sources which includes the internet and encyclopaedias. The input is a request to act a certain way or use certain things in its task. Some inputs that would be needed include:

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[3] Samuel Butler, 'Darwin among the Machines' *The Press* (Christchurch, 13 June 1863) examined the notion of 'machines' evolving beyond what we can perceive.

[4] Shlomit Yanisky-Ravid, 'Generating Rembrandt: Artificial Intelligence, Copyright and Accountability in the 3A Era – The Human-like Authors are Already Here – A New Model' (2017) Michigan State Law Review 659, 673.

[5] Lecture to London Mathematical Society on 20 February 1947. <http://www.turingarchive.org/browse.php/B/1> accessed 16 April 2020.

[6] Stuart J Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach* (3rd edn, Prentice Hall 2009) 2.

[7] David Poole, Alan Mackworth, Randy Goebel, *Computational Intelligence: A Logical Approach* (OUP 1998) 15.

- Prior knowledge about the meaning of words, the types of information sources, and how to access information.
- Past experience about where information can be obtained, the relative speed of various servers, and information about the preferences of the user.
- Goals in terms of what information it needs to find out and tradeoffs about how much expense should be involved to get the information and the tradeoff between the volume and quality of information.
- Observations about what information is at the current sites, what links are available, and the load on various connections.[8]

The output is information that the requestor can understand. The AI does the compiling of all the information and presents it in a form that can be comprehended. It is given the information to do a task, and it then does said task.

Indeed, modern AI can function intelligently and be programmed to 'learn'. A core concept of modern AI is not only carrying out a task, but improving on what it previously did.[9] It also means less and less human intervention will be needed. As AI develops, it will learn not only with increased speed but also learn in more novel and effective ways. It is not impossible, it is submitted, to conceive of an era where there is no human input needed in an AI's processing of tasks.

Clearly a detailed and thorough analysis of the definition of what is and what is not an AI is beyond the scope of this article.[10] However for the purposes of this article, an AI is deemed to be an AI if it has the ability to create products with minimal to no human intervention which could in theory be copyrightable (if said products were created by a human). For instance, if a computer program can paint, create music or write a novel or poem, then this is an AI for the purposes of this article. Copyright can exist in paintings, musical and literary works so the authorship of those AI created products requires consideration. It should be noted that this is very much understating the potential of AI and in the future, the possibilities could be endless. Pearlman notes that advances in AI will only continue once the appropriate investments are available.[11] While currently discussions surrounding products created by AI are in their infancy and AIs often require human intervention at some stage of their inception, it is no longer outlandish to say AI is 'creating'.[12]

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8 ibid 17.

9 One such example is AlphaZero, an AI that learned how to play the popular game 'Go', chess and shogi and beat world champions in their respective games. For more information, see David Silver and others, 'A general reinforcement learning algorithm that masters chess, shogi and Go through self-play' (2018) 362 Science 1140 (issue 6419).

10 For a detailed analysis in a legal context, see Shlomit Yanisky-Ravid (n 4) 673.

11 Russ Pearlman, 'Recognizing Artificial Intelligence (AI) as Authors and Inventors under US Intellectual Property Law' (2018) 24 (2) Richmond Journal of Law & Technology 1.

12 It may indeed be unfair of this author to even suggest that the funding of AI is in its infancy. 'Private Equity Investment in Artificial Intelligence', OECD Going Digital Policy Note states that between 2011–mid 2018, USD$50 billion was invested in AI and that there has been a surge in venture capital firms entering into investments with AI based projects.

III. Rationales for Copyright

Copyright protection has existed in some form or another since the 16th century, with seminal legislation coming into being in the form of the Statute of Anne in 1710.[13] The justification for copyright existing at all can vary depending on whether the discussion is based on civil law or common law principles, with civil law countries tending to focus on the author's rights and personality, whereas common law countries tend to focus on the work carried out and the requirement for this to be rewarded.[14] This is grounded in France's focus on Hegelian principles concerning personality and the UK's focus on Lockean principles of labour.[15]

However, to summarise the underlying rationales for copyright a simple point needs to be expressed. All systems of copyright protection have a core concept, namely that 'large parts of the ... population would answer in the affirmative if asked whether they generally supported the idea that it is not fair to "steal" somebody's result of his/her intellectual effort, labour, without paying for it one way or another'.[16]

One basis for protecting works is via a utilitarian approach to intellectual property that the act that benefits the most people should be the desired course of action. Actions that promote the most public good should be encouraged and therefore rewarded. Indeed, it can be said that 'utilitarian theorists argue that limited monopolies spur innovation, and in order to foster innovation the system must recognise exclusive rights in intellectual creations – rights which are limited in duration and scope and are balanced against rightholders' economic aspirations and power'.[17]

The fundamental notion is that people's creations will benefit society and the public in general. However, the only way to ensure that they create is to incentivise them to do so. The whole premise of a utilitarian model is that people create because there is a reward for them doing so. This operates on the basis that it is important to strike the correct balance between the public's interest and private rightholders' interests.[18]

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[13] The Statute of Anne, known officially as the Copyright Act 1710, implemented the regulation of copyright being carried out by government and the courts. Previously in England, private parties were given this task.

[14] For a history of the emergence of differing States' approaches to copyright law, see Sam Ricketson and Jane C Ginsberg, *International Copyright and Neighbouring Rights: The Berne Convention and Beyond*, vol 1 (OUP 2006) 6–19.

[15] For further discussion on this, see Maureen O'Sullivan, 'Irish artistic copyright law: a menagerie of holy cows and turtle doves?' (2015) Intellectual Property Quarterly 31.

[16] Henning Wiese, 'The justification of the copyright system in the digital age' (2002) 24(8) European Intellectual Property Review 387, 393.

[17] Lior Zemer, 'On the value of copyright theory' (2006) Intellectual Property Quarterly 55, 57.

[18] For further discussion on striking the appropriate balance, see William Landes and Rchard Posner, 'An Economic Analysis of Copyright Law' (1989) 18 Journal of Legal Studies 325.

This justification has its critics. It is difficult to quantify the actual benefits of this system, meaning striking a balance is difficult. Moore has noted that '[e]mpirical questions about the costs and benefits of copyright ... are notoriously difficult to determine. Economists who have considered the question indicate that ... the jury is out, so to speak'.[19] Moore gives the example of Microsoft holding 60–80% of the world market share for computer operating systems; they have patented their products and hold copyright protection over their code. This, he notes, has a detrimental effect on social progress as anyone attempting to create a new product must obtain a licence from Microsoft.[20] This is contrary to utilitarianism as less people are benefitting from this system as a whole since this monopoly has somewhat halted innovation.

Another such justification often applied to copyright, and intellectual property as a whole, is a labour-based model. While John Locke's writings analysed property in general, the analogies used can be applied to discussions on intellectual property. In his Second Treatise on Government, Locke wrote that man is entitled to the produce of his labour from objects in the commons, that 'every man has "property" in his own "person" ... The "labour" of his body and the "work" of his hands, we may say are properly his'.[21] Gordon has summarised this as stating that 'the laborer who achieves property in what she takes from or makes from the common, has a claim right in it that all others have a prima facie duty to respect'.[22]

Indeed this approach has been adopted by the English courts, with Mansfield LJ commenting that 'men of ability, who have employed their time for the service of the community, may not be deprived of their just merits and the reward of their ingenuity and labour'.[23] In essence, those who put effort into creating, deserve to own the creation and benefit from it.

A criticism of this theory and its application to copyright is that this 'commons', which in this case is information, is a fallacy. This has been expressed by Nguyen, who has said that, '[i]t is hard to believe that there exists some form of common intellectual "soil" given to humankind in the state of nature. Unlike the universe of physical goods and other natural resources, ideas cannot credibly pre-exist or exist independently of the human mind'.[24]

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[19] Adam D Moore, 'Intellectual Property, Innovation, and Social Progress: The Case Against Incentive Based Arguments' (2011) 26 Hamline Law Review 602, 629.

[20] ibid 616.

[21] Locke, Second Treatise on Government, Chapter V [25]. For a useful analysis of Lockean theory in the context of copyright, see Mala Chatterjee, 'Lockean Copyright vs. Lockean Property' (2020) 11 Journal of Legal Analysis (forthcoming at time of writing).

[22] Wendy J Gordon, 'A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property' (1993) 102(7) The Yale Law Journal 1533, 1553.

[23] *Sayre v Moore* (1785) 1 East 361n, 362.

[24] Vu Nguyen, 'Incomplete Rationales for Intellectual Property And A Social-Relations Perspective' (BA thesis, Wesleyan University 2010).

This critique can be summarised in the following way. Ideas cannot be treated in the same fashion as tangible resources. The application of a labour-based justification is inapplicable to copyright because of this. Ideas require humans to think of them; there are no ideas without humans. As a result of this, to say that an idea is from the exertion and effort of one person is simply incorrect; ideas are built upon by the research of others and previous ideas on a particular topic.

Locke also said that hoarding of resources is not something to encourage. Locke's theory presupposes that one will only take what is sufficient, and will share in resources 'which would otherwise spoil or go to waste'.[25] It is difficult to see how Locke's theory on limiting waste could be used to justify a monopoly of resources (in this case copyrightable works and the knowledge that comes with them) where there is a clear duty to share and take only what is needed. While the labour-based theory is the grounding of copyright to many, it is not without its logical faults.

Another justification for copyright is the personhood approach. The premise of this approach is that by creating an external object or concept, it becomes part of that person's personality. Hughes asserts that '[s]uch a justification posits that property provides a unique or especially suitable mechanism for self-actualization, for personal expression, and for dignity and recognition as an individual person'.[26] Radin asserts that the more closely connected to the person and their personality, the stronger the entitlement to control that object is.[27] The basis for protection is that since the author carried out work on the object it has become part of that person. They have become associated with it and the person is entitled to hold some control over it. It can be said that some of their personality has gone into the work, and the two are now interconnected.

This has been criticised for being a romanticised version of what intellectual property is. Not only is this a fanciful idea of how copyright operates in the modern world, but Jaszi points out that this persistence of focusing on the author and their creativity 'makes it difficult for any new legal synthesis, which would focus on the reality of collective creativity, to emerge.'[28] Collectivism is a more realistic way to view creations in the modern day; each idea builds on what came before it.

The basis for justifying copyright does have implications, this author submits, for the likelihood of AI created products being granted copyright protection. A utilitarian basis would look to the least disruptive response and the solution that is most likely to lead to new works being created, as the utilitarian model is concerned with benefiting the most people. A labour-based justification could produce a number of results; no one exerts any effort when an AI creates a product

[25] Wendy J Gordon (n 22) 1543.

[26] Justin Hughes, 'The Philosophy of Intellectual Property' (1988) 77 Georgetown Law Journal 287, 330.

[27] Margaret Jane Radin, 'Property and Personhood' (1982) 34 Stanford Law Review 957.

[28] Peter Jaszi, 'On the Author Effect: Contemporary Copyright and Collective Creativity' (1992) 10 Cardozo Arts & Entertainment Law Journal 293, 295.

(ignoring the amount of work it took for that AI to get to this stage) so there is no justification in granting copyright protection. However, looking to the bigger picture, there was effort exerted to integrate the AI into a system where it could create products so copyright should vest in someone. The personhood reasoning may prove the highest threshold to meet; AI created products do not have any "personality" as a machine created them. Machines do not have a personality or indeed personhood in the same way human creators do. The personhood of the creator would therefore not be respected or protected by granting copyright.

IV. Copyright Law in Ireland

In Ireland, copyright is regulated by the Copyright and Related Rights Act 2000 (as amended) ('**2000 Act**'). The 2000 Act seeks to regulate, inter alia, what is included under the term 'copyright', how copyright is protected and the term for which it is protected. In Ireland for copyright to vest in a creation, three criteria must be met. First, it must be original. Secondly it must be tangible and fixed. Lastly it must fall under an accepted category of works. Once these criteria are met, the copyright in the work becomes vested in the author of that work.

The second criterion requires little analysis in comparison with the first. The work will nearly always be tangible as once a work is created, it is in a tangible form. While certain types of products exist that can be created digitally and only remain in existence for a short period of time (eg temporary folders in a computer used to house material until a permanent file is created) that is not the focus of this article. This article is focused on more traditional forms of 'works', which if created by a human would garner little controversy with regard to their authorship. The third criterion is, to a degree, straightforward as section 2 of the 2000 Act defines 'work' for the purpose of vesting copyright; the definition is broad and encompasses nearly all potential forms of works.[29]

Originality is a requirement for copyright to vest under section 17(2) (a) of the 2000 Act. It is submitted by this author that the originality requirement for copyright will not prove to be a major issue for AI created products. Originality is a low threshold to overcome, with very little in the way of creativity needed in order for a product to be deemed an original work. This is evident in a number of unorthodox forms of works being deemed original.[30] Originality is more concerned with a work not being a blatant copy, with Peterson J observing that 'the expression

[29] The definition as contained in section 2 (as amended) is as follows: 'work' means a literary, dramatic, musical or artistic work, sound recording, film, broadcast, cable programme, typographical arrangement of a published edition or an original database and includes a computer program except in Part II, Chapter 7 where 'work' means 'literary, dramatic, musical or artistic work or film'.

[30] One such example saw television listings being given copyright protection (*RTÉ v Magill TV Guide* [1990] ILRM 534).

must be in an original or novel form but that the work must not be copied from another work – that it should originate from the author'.[31] While the exact threshold of what is deemed 'original' is difficult to define, it has been stated that there is no requirement of novelty in idea or concept.[32] It has been observed that 'the standard of originality that is set by way of judicial decision is slight. As long as the author produced the work independently by use of the author's own skill, knowledge or labour or by the exercise of judgment or taste, the resulting product will be regarded as original'.[33]

Therefore, it appears at first glance that there are few hurdles in place for AI created products being given copyright protection. However, the first difficulty in seeking to extend copyright protection to products created by an AI is seen in the legislation itself, namely section 2(1) of the 2000 Act. The term 'author', from which copyright protection flows, is defined in section 2(1) as having the meaning given to it in section 21. At section 21, a list of possible categories which attract copyright protection is stated.[34] The issue is that in all of these categories, the author is the person who creates the work. No matter what form of interpretation is used, an AI is not a person. There is simply no end result that would allow a court to interpret AI as a person. The term 'person' in Irish law has a legislative meaning under the Interpretation Act 2005 ('**2005 Act**'). Section 18(c) of the 2005 Act defines a person as 'importing a body corporate (whether a corporation aggregate or a corporation sole) and an unincorporated body of persons, as well as an individual'.

Currently in Irish law there is no scope for an AI to be deemed a natural person or a legal person in the same way a corporation is a legal person. An AI cannot be deemed a natural person as it is an entirely technological concept, nor is it tangible. AI is not treated in the same way as a company, which has separate legal personality due to this being granted to it by its legal incorporation. For an AI to be treated the same as a company, without significant changes to company law and our understanding of legal persons, is simply not a possibility.

Even from a European approach, there is no protection to works wholly created by an AI. In the seminal case of *Infopaq*, the European Court of Justice held that

[31] *University of London Press Ltd v University Tutorial Press Ltd* [1916] 2 Ch 601, 608–609.

[32] Robert Clark, Shane Smyth and Niamh Hall, *Intellectual Property Law in Ireland* (4th edn, Bloomsbury Professional 2016) [11.05].

[33] Clark, *Irish Copyright and Design Law* (Bloomsbury Professional 2019) 1 Definition [13].

[34] Section 21 defines 'author' as the person who creates a work and includes: (a) in the case of a sound recording, the producer; (b) in the case of a film, the producer and the principal director; (c) in the case of a broadcast, the person making the broadcast or in the case of a broadcast which relays another broadcast by reception and immediate retransmission, without alteration, the person making that other broadcast; (d) in the case of a cable programme, the person providing the cable programme service in which the programme is included; (e) in the case of a typographical arrangement of a published edition, the publisher; (f) in the case of a work which is computer-generated, the person by whom the arrangements necessary for the creation of the work are undertaken; (g) in the case of an original database, the individual or group of individuals who made the database; and (h) in the case of a photograph, the photographer.

in determining originality in a work, the national court must decide if it was the 'author's own intellectual creation'.[35] A human is very much the focus of this test and it has been noted any AI created work would have real difficulties in meeting the *Infopaq* decision, with Handig highlighting that '"author's own intellectual creation" clarifies that a human author is necessary for copyright work'.[36]

There is however some scope for works created in a non-traditional way. The 2000 Act had a degree of foresight which, in this author's opinion, is to be commended.[37] The 2000 Act provides a definition for computer-generated works, ie 'work [which] is generated by computer in circumstances where the author of the work is not an individual'.[38] At section 21(f) of the 2000 Act, the protection for the works is to be attributed to the person 'by whom the arrangements necessary for the creation of the work are undertaken'. The result of this is that there is a mechanism in place for works created by 'computers'. While this foresight is to be commended it is not without fault.

It is the submission of this author that while the current regulation of computer-generated works in Ireland is admirable and was ground-breaking at the turn of the millennium, it simply will not be enough to match the potential growth of AI. e-David offers a practical application of how this is not a long term, sustainable solution. e-David was created by the University of Konstanz in 2009. It 'combines a camera, computer vision software, and a standard welding robot arm to skillfully recreate (in a variety of styles ...) any image you feed its software'.[39] It even knows when to wash its brushes. Indeed, an AI has even created a new Rembrandt painting, after analysing paintings by the Dutch artist.[40] While this would have been beyond belief when the 2000 Act was the subject of debate in the Oireachtas, AI created products with little human intervention are a reality.

The issue, it is submitted, is that currently, the law views computers (and by extension AI and other learning software) as a tool. The following quote from Whitford J highlights the legal approach to this issue: '[t]he computer was no more than the tool ... It is as unrealistic as it would be to suggest that, if you write your work with a pen, it is the pen which is the author of the work rather than the

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35 Case C-5/08 *Infopaq International A/S v Danske Dagblades Forening* [2009] ECR I-06569, [48]. For an analysis of this case and how it affects UK copyright law, see Andres Guadamuz, 'Do androids dream of electric copyright? Comparative analysis of originality in artificial intelligence generated works' (2017) Intellectual Property Quarterly 169.

36 Christian Handig, 'The Copyright Term "Work" – European Harmonisation at an Unknown Level' (2009) 40 IIC 665, 672.

37 US Copyright Office, Compendium of US Copyright Office Practices § 101 (3rd edn, 2017) at Chapter 613.1 states that the author is the 'person (or persons) who actually created the material that the applicant intends to register' and there is little scope for computer-generated works in the sense of the 2000 Act.

38 Section 2, 2000 Act.

39 Jason Falconer, 'eDavid the robot painter excels in numerous styles' 17 July 2013. <https://newatlas.com/edavid-robot-artist-painter/28310/> accessed 16 April 2020.

40 <https://www.nextrembrandt.com/> accessed 16 April 2020.

person who drives the pen'.[41] While this quote is over thirty years old, the approach to regulating software that can create has not changed. A complex AI cannot be compared with a pen. A pen does not have any input into the finished product, ie the work itself. It cannot learn from previous attempts to improve its future end products, nor can it refer to works created by others to develop its own creative process. While the 2000 Act, with its inclusion of 'computer-generated' works indicates some greater role for an AI than merely facilitating creation, the 2000 Act does not account for an AI that can create products with little to no human input, where the person by whom the arrangements necessary for the creation of the work are undertaken is far removed from the process. The 2000 Act still views AI as requiring direct human involvement which is no longer the case.

With the current state of AI, a more apt analogy than Whitford J's pen is said pen being a complex, carefully constructed computer programme, which has been tested numerous times and then programmed to carry out a task, for instance to paint a picture. This AI is then asked to paint a picture. The AI receives its instructions and then it refers to its previously created products. It also draws inspiration from all similar paintings ever created, in the same way a human would develop their style by learning from others and adapting to form its own process. The AI then gives the person who requested the painting an original creation. This outdated analogy of a pen not being able to create copyrightable work is being applied to the regulation of AI created products today, which this author submits is unacceptable.

The UK and Ireland are not the only jurisdictions where this approach has been seen. *Comptroller of the Treasury v Family Entertainment Centers* considered animatronic puppets that danced and sang at a restaurant and whether this was a taxable performance.[42] While this was primarily a tax case, it provides a useful synopsis of thought in this area. The Maryland court who ruled on this case stated:

> [A] pre-programmed robot can perform a menial task but, because a pre-programmed robot has no "skill" and therefore leaves no room for spontaneous human flaw in an exhibition, it cannot "perform" a piece of music ... Just as a wind-up toy does not perform for the purposes of [the statute,] neither does a pre-programmed mechanical robot.[43]

The approach by Whitford J and the Maryland court highlight the problems seen. While neither court had the ability to predict what computers and AI would eventually become, this general rationale of AI being mere tools still determines the consequences of AI creating potentially copyrightable works. As advancements in AI continue, the person by whom the arrangements necessary for the creation of

[41] *Express Newspapers v Liverpool Daily Post & Echo plc* [1985] 1 WLR 1089, 1093.

[42] 519 A.2d 1337, 1338 (Md. 1987).

[43] ibid 1339. See also n37 on the Compendium of US Copyright Office Practices which clearly provides for persons in order for copyright to vest.

the works are undertaken becomes more and more removed from the copyrightable work. AI will no longer be mere tools, unable to 'perform' or 'create'. To say that e-David and the Rembrandt-creating AI are mere tools or should be treated the same as a wind-up toy is simply ignoring the current and potential capabilities of AI.[44] Indeed, it is no longer science fiction to imagine a time when there could be little to no human involvement at all in creating certain works.

It is noted that the Copyright and Other Intellectual Property Law Provisions Act 2019 ('**2019 Act**') has amended certain provisions of copyright law in Ireland; the District Court and Circuit Court can now hear certain claims, thus reducing costs. Parody also has an express exemption in Irish copyright law. However there is no mention of AI created products in the 2019 Act. This was, it is submitted, a prime opportunity to provide some clarity in this developing area of law as the 2019 Act could have provided for the entity that holds copyright in AI created products. Regardless of the approach taken in the 2019 Act (or indeed lack of approach therein), it is not a case of whether AI created products will happen, but a case of when this will happen and it is submitted that preparation for this should begin now. There is no point in being reactive when there is the potential to be proactive.

V. Potential Ownership of Works

When discussing the interactions between copyright and AI created products, one needs to consider the number of potential entities that copyright could vest in. As previously addressed, the current copyright regime provides for copyright to vest in a human (or legal) person and protection flows from that vesting. In order for copyright to operate, there needs to be a party in which to vest. For instance, the entire area of moral rights, rights that concern the use of the work contrary to an author's wishes, requires a person present to whom the rights in the work belong. Enforcement of said rights follows on from that vesting. Holding copyright in a work is of little use if it cannot be enforced. Currently in Ireland the protections in place for AI created products are unsatisfactory; there is arguably no protection at all or that protection will benefit parties far removed from the creative process who, it could be argued, do not deserve copyright protection being vested in them. For reform in this area to have a lasting and positive effect, there must be a party that can hold the copyright in the work. The following sections will address potential owners and the benefits and consequences of each party holding the copyright.

[44] This is analogous to the concept of 'systems' being uncopyrightable as seen in American case law. As expressed by Bruce Boyden in 'Games and Other Uncopyrightable Systems' (2011) 18(2) George Mason Law Review 439, 465, copyright cannot vest in systems as what was seen was 'the owners of a copyright in a form, description, or set of instructions ... attempting to extend their copyright to material for which the user of the work provided the essential content, not its author ... They were, without that input, empty shells, waiting to be filled'. In the same way that the user of a system inputs the essential content, an AI inputs the essential content in the examples mentioned above.

The End User

The end user is the closest in proximity to the finished product in question. As noted by Dorotheou, the threshold for originality may be met by the end user.[45] Indeed, it would be logical at first glance for the user of the AI to hold the copyright; they have control over the AI when it is creating (they may have even paid for it) and therefore should be entitled to reap the benefits.

However, it is the AI in these cases that actually carries out the work. The issue that this author sees with the end user having copyright vested in it is that, as AI becomes more advanced, the end user will have little to no involvement in the work. While the end user is incentivised to create more by holding the copyright, the effort it had to put in to be rewarded with the copyright is minimal which is at odds with nearly every justification for copyright to exist.[46] In the future that effort may be non-existent.[47] The sheer volume of works that could be created could be beyond comprehension and that would not be of benefit to the community as a whole as there would be a vast monopoly created.

There are however provisions under the current law of copyright that may provide some form of regulation for AI created products. Section 23(1) (a) of the 2000 Act provides that:

> The author of a work shall be the first owner of the copyright unless—(a) the work is made by an employee in the course of employment, in which case the employer is the first owner of any copyright in the work, subject to any agreement to the contrary.

In many ways an AI could be deemed to be an 'employee' of the end user; it is requested to do an action, it carries out a task and provides a finished product which the end user would have the ability to use, release to the general public and collect revenue from. While a detailed analysis of the employment relation and classifying what is an employee-employer relationship is beyond the scope

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[45] Emily Dorotheou, 'Reap the benefits and avoid the legal uncertainty: who owns the creations of artificial intelligence' (2015) Computer and Telecommunications Law Review 85, 90.

[46] It could be argued that the utilitarian approach to copyright protection might deem this acceptable as more works are being created which adds to the collective knowledge of the public. As a result, the trade-off is worth the lack of effort seen by the end user. However Lockean or Hegelian principles cannot justify this approach.

[47] For an example of the scale of AI created works, see the discussion on Qentis, a Russian company that uses AI to create, in Jesus Manuel Niebla Zatarain, 'The role of automated technology in the creation of copyright works: the challenges of artificial intelligence' (2017) 31 (1) International Review of Law, Computers & Technology 91. One such point to note is the following quote from Qentis; 'Qentis has generated and deployed 97.42% of all possible texts of ten to four hundred words in length'.

of this article,[48] an AI is certainly under the control of the end user which, while not decisive, is one factor to consider.[49] While it is more apt to describe an AI as a resource or asset of the end user (albeit an intelligent resource or asset), it is submitted that section 23(1) (a) of the 2000 Act provides some solutions to the issues that AI created products bring. It provides some certainty as to who would garner copyright protection and solves the logical fallacy of the person gaining the benefit of copyright protection being removed from the process.

This system would have a number of benefits. As stated by Yanisky-Ravid,[50] one advantage of this system is that this model (as noted) does not ignore the problem of recognition of AI created products and actually seeks to address it. It recognises that AI created products exist and should be given recognition as works. It incentivises the effective use of AI to create products that the general public will benefit from. This approach would also mean a party is assigned the copyright and there is accountability over the work in question. Someone will have to answer for the AI's actions. Yanisky-Ravid also states that it allows copyright to be amended as opposed to abandoned entirely which provides stability to authors of traditional works. This author submits that this approach is the best solution to the issues raised by authorship in AI created products that protects the idea of copyright as a legal avenue for protection. The end user is the closest in time to the creation of the product and decides that it is to be created. They are the instigator of the work, which is as close to an author as AI created products will get within the current model of copyright. They can be incentivised and it makes logical sense for the copyright in a work to be vested in the end user.

This approach is not without its faults. This is entirely a legal fiction as an AI is not an employee of the end user; there is no contractual clause providing for ownership of intellectual property rights as seen in many standard employment contracts. The end user is still removed from the process in a way, as the AI will do more and more of the 'creating' as AI becomes more advanced, but also as the individual AI learns how to improve on its tasks. Despite all this, in order to ensure consistency in the application of copyright, there needs to be a party in which to vest copyright. As will be expressed later in this article, there should be certain amendments made to copyright when the subject is AI created products. However, for the reasons above, while this author submits that the end user is the most suitable person to hold copyright in AI created products, a number of other potential holders need to be examined.

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[48] For a detailed analysis of the employee-employer relationship in Ireland, see Maeve Regan and Ailbhe Murphy, *Employment Law* (2nd edn, Bloomsbury Professional 2017) [2.11]–[2.35].

[49] *Henry Denny & Sons (Ireland) Ltd v Minister for Social Welfare* [1998] 1 IR 34.

[50] Shlomit Yanisky-Ravid (n 4) 716–718.

The Programmer

One possible person to vest copyright in is the programmer of the AI, ie its creator. This is certainly attractive on its face as there will, in the vast majority of cases, be a person or persons that copyright can vest in thus providing certainty. The programmer also plays a key role in the work in an indirect way as this is the human with the most creative input into the work. The programmer will code how the AI processes the information it receives, how it will 'learn' and improve and therefore determine how it will create. Despite this, as noted by Dorotheou, the programmer having copyright vested in them is unlikely.[51]

The entire purpose of AI capable of generating copyrightable products is that human input is minimal. As stated above, human involvement in AI created products is only going to lessen as AI becomes more advanced. There is likely to be a point in time where AI can create works without any human input whatsoever. It makes little sense to reward the programmer for work they have little to no actual involvement in creating. Indeed, as highlighted by Dorotheou 'the programmer sets the rules for the robot to operate, leaving the actual form of the final work unpredictable'.[52] AI will create products that are not predicted or pre-determined, without human involvement.

To vest copyright in a person who had no comprehension of the work that will actually be created is contrary to the entire system of copyright which rewards the intellectual skill and labour used to create a work. Whether copyright is concerned with rewarding authors for their effort and remunerating them for their work, or recognising that part of the author's personality is given to their work and this must be protected, is irrelevant. Neither Lockean principles of labour or Hegelian principles on personality can be applied to protecting a programmer of an AI that creates its own works. Bridy has noted that merely removing the 'middleman' altogether and simply awarding the programmer the copyright is a possibility, however as she has noted:

> to do so would miss something very important about the nature of these works and the process by which they are produced. Such statements are simply not true, even if they get us around the problem that copyright law is not currently structured to accommodate the particular authorship matrix of people-who-write-programs-that-make-art.[53]

It is also important to highlight the fact that programmers will often hold the copyright in the code of the AI itself, which it is submitted is sufficient remuneration. Vesting copyright in them would in many ways reward them twice

[51] Emily Dorotheou (n 45).

[52] ibid 89.

[53] Annemarie Bridy, 'Coding Creativity: Copyright and the Artificially Intelligent Author' (2012) Stanford Technology Law Review 5, 22.

and there is simply no justification for this to occur. It cannot be said that vesting copyright in the programmer would incentivise them to create, or reward them for their work. The programmer does not decide that a work is created, nor do they contribute to the work being created. The programmer merely provides the ability to create works; they are quite far removed from the creative process itself. Therefore, it is submitted that the copyright in AI created products should not be vested in the programmer.

The AI

Should an AI be granted the copyright in the products it has created? This would certainly be a drastic shift from precedent in this area; as addressed above a person is required for copyright to vest. Despite this, it would address the issues with other potential authors (as discussed above). The AI created the product, it determined what form and substance that product would take and therefore the AI exerted the effort used to create the product. One should reap the benefits of one's labour. To paraphrase Locke, an entity is entitled 'to the sweat of its brow'. Should the form that entity takes matter? McCorduck summarised the hostility to machines being generally creative when she said 'it's part of the history of the field of artificial intelligence that every time somebody figured out how to make a computer do something—play good checkers, solve simple but relatively informal problems—there was a chorus of critics to say, but that's not thinking'.[54]

While some argue AI do create and this should be acknowledged as such, Cohen has pointed out that AI should be granted rights due to the fact they can have personality and a number of similar characteristics with humans.[55] The European Parliament in 2017 also suggested that the Commission take into account the implications for 'creating a specific legal status for robots in the long run, so that at least the most sophisticated autonomous robots could be established as having the status of electronic persons'.[56] It is clear to see that minds are turning to examine whether AI being given personhood is a solution to a number of problems including copyright.

Electronic personhood is comparable in many ways to legal personhood. Legal personhood is the premise that an entity, through some legal recognition, can hold

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[54] Pamela McCorduck, *Machines who Think: A Personal Inquiry into the History and Prospects of Artificial Intelligence* (2nd edn, A K Peters, Ltd 2004), 204.

[55] Glenn Cohen, 'Should We Grant AI Moral and Legal Personhood?' <https://perma.cc/ELL3-CQRK> accessed 16 April 2020.

[56] European Parliament, 'Motion for a European Parliament Resolution with recommendations to the Commission on Civil Law Rules on Robotics' (2015/2103(INL)). It should be noted that in a European Commission Press Release 25 April 2018 entitled 'Artificial intelligence: Commission outlines a European approach to boost investment and set ethical guidelines', 'electronic personality' is not mentioned.

a certain swathe of rights in the same way a natural person can. The most common example of this is the incorporation of a company, where that company now has a separate legal personality from the individuals that make up the company. It can sue and be sued, it can hold property and it can enter into contracts.[57] The whole premise of legal personhood is to put in place a system capable of 'mutually respecting [a] persons' rights and of enforcing legal control against any breaches thereof'.[58]

It is the submission of this author that this approach, while unorthodox, is not currently suitable. Advanced AI is somewhat in its infancy and to treat AI the same as a corporation, which has natural persons guiding it, would be leaving too much regulating to the unknown. To analyse one aspect of this potential scenario, who would be entitled to any monies arising under licences granted by an AI? Would the AI be allowed to spend money? While AI is currently able to create, the above is beyond its current capabilities and as a result a human would need to intervene. Would a licence fee even be necessary, considering AI does not create for personal enrichment? All that is seen in relation to the above hypothetical is a legal fiction. Legal fictions, when continually used without a sound basis for their implementation can lead to problems not previously envisaged. As stated by Craig and Kerr, the entire point of a legal fiction is to preserve categories in law where a particular scenario does not fit.[59] The alternative is to rewrite a settled area of law to allow an outlier to be justifiable. Instead, a fictitious position is adopted in order to 'appease' the law. They note there is a danger that repeated use of a legal fiction 'will chip away at the legal distinction between humans and AIs and ultimately undermine the ontological category of "author"'.[60] While this is noted in the context of the 'work-for-hire' doctrine, this illustrates the dangers of applying a fiction. In attempting to regulate a scenario, there is the danger of leaving too much to the unknown.

What is seen with the above is not rewarding an AI for creating in order to better society, (being a core justification for copyright when using Lockean, personality or utilitarian justifications), but creating a legal fiction where an AI has rights but a human is required to have involvement in order for these rights to be exercised. This, it is submitted, is simply illogical. To grant AI personhood would leave too much regulating to a legal fiction. This author is not alone in this reluctance, with an open letter requesting the European Commission to refuse electronic personhood as a concept gathering over 280 signatures at the time of writing.[61]

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[57] For further discussion on the parameters of legal personhood, see Thomas Courtney *The Law of Companies* (4th edn, Bloomsbury Professional 2016), [4.023]–[4.084].

[58] SM Solaiman, 'Legal personality of robots, corporations, idols and chimpanzees: a quest for legitimacy' (2017) 25(2) Artificial Intelligence and Law 155, 159.

[59] Carys Craig and Ian Kerr, 'The Death of the AI Author' DRAFT (25–03–19) <https://robots.law.miami.edu/2019/wp-content/uploads/2019/03/Kerr_Death-of-AI-Author.pdf> accessed 16 April 2020.

[60] ibid 22.

[61] Open Letter to The European Commission: Artificial Intelligence and Robotics <http://www.robotics-openletter.eu/> accessed 16 April 2020.

While this author is not ruling out this potential approach in the future, it is simply too soon to grant AI electronic personhood along with the plethora of rights that go with it. It would be a logical leap of faith, with too much being left to the unknown. One such instance of this is whether AI would even want copyright. Humans have a tendency to anthropomorphise items in everyday life, and AI is no different.[62] Before AI is granted personhood or even copyright protection, consideration should be given as to whether it is appropriate to grant copyright to an entity that does not 'feel' like a human does. More needs to be known about how advanced AI will operate before this step is taken; once personhood is granted it cannot be taken away as it defeats the whole purpose of personhood. Lawmakers would require in-depth consultation periods with computer scientists and other interested parties in considering this area.

The Public Domain

The notion of works generated by a computer being released into the public domain is not a new or novel concept.[63] The basis for this model is that since computers do not have legal personhood in the same way a corporation does, they cannot 'own' property. Rights cannot vest in them; therefore, they cannot hold intellectual property rights over products they create. One potential rationale of intellectual property as discussed above is that it grants a monopoly in order to reward those who created and incentivise them to create more. The question remains: does an AI need an incentive to create? Do they need a monopoly over their products to incentivise them to create more?

It is the submission of this author that having AI created products automatically become public domain completely sidesteps the issue at hand. This scenario is not an AI creating on its own accord. Computer-generated products in this sense will relate to another party using AI to create works. If works are simply in the public domain, meaning anyone can reproduce them, what is the incentive to create? There would be a strong possibility that this approach would mean less work is made available to the public for their consumption or for research in general as creators feel there is little reward in creating. After all, one of the grounding principles of copyright law (and intellectual property law as a whole) is to reward creators for their efforts; copyright is 'intended to motivate the creative activity of authors and inventors by the provision of a special reward, and allow the public access to the products of their genius after the limited period of exclusive control has expired'.[64] If works created by an AI are public domain, it does not reward anyone for their creation. There is a danger of a chilling effect on the creation of works.

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[62] Brian R Duffy, 'Anthropomorphism and the social robot' (2003) 42 Robotics and Autonomous Systems 177.

[63] Ralph Clifford, 'Intellectual Property in the Era of the Creative Computer Program: Will the True Creator Please Stand Up?' (1997) 71 Tulane Law Review 1675, 1702–1703.

[64] *Sony Corp of America v Universal City Studios Inc* 464 US 417, 429 (1984).

There needs to be a balance in this of course; for the reasons stated above an AI does not need to be rewarded or incentivised in the same way as a person does. In fact, it is worth considering whether AI created products should be rewarded with copyright protection at all; the sheer volume of potential work that could be created needs to be considered. Human authors, or those who create in a traditional sense, cannot hope to match AI that can create works. AI does not require breaks, holidays or even an incentive to create. This pace cannot be matched by the typical human author. The solution may lie in having AI created products become public domain from the moment of creation to ensure parity between traditional and non-traditional creators. There is value to be seen in the public domain which is for society's use and benefits more people.[65]

Despite the concerns above, if the product created by an AI is in the public domain, there is potential for less work to be created. The end user of the AI may see no reason to create if anyone is entitled to use what the end user views as 'their' work. Not only could less be created, with less knowledge being shared as a result, this will also have a chilling effect on innovation as AI will be deemed less useful and the incentives to invest in AI that create will no longer exist. There is also the danger of works in the public domain being altered in negative ways which actually decreases their quality. Martin gives the example of "It's a Wonderful Life" and the poor-quality copies that were in circulation until the film's rightholders enforced their copyright over the film.[66] Since the film was previously treated as public domain, the quality of the reproductions of the film varied greatly. This would result in the opposite of intellectual property's overall goals; the betterment of society by the creating and sharing of ideas.

Something Else?

It is clear after analysing the above that each approach has its merits, while each also has its flaws and reasons to look elsewhere for a solution. There is also the option

[65] Kris Erickson, Fabian Homberg, Martin Kretschmer and Dinusha Mendis, *Copyright and the Value of the Public Domain: An empirical assessment* (Project Report, UK Intellectual Property Office 2015/44) addressed the potential value of the public domain to the online encyclopaedia site Wikipedia. They state at page 65 'that those pages containing images do perform better than their counterparts not benefitting from the presence of an image. We find a net increase of between 17% and 22% in visitorship to biographical pages containing images. Based on our analysis of digital licence costs on equivalent commercial platforms, we conservatively estimate the equivalent market value of public domain images on English language Wikipedia to be in excess of USD $208 million (GBP £138 million) per year, taking into account costs saved to Wikipedia page builders. Using an alternative method of valuation based on increased visitorship, we calculate that increased traffic associated with the inclusion of public domain images would represent USD $33,896,638 (GBP £22,613,633) in advertising revenue for an equivalent commercial website'.

[66] Scott M Martin, 'The Mythology of the Public Domain: Exploring the Myths Behind Attacks on the Duration of Copyright Protection' (2002) Loyola of Los Angeles Law Review 253, 272–275.

that rights in the form of copyright protection for works are not needed and other incentives which currently exist can be utilised. As stated by Ginsburg, the humans involved in AI created products can be incentivised to 'create' with 'copyright or patent protection of the software programs, patent protection of the specialised machinery to produce works of fine and applied art, and copyright or (in the EU) *sui generis* protection of the database the software consults'.[67]

While it is possible that AI created products would be created even if copyright protection did not vest in them, this author submits that this attitude is incorrect to hold. There has been little commentary or judicial dictum in this area and this would be a departure on our current understanding of copyright. This author submits it would be worthwhile for the issues around AI created products to be considered now.

The Rationales

This author submits that if the rationales behind copyright are examined, it will give an indication of which entity may be given copyright protection. As a starting point, it is difficult to imagine this work being freely given to the public domain. All the justifications for copyright speak of the benefits of rewarding creativity, and this author would argue that it is antithesis to intellectual property as a whole to allow newly created products be freely reproduced.

Taking a utilitarian approach, it is arguable that the entity which would provide the most benefit would be granted copyright protection. This, it is submitted, is the end user, ie the last person in the chain of production. This makes the most logical sense as there will always be a controlling entity somewhere in the chain that can have copyright vested in it and they have ultimate control over the amount of products created.

If a labour-based approach is taken, there are two potential avenues that could be explored. Either it is deemed no copyright should vest at all as no one exerts any effort when AI created products come into being and there is simply no justification to grant copyright. The alternative is that the AI is part of a system which creates and this took effort to bring to fruition. Once again, copyright would vest in whoever put in the effort to bring the AI into the creative process; who this is will likely vary on a case by case basis.

If one is having regard to a personhood approach, an analysis of whose personality has been placed in the work would need to be undertaken. This proves challenging with a hypothetical but there is an argument to be made that the programmer most likely put their personality into the work as they gave the instructions to create the

[67] Jane C Ginsburg, 'People not machines: authorship and what it means in the Berne Convention' (2018) 49(2) IIC 131, 134.

work. While they are removed from the process in many ways, no one else, it is submitted, has contributed more of themselves to the product created.

It is clear from the above that the question of who gets copyright vested in them will be a challenging concept as, not only will this depend on the style of cases that begin to appear, but the justification behind copyright adopted by decision makers will also be of relevance.

VI. Recommendations and Conclusions

This article has sought to highlight that AI created products are a reality. Ireland, and indeed the wider legal world, currently has no definitive answer to the question of ownership of copyright in AI created products. It is clear AI can create paintings and song lyrics (among many other types of works for copyright purposes under the 2000 Act). The problem is that these works are likely to have no author if created by an AI. In the alternative, the author designated under current copyright law will not be the person best suited to be classified as such; it would be contrary to the justifications of intellectual property as a whole to vest copyright in a person that had little to no involvement in the creation of the work. While a number of parties could be awarded the copyright over products created by AI, it is submitted that the end-user is the person best placed to have copyright vested in them. What is important however is recognition of the proposition that AI is not like a pen or a typewriter. It is a complex code and regulation of AI needs to reflect this. AI can create products with little to no human intervention and this will require careful thought.

As a result, this author would recommend that changes are needed in the modern system of copyright to ensure products created by an AI do not suffer from a lack of protection. This author would suggest clear legislative intervention to provide that the end-user of an AI is the creator of products created by that AI, similar to the application of section 23(1) (a) of the 2000 Act. This aligns with the justifications for copyright and, it is submitted, is the most logical solution for the time being. This author does recognise that this is a legal fiction as addressed above; an AI does not need an incentive to work. It does not grasp Lockean principles of labour and property, nor does it give a piece of its personhood when it creates. However for the reasons above the end user is the best placed person to hold the copyright in AI created products.

It is submitted that the copyright vested in the author of AI created products should operate differently than copyright in other works. This is because AI created products are different to other forms of work; they can be created quickly and with little human input as addressed above. This author proposes a 'copyright-light' scheme, where products created by an AI are given a short-term copyright. This begins from the date of creation of the product in question and expires a number

of years after the date of creation, for instance ten years. The exact length of time for the protections will require further thoughts, but this example is merely used to show that the full term for copyright protection is not being sought, but some form of protection should be granted to AI created products. It is submitted that this provides legal certainty for the vesting of copyright, protection for those creating and incentivises AI created products but this also recognises that AI created products are different and the typical copyright term is incompatible with AI created products.

The 2019 Act does not address the issues above. While this is perhaps unsurprising, legislative intervention should be the preferred option to determining who holds the copyright in AI created products. This area of law will undoubtedly require intervention in the near future and it is submitted by this author that acting now, when a problem is recognised, is better than acting when this problem comes before a court. There is a danger of going too far into an area we do not understand; AI is advanced now, but it is impossible to predict where it will be in 10, 20 or 50 years. Despite all this, this author submits that to bury our heads in the sand and ignore this is a problem is far too short-sighted. Action or, at the very least, a frank conversation about how to treat AI created products is needed.