Examining Copyright Protection of AI-Generated Art

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Through time, the world has witnessed the evolution of art as painstakingly created by human authors, to art created by human authors with aid of computer technology, and more recently, to art created by artificial intelligence. Although art as an output remains unchanged, its very essence, as embodied in the process of creation, is altered. Advancements by generative artificial intelligence systems in the field of art ('AI-Generated Art') has disrupted the way in which art is created thus raising a myriad of questions on its creation, ownership, and protection. While AI-Generated Art has certain similarities with contemporary art thus meriting copyright protection, AI-Generated Art and its underlying system do not exactly fit within the traditional copyright framework. An absence of a protection framework will cause AI-Generated Art to immediately fall into the public domain, and its use may place it in a state of perpetual infringement. Failing to extend adequate protection to AI-Generated Art is a disservice to creativity and innovation and a blatant disregard of what is beautiful, appealing, or provocative as manifested in AI-Generated Art.

I. Introduction

Connected to a piece of art is an author, a soul of human creativity who seeks to convey his or her deepest thoughts and strongest emotions to the world. The author treats art as a physical manifestation or expression of his or her personal experiences. A 'pure creative activity of the human spirit'¹, art embodies rich meaning rooted in 'a feeling [the author] has experienced'².

Art traditionally serves as a medium by which the audience peers into the ideas shaped by the author's distinct experiences. Through the 'emotive force of art-work [sic]', the audience forms a deep connection with the author based on 'perceptual and emotional immediacy of direct experience'³ with the artwork.

The rise of technological developments is constantly disrupting how the author and the audience interact through a piece of art. Through time, the world has witnessed the evolution of art as painstakingly created by human authors, to art created by human authors with aid of computer technology, and more recently, to art created by artificial intelligence. Although art as an output remains unchanged, its very essence, as embodied in the process of creation, is altered. Technological developments, particularly creation by artificial intelligence inadvertently removes the fundamental aspect of art's evocative meaning thereby decreasing opportunities to develop connections with and draw emotions from art as an expression of human creativity. Advancements by generative artificial intelligence systems in the field of art ('Art-generating AI Systems') has disrupted the way in which art is created thus raising a myriad of questions on its creation, ownership, and protection.

This article shall examine art generated by artificial intelligence ('AI-Generated Art') and its implications on intellectual property laws. It seeks to focus on issues arising from legal protection, and governance of AI-Generated Art under the traditional intellectual property framework. Part II shall briefly discuss the conceptual framework of AI-Generated

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1 Alfredo Casella and Otis Kincaid, 'What is Art?' [1922] The Musical Quarterly 1

2 Leo Tolstoy, 'Art and Sincerity' <<http://www.denisdutton.com/tolstoy.htm>> accessed 15 November 2018

3 Michelle Marder Kamhi, 'Thought and Feeling in Art – An Integrated View' (Aristos, July 2009) <<https://www.aristos.org/aris-07/thoughtinart.htm>> accessed 15 November 2018

Art. Part III shall address whether AI-Generated Art merits protection and if so, whether the current applicable intellectual property regime is sufficient to protect AI-Generated Art, particularly those created by direct guidance of humans or by autonomous creation. Part IV shall inquire whether other legal means apart from copyright protection are more suitable to protect AI-Generated Art.

II. Defining Artificially-Generated Art

Art encompasses a myriad of artistic fields ranging from literature, performing arts, and visual arts.⁴ It is characterised by a human author's expression of creativity often rooted in his or her ideas and emotions. The process of creating art is deemed highly creative where 'movements, lines, colors, sounds, or forms expressed in words'⁵ 'signifie[s] "variation"'⁶ based on a human author's distinct 'mental conceptions'⁷.

Artificial intelligence has fundamentally changed the way art is created. Traditionally, creation of art is contingent on the efforts of a human author who exemplifies his or her creativity and skill through the craft. In the 1950s, it evolved to computer-aided creation whereby human creativity is supplemented with the use digital tools.⁸ Most recently, it has displaced the role of individuals by means of Art-generating AI systems, particularly machine learning.

Machine learning is defined as 'a form of Artificial Intelligence called an "expert system" [which] combines a knowledge based of facts, and rules derived from those facts, with an inference engine that reaches conclusions'.⁹ Systems that use machine learning commonly train themselves on existing works and generate output works based on previous learnings.¹⁰ In the case of AI-Generated Art, the expert system analyses countless works of art based on artistic style and produces a similar output. It is capable of learning how to 'generate prose, paintings, motions pictures, musical compositions, and so on' from information compiled.¹¹ Existing systems which have successfully generated art include 'The Next Rembrandt', an artwork generated by a computer that analysed the works of 17th century Dutch artist Rembrandt van Rijn¹²; 'Konpyuta ga shosetsu wo kaku hi (The Day a Computer Writes a Novel)', a short novel written by a Japanese program which advanced

in the Hoshi Shinichi national literary award¹³; and 'Magenta', Google's Deep Mind – created software which has the ability to generate music by listening to past recordings¹⁴.

Scholars have identified four key elements to explain the basic structure of Art-generating AI systems: Inputs, Learning Algorithms, Trained Algorithms, and Outputs. Inputs are pre-existing works of art which are loaded into the expert system.¹⁵ Inputs essentially act as basic building blocks which serve as training data for the expert system to learn from. Learning Algorithms utilise these building blocks and analyses any relevant characteristics through a machine learning algorithm.¹⁶ It collates information generated from its analysis in a data structure, which corresponds to Trained Algorithm.¹⁷ Trained Algorithms link data generated from Inputs and Learning Algorithms, to Outputs. It is information in the form of a data structure consisting of probabilities and operations.¹⁸ By means of seed materials, a set of instructions either provided though a template or selected by the system itself, it transforms probabilities and operations into a specific Output.¹⁹ Outputs represent a tangible 'form

4 Merriam-Webster, 'Arts' <<https://www.merriam-webster.com/dictionary/the%20arts>> accessed 15 November 2018

5 Tolstoy (n 2)

6 Casella (n 1)

7 Kamhi (n 3)

8 Cade Metz, 'How A.I. Is Creating Building Blocks to Reshape Music and Art' *New York Times* (New York, 14 August 2017)

9 Benjamin L. W. Sobel, 'Artificial Intelligence's Fair Use Crisis' (2017) 41 *Colum. J.L. & Arts* 45, 58

10 *ibid*

11 *ibid*

12 ING, 'The Next Rembrandt' <<https://www.nextrembrandt.com/>> accessed 15 November 2018

13 Netexplo Observatory 'Konpyuta Ga Shosetsu Wo Kaku Hi' (*NetExplo Observatory*) <<https://www.netexplo.org/en/intelligence/innovation/konpyuta-ga-shosetsu-wo-kaku-hi>> accessed 15 November 2018

14 Magenta, 'Magenta' <<https://magenta.tensorflow.org/>> accessed 15 November 2018

15 Jessica Fjled and Mason Kortz, 'A Legal Anatomy of AI-generated Art: Part I' (*Jolt Digest*, 21 November 2017) <<http://jolt.law.harvard.edu/digest/a-legal-anatomy-of-ai-generated-art-part-i>> accessed 15 November 2018

16 *ibid*

17 *ibid*

18 *ibid*

19 *ibid*

recognisable as “art”²⁰, which is more commonly known as AI-Generated Art.

It is evident that the creative process involved in AI-Generated Art vastly differs from that of contemporary art. The former is a by-product of technological expertise, information fed into the expert system, and algorithms, while the latter is a result of the artistry rooted in the thoughts and experiences of a human author. This raises the question of whether AI-Generated Art is still considered art. The proponent submits that art created by Art-generating AI systems remains art due to the creative output produced. Although the creative process involved in AI-Generated Art vastly differs from that of contemporary art, the end result remains the same in the sense that both processes produce tangible creative works.

Naysayers argue that ‘machines will never be as creative in the sense humans are creative’²¹ and art-generating AI systems are nothing but ‘tools...[or] computational techniques [which] create a broader palette for artists’.²² It is often deemed that creativity differentiates humans from machines.²³ Aspects of ‘emotion, intuition, and imagination’²⁴ which characterise contemporary art is as ‘an expression of human skill and creativity’ and as a ‘catalyst for human reflection and contemplation’²⁵ are often deemed lacking in AI-Generated Art. Nonetheless, the core concept of art as a means of creative expression ‘of what is beautiful, appealing, or provocative’²⁶ remains poignantly evident in AI-Generated Art. Art-generating AI Systems’ capacity to create ‘artistic and

innovative works’²⁷ has paved the way for it to be treated as a ‘new source of creativity’²⁸.

III. Protection of AI-Generated Art

Art-generating systems product artistic works through technologies such as machine learning. These systems learn from a Trained Algorithm and are capable of generating original artistic work which merit protection.

Traditionally, art and artistic works enjoy intellectual property protection, particularly copyright. Intellectual property rights extend protection ‘to promote and encourage cultural and technological development’.²⁹ Copyright protection, in particular, exists ‘to encourage a dynamic creative culture, while returning value to creators so that they can lead a dignified economic existence, and to provide widespread, affordable access to content for the public’.³⁰ It aims to protect and reward creators and other right holders with some sort of monopoly over a period of time for their efforts geared towards innovation. It likewise serves as a legal tool against unscrupulous free-riding thereby inhibiting development of works and ‘discourage[ing] future investments in new literary, artistic and creative works’.³¹

Copyright protects the expression of ideas manifested in literary, dramatic, musical, or artistic works. It requires eligible subject matter, originality, and fixation in a tangible medium.³² As long as the three

20 *ibid*

21 Martin Gayford, ‘Robot Art Raises Questions about Human Creativity’ (2016) MIT Technology Review., <<https://www.technologyreview.com/s/600762/robot-art-raises-questions-about-human-creativity/>> accessed 15 November 2018

22 Metz (n 8)

23 New Art Academy, ‘Art and AI: What Place for Human Artists in a Future Dominated by Artificial Intelligence?’ (*New Art Academy*, 30 January 2018) <<https://www.newartacademy.com/blog/2018/1/30/artificial-intelligence>> accessed 15 November 2018

24 *ibid*

25 Dr. Marcus Volz, ‘When Computers Make Art’ (2018) University of Melbourne <<https://pursuit.unimelb.edu.au/articles/when-computers-make-art>> accessed 15 November 2018

26 *ibid*

27 Kalin Hristov, ‘Artificial Intelligence and the Copyright Dilemma’ (2017) 57 *IDEA* 431, 433

28 *ibid* 431

29 Candidate 183, ‘EU Copyright Protection of Works Created by Artificial Intelligence Systems’ (MSt thesis, University of Bergen 2017)

30 Yahong Li, Professor, University of Hong Kong, (Hong Kong, 13 September 2017)

31 Candidate 183 (n 29) 10

32 Berne Convention for the Protection of Literary and Artistic Works [1886] 1 B.D.IEL. 715 [Berne Convention], art 2. (1) The expression ‘literary and artistic works’ shall include every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression, such as books, pamphlets and other writings; lectures, addresses, sermons and other works of the same nature; dramatic or dramatic or musical works; choreographic works and entertainments in dumb show; musical compositions with or without words; cinematographic works to which are assimilated works expressed by a process analogous to cinematography; works of drawing, painting, architecture, sculpture, engraving and lithography; photographic works to which are assimilated works expressed by a process analogous to photography; works of applied art; illustrations, maps, plans, sketches and three-dimensional works relative to geography, topography, architecture or science.

fundamental requirements are evident, then copyright protection extends to the expressed work.

At first glance, AI-Generated Art is likewise eligible for copyright protection. The expression of ideas is manifested in the AI-generative system's 'ability to derive valuable information'³³ from Inputs to generate a Learning Algorithm. Through this process, the AI-generative system is able to 'glean value from ["Inputs"] expressive aspects'³⁴ and consequently express ideas in the form of Outputs.

AI-Generated Art satisfies the above requirements of copyright protection. First, AI-generative systems produce art which falls under the domain of artistic work, an eligible subject matter of copyright.³⁵ Outputs generated by the systems fall under 'every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression'³⁶, as defined in the Berne Convention. However, it likewise raises the question of whether AI-Generated Art should be considered as artistic work or as a computer-generated work. This shall be addressed in Part IV.

Second, AI-generative systems are capable of exemplifying independent creation and a modicum of creativity³⁷ thus satisfying originality. The modicum of creativity required under originality is often misunderstood as inventiveness. It is important to note that the degree of creativity required in copyrighted works is only 'a spark or minimal degree of creativity'.³⁸ The low standard simply entails that 'the work contains a minimal amount of material that goes beyond being an idea, a fact, or other basic building block'.³⁹ AI-Generated Art complies with the required standard by using Learning Algorithm and Trained Algorithm to recognise and learn from any patterns made available through Inputs.⁴⁰ By 'mimicking human learning'⁴¹, the system 'reorganise[s] existing data in different patterns'⁴² akin to the 'reordering of things that [humans] already know' during the creative process. Contrary to popular belief, works arising from the so-called creative process are often not a result of pure imagination or 'a spark in the mind that cannot be quantified or described in terms of data'⁴³ but rather some sort of recombination of what already exists. In fact, scholars are of the view that 'the very act of authorship in *any* medium is more akin to translation and recombination than it is to creating Aphrodite from the foam of the sea'⁴⁴ since creative actors 'all engage in the process of adapting, transforming, and

recombining what is already "out there" in some other form'.⁴⁵

The facility of AI-generative systems goes further than reorganisation of existing data structures. Some systems produce entirely original works which are far more advanced and intricate than those created by human authors. This results from the technological capabilities of the systems which stems from a human author's efforts in developing such systems, to wit:

In my own work, I visualise structures and concepts from a variety of mathematical fields, such as fractals (never ending patterns), cellular automata (grids), and computational geometry. In contrast to traditional art creation, in which people create from inspiration, I develop systems for generating art, ones that have built-in parameters that I can modify and tweak. Usually I will introduce randomness and variability into the system, a process that can lead to unexpected results. Sometimes I write scripts that generate thousands of candidate images with different parameter settings, from which I select the final piece.⁴⁶

Evidently, the works generated by uniquely-designed and built AI-generative systems satisfy the originality requirement. After all, the 'randomness' utilised by the system adds a creative spark to the work which is 'something that cannot be attributed to the human programmer of an AI machine'.⁴⁷

33 Sobel (n 9) 48

34 *ibid*

35 Berne Convention (32) art 2

36 Berne Convention (32) art 2

37 *Feist Publications, Inc v Rural Telephone Service Co*, 499 US 340, 340 (1991)

38 *ibid* [340]

39 Li (n 30)

40 Bridget Watson, 'A Mind of Its Own – Direct Infringement by Users of Artificial Intelligence Systems' (2017) 58 *IDEA* 65, 76

41 *ibid*

42 Contributors, 'Understanding the Impact of Artificial Intelligence on Music and Arts' (*Tech Financials*, 25 October 2017) <<https://techfinancials.co.za/2017/10/25/understanding-impact-artificial-intelligence-music-arts/>> accessed 15 November 2018

43 *ibid*

44 Yahong Li, Professor, University of Hong Kong, (Hong Kong, 27 September 2017)

45 *ibid*

46 Volz (n 25)

47 Hristov (n 27) 436

Third, the end-result of the AI-generative system produce Outputs which exemplify fixation in a tangible medium. AI-generated art generated by the system is a tangible result of the underlying expression.

Considering the foregoing, it appears that AI-generated Art is entitled to copyright protection since it satisfies the elements of eligible subject matter, originality, and fixation. However, it begets the question of whether copyright protection is most suitable for protecting AI-Generated Art.

Is Copyright Sufficient?

As discussed, copyright and other traditional intellectual property rights were developed to promote innovation and to protect the interest of humans by preventing theft which deprives the original creator from the benefits of his or her personal efforts.⁴⁸ However, the move from atoms to bits has consistently affected how traditional intellectual property rights are enforced. Particularly, it challenges legal protection and governance of technological advancements thus resulting to a shift in the essence of intellectual property protection.

Historically, it appears that most, if not all, innovations introduced by technological developments are forced into the confines of copyright protection. When computers made its first foray, academic scholars and jurists alike were lost on how to protect computer programs. This was resolved by the World Intellectual Property Organisation (WIPO) Copyright Treaty ('WCT') which extended copyright protection to computer programs 'whatever the mode or form

of their expression' and databases 'in any form, which, by reason of the selection or arrangement of their contents, constitute intellectual creations'.⁴⁹ Moreover, notable cases held that software is protected by copyright because of its source codes' visual similarities to written text.⁵⁰ Despite the convenience it presents, copyright is not a one-size fits all protection mechanism. It cannot be unnecessarily and forcibly be expanded to accommodate every new technological development, including artificial intelligence.⁵¹

Protection of AI-generated Art seemingly fits within the traditional copyright framework. However, an in-depth analysis will show that the law is 'being stretched to the maximum to accommodate disruptive consequences of the advent of artificial intelligence'.⁵² The rapid development of AI has led to a blurring of the distinction between art created by humans, and art created by machines. Computers have traditionally been used as tools to assist humans to create art. However, we are rapidly shifting to a world wherein computers themselves are now deemed as creators of art. While AI-Generated Art has certain similarities with contemporary art thus meriting copyright protection, AI-Generated Art and its underlying system do not exactly fit into the copyright system. Doing so may result to the utter disregard of the established principles of copyright and 'the very foundation of Intellectual Property law'.⁵³

The copyright system constricts AI-Generated Art into a mere vacuum. It disregards the striking peculiarities which distinguish AI-Generated Art from contemporary art. AI-Generated Art may be divided into two distinct categories: creation by direct guidance and autonomous creation.⁵⁴ The former is performed with the 'assistance or input of human beings', while the latter is produced by computer programs without any direct human intervention.⁵⁵ This distinction 'forces artificial intelligence into a binary – it is either a mystical author or a machine'.⁵⁶ This presents a host of issues, including ownership, and originality, should copyright protection be forced upon protecting AI-Generated Art.

Unlike contemporary art, AI-Generated Art does not necessarily have legally recognised authors who create the work which results to issues on ownership. Copyright law bestows ownership in the author of the work.⁵⁷ The author is defined as 'the person who effectively is, as near as he can be, the cause of the [work] which is produced, that is, the person who has

48 World Intellectual Property Organization, 'What is Intellectual Property?' <http://www.wipo.int/edocs/pubdocs/en/intproperty/450/wipo_pub_450.pdf> accessed 15 November 2018

49 World Intellectual Property Organization 'WIPO Copyright Treaty (WCT)' <<http://www.wipo.int/treaties/en/ip/wct/>> accessed 15 November 2018

50 *Sega Enterprises, Ltd v Richards* [1983] FSR 73

51 Andrea Moriggi, 'The Role of Intellectual Property in the Intelligence Explosion' <https://www.4ipcouncil.com/application/files/9615/1638/1031/The_Role_of_Intellectual_Property_in_the_Intelligence_Explosion.pdf> accessed 15 November 2018

52 *ibid*

53 *ibid*

54 Hristov (n 27) 435

55 *ibid*

56 Sobel (n 9) 49

57 Berne Convention (32) art 3

superintended the arrangement, who has actually formed the [work]⁵⁸. If the direct guidance of a human author results to AI-Generated Art, then ownership may be attributed to the human author who directed the Inputs and algorithms.⁵⁹ This is akin to a situation wherein a computer, used as a tool, has aided the generation of art

The problem arises when autonomous creation results to AI-Generated Art. This occurs when the Art-generative AI System learns to make decisions and create based on its own computations and recognised patterns,⁶⁰ or when ‘randomness and variability [are introduced] into the system, a process that can lead to unexpected results’.⁶¹ In this case, the Art-generative AI System shifts into the role of author or creator of the work which results to confusion. As discussed, ‘author’ pertains to an human author or an ‘actual individual who was responsible for creating the work’.⁶² This connotes that an author should have a legal personality who may be held legally responsible before the law. In the case of autonomously created AI-Generated Art, the Art-generating AI System does not have legal personality. It is considered as a non-human and is not an inventor or creator according to established Intellectual Property principles.⁶³ As such, it cannot own copyright over a work it has created. Absent a human author requirement, AI-Generated Art, in this case, is not copyrightable, and will likely fall into the public domain upon its creation.⁶⁴

While allowing these works to fall into the public domain may appear beneficial, it ultimately inhibits an author from creating and disseminating his or her work.⁶⁵ Falling into the public domain without due regard to an author may result to exposing such work to a culture of theft. It disregards the value of an author’s creative and innovative efforts since it neglects to provide him or her with fair and viable incentives to share his or her work.⁶⁶

The absence of clear ownership likewise leads to issues on the period of protection of the work. Copyrighted works generally enjoy protection during the life of the author plus fifty years after his or her death.⁶⁷ Without a legally recognised author, it will be impossible to establish a period of protection for the work and for the enjoyment rights attached thereto.

Another prevalent issue is originality. As previously discussed, originality is one of the essential requirements of copyright protection. This issue comes into play when the Art-generating AI System is fed with

Inputs comprising of unauthorised copies of copyrighted works.⁶⁸ This allows the System to train itself by ‘reduplicat[ing] and modif[y]ing [works] countless times throughout the training process’.⁶⁹ As a result, the System may generate art glaringly similar to an existing work since the System ‘sometimes reconstruct[s] idiosyncrasies of [I]nput data instead of reflecting underlying trends about those data’.⁷⁰ This raises the question of whether the doctrine of fair use may protect the use Inputs in the System. If not, then AI-Generated Art may find itself in a state of perpetual infringement.

Though seemingly appropriate, copyright is inadequate to protect AI-Generated Art. Its core principles on ownership and originality neglect to address the idiosyncrasies and ever-changing advancements of AI-Generated Art.

IV. Conclusion and Recommendation

Having established the inadequacy of the protection of traditional Intellectual Property framework on AI-Generated Art, the proponent submits that a *sui generis* framework (‘Framework’) may best protect the dynamic area of AI-Generated Art. The Framework aims to adequately protect AI-Generated Art by recognising the value of AI developers’ ‘investment of time and skills’⁷¹ and incentivising them ‘to continue creating, using, and improving their capabilities’⁷². The Framework should address the issues paramount to protecting AI-Generated Art, to wit:

58 Ralph D Clifford, ‘Intellectual Property in the Era of the Creative Computer Program: Will the True Creator Please Stand Up?’ (1997) 71 Tul L Rev 1675, 1685

59 Moriggi (n 51)

60 Watson (n 40)

61 Volz (n 25)

62 Clifford (n 58)

63 Moriggi (n 51) 7

64 *ibid*

65 Candidate 183 (n 29) 11

66 *ibid*

67 Berne Convention (32) art 7

68 Sobel (n 9) 48

69 Moriggi (n 51) 7

70 Sobel (n 9) 64

71 Hristov (n 27) 438

72 *ibid*

- (1) Comprehensively define Art-generative AI Systems and AI-Generated Art in order to elucidate the distinctions between AI-Generated Art created by direct guidance of humans and autonomous creation solely by the Systems;
- (2) Adapt traditional copyright protection for AI-generated Art created by direct guidance of human authors and developers akin to principles in computer-assisted works;
- (3) Address authorship and ownership issues, if any, of autonomously created AI-Generated Art by considering allocation of ownership and corresponding rights over AI-Generated Art to developers of AI-generative AI Systems with the aid of established principles of agency law and contract law;
- (4) Examine joint ownership of AI-Generated Art between developers and users of Art-generative AI systems to encourage advancement of rights;
- (5) Review suitable periods of protection of AI-Generated Art in line with rapid technological advancements in the field;
- (6) Promote the use of licensing methods to best ensure that Inputs used are authorised by copyright owners, and that AI-Generated Art are not unauthorised reproductions of existing works;
- (7) Establish rules on accountability to identify parties liable and degree of liability in case of infringement; and
- (8) Encourage compliance with the principles of Open Source and Creative Commons Licensing in order to promote constant innovation and creativity.

Ensuring ample protection of AI-Generated Art is vital to encourage constant innovation in the field. The time has come to acknowledge that humans are no longer the 'only source of innovation and creativity'⁷³. Akin to contemporary art, AI-Generated Art is likewise a creative manifestation deserving of protection. An absence of a protection framework has dire consequences – it will cause AI-Generated Art to immediately fall into the public domain, and its use may place it in a state of perpetual infringement. Failing to extend adequate protection to AI-Generated Art is a disservice to creativity and innovation and a blatant disregard 'of what is beautiful, appealing, or provocative'⁷⁴ as manifested in AI-Generated Art.

73 Hristov (n 27) 431

74 Volz (n 25)