

Artificial Intelligence and Canadian Copyright: The Quest for an Author

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SUMMARY

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*Désormais, l'artiste ne crée plus une œuvre, il crée la création.*¹
Nicolas Schöffner (1956)

1. Introduction

The craze created by artificial intelligence (“AI”) is obvious. Not a week goes by without an article being published on the subject, particularly in Montreal, a hub in this area.² Yet, artificial intelligence has its set of challenges. It presents ethical issues³ and raises legal questions, particularly with respect to civil and criminal liability,⁴ and copyright law;⁵ this last area is of interest to us in this paper. More specifically, we focus on the Canadian copyright framework for creations generated with artificial intelligence.

Although no definition of “artificial intelligence” is unanimously accepted today,⁶ it generally refers to a set of techniques designed to simulate human intelligence.⁷ Thus, artificial intelligence aims to enable machines to imitate human cognitive functions, such as understanding, reasoning, dialogue and communication.⁸ Despite the obvious infatuation with AI today, it is not a recent phenomenon.

Artificial intelligence originated in the works of Alan Turing, who was already questioning the cognitive functions of machines. In this regard, he developed a test to judge these abilities,⁹ which is still (sometimes)¹⁰ referred to today. Since the works of Turing, artificial intelligence has undergone important developments, first with the technique of “expert systems”, then with that of “deep learning”.

1 [Translation] “The artist does no longer create artworks; he creates the creative process”.

2 In particular, Montreal has retained the interest of major players in the private sector, such as Google and Microsoft, which are both working on deep learning in the city.

3 MACLURE (2017).

4 In Canada, see: VERMEYS (2018) and ELLYSON (2018).

5 In Canada, see: AZZARIA (2018) and LEBRUN (2018).

6 MANOLAKEV (2017), p. 20.

7 Dictionnaire Larousse, online: http://www.larousse.fr/encyclopedie/divers/intelligence_artificielle/187257.

8 See: AUBIN AND FREEDIN (2017), p. 1; DESROCHES AND JIANG (2017), p. 1 and MCCARTHY (2007).

9 The test is the following: “In the last analysis, the question of whether a computer can think or not can be answered in the affirmative if a human being, by asking it questions, could not tell from the answer whether he was interrogating a man or a machine”, TURING (1950).

10 Several researchers, including Yann Lecun, believe that the Turing test is out of date, and rather prefer the “Chinese room experience”, highlighted by John Searle. This experiment aims to show that an artificial intelligence system can only be a weak artificial intelligence and can only *emulate* consciousness. It also aims to show that the Turing test is insufficient to determine whether an artificial intelligence possesses intelligence comparable to that of man. See in particular: DEHAENE, LECUN, AND GIRARDON (2018), p. 154.

Expert systems were developed in the 1990s in order to replicate the human cognitive functions in specific areas. More particularly, such software constitutes a decision aid based on specific knowledge that a human being will have previously programmed. Such systems are therefore part of a specific referential framework, and do not have any particular autonomy.¹¹ The deep learning method, meanwhile, allows machines to perform some tasks in a (quasi) autonomous way thanks to an artificial neural network. The general principle underlying this approach is to let the machine discover by itself the optimal strategy for solving a problem, by providing it with a critical mass of data (sounds, images or texts).¹²

Today, artificial intelligence is all the rage because of the developments of the deep learning method (as well as the availability of greater volumes and sources of data).¹³ The first benefits of such advances came in 2012, with the development of the voice recognition application, Siri. Followed the Google Maps application which decrypts texts in landscapes, and Facebook which detects content deemed contrary to the terms of use of the platform. But the application of the deep learning method is much broader: it touches on areas such as health, energy, transportation, finance and arts.

For example, a “new Rembrandt” was created using artificial intelligence in 2016 as part of “The Next Rembrandt” project. With the use of the deep learning method, a new portrait was designed which, according to experts, could have been created by the Dutch painter.¹⁴ A similar application is the “Deep Dream Generator” which uses a neural network to find and enhance patterns in images. The application is trained on a vast data set of images to identify patterns (e.g., faces) and painting styles.¹⁵ In these two (2) scenarios, the systems emulate the style of pre-existing works. Most recent applications, however, have showed how AI can be used to create new works that depart from pre-existing ones. For example, the Creative Adversarial Networks system (“CAN”) creates works that show innovative elements while preserving a connection to given styles.

11 See: YANISKY-RAVID AND MOORHEAD (2017), pp. 675-678.

12 BERNARD (2017).

13 In this regard, the use of pre-existing works to feed and train algorithms poses other issues from a copyright perspective. Although this topic is not covered by this paper, it is worth noting that such problematic has been discussed in Canada during the recent statutory review of the Act. Among others, a proposal has been submitted to the government so that a new targeted exemption be created to allow for “informational analysis”.

14 AZZARIA (2018).

15 This must be distinguished from other tools developed by Google whereby, based on the acquired knowledge, the AI system transfers painting styles to images previously uploaded by end-users on the platform.

As such, artistic creations (which are, in appearance, like those produced by humans)¹⁶ are now generated with artificial intelligence, although humans play little to (almost) no role in the creative process.¹⁷ Yet, intellectual property, and more specifically copyright, does not appear to be designed to protect such type of creations; at least that is the conclusion of several foreign authors,¹⁸ while in Canada, an in-depth analysis of the matter is slow to begin. In this context, this paper aims to answer the following question: how does the Canadian copyright system protect such “artificial creations”?

2. Analysis

In Canada, it is generally recognized that four (4) specific requirements must be met for a creation to benefit from the protection afforded by the *Copyright Act*¹⁹ (the “Act”). First, the creation must fall into one of the categories of works listed in the Act (namely: literary, dramatic, musical and artistic works).²⁰ Then, the creation must be original²¹ and be fixed in some material form.²² Finally, the author must have been, on the date of creation, a citizen, subject or habitual resident of a country party to the *Berne Convention for the Protection of Literary and Artistic Works*²³ (the “Berne Convention”) or the *Universal Copyright Convention*,²⁴ or a member country of the World Trade Organization.²⁵ In addition

16 Authors say, by analogy, that the test enunciated by Turing would be successful. See: BOYDEN (2016), p. 378; BRIDY (2011), p. 12 and DENICOLA (2016), p. 269.

17 “[TRANSLATION] These achievements are made possible by the robot’s ability to make decisions freely through the accumulation of its autonomy and learning ability. [...] Humans no longer play the role of authors [...] but position themselves as assistants providing the necessary elements for the creative process.”, SOULEZ (2016), p. 1674.

18 See: CLIFFORD (1997); DENICOLA (2016), p. 271; SAMUELSON (1985), p. 1199, and YANISKY-RAVID (2017), p. 7.

19 *Copyright Act*, R.S.C., 1985, c. C-42 (the “Act”).

20 Act, § 5 (1).

Traditionally, only literary, dramatic, musical or artistic works were subject to protection under the Act. With the advent of new technologies, Canadian courts have, as far as possible, interpreted these four (4) categories liberally, so that new forms of expression such as computer programs are included (source code and object code being considered literary works). The legislator was soon adding elements to the list of examples of protected works contained in the Act. See: LAMOTHE-SAMSON (2002), p. 622.

21 Act, § 5 (1).

22 See: GENDREAU (1994), p. 154.

23 Berne Convention for the Protection of Literary and Artistic Works, 1886, online: <https://wipo.lex.wipo.int/en/treaties/textdetails/12214> (the “Berne Convention”).

24 *Universal Copyright Convention*, September 6, 1952, online: [Http://portal.unesco.org/fr/ev.php-URL_ID=15381&URL_DO=DO_TOPIC&URL_SECTION=201.html](http://portal.unesco.org/fr/ev.php-URL_ID=15381&URL_DO=DO_TOPIC&URL_SECTION=201.html).

25 Act, § 5 (1).

to these formal requirements, there is an informal one: the work must emanate from a (human) author.²⁶ In the AI field, we submit that the complexity lies (for the most part) in this last condition, the other not raising any particular issues.²⁷

2.1. Authorship

The author's position in the Act has evolved over the years: at first central, it would later have "moved into orbit".²⁸ In this sense, Canadian copyright has had to adjust to technological advances which have opened the Act to a "mosaic of groups of interests",²⁹ so that the interests of the author now coexist with those of users, educational institutions and Internet service providers (to name a few). Despite this plurality of actors, the author remains an important figure in the Act.³⁰ A discussion about this key player is therefore relevant: it allows us to better understand the complexity of the protection of artificial creations by the Canadian system, which, in our opinion, stems from the definition (or lack of definition) of the term "author".³¹

26 See: LAMOTHE-SAMSON (2002), p. 636.

27 It is true that originality also raises questions in the field of AI, but for the purposes of this paper, we submit that authorship and originality are corollary and that the latter is encompassed by our analysis of the authorship criterion.

28 AZZARIA (2013).

29 AZZARIA (2013).

30 In 1990, the Supreme Court of Canada eloquently recalled the author's central place in the copyright system: "The law has a single purpose and has been passed solely for the benefit of authors of all kinds", *Bishop v. Stevens*, [1990] 2 RCS 467.

The Federal Court also emphasized the importance of the author in 1998: "One should always keep in mind that one of the purposes of the copyright legislation, historically, has been to protect and reward the intellectual effort of the author (for a limited period of time) in the work. The use of the word 'copyright' in the English version of the Act has obscured the fact that what the Act fundamentally seeks to protect is 'le droit d'auteur'", *Tele-Direct (Publications) Inc. v. American Business Information, Inc.*, [1998] 2 C.F. 22, at § 37.

31 Although given in an American perspective, Buccafusco's comments also demonstrate the relevance of such analysis: "The lack of a coherent theory about the relationship between authors and writings in copyright law has created a number of difficulties over time. For example, without a theory of authorship, we cannot judge the boundaries of congressional power to extend copyright protection to new media. Does the constitutional grant empower Congress to provide copyright protection for a series of yoga poses or for a garden? In addition, without a theory of authorship, we cannot determine which aspects of a work are potentially copyrightable. When a programmer writes computer code, for example, what aspects of her behavior count as copyrightable authorship?", BUCCAFUSCO (2016), p. 1231.

2.1.1. Definition of “Author”

“What is an author?” asked Foucault in 1969, at a conference held at the Buffalo University. The question, at first philosophical, gradually entered the legal sphere. Although fundamental, the question nonetheless remains open, in the absence of a clear definition from the legislator. In this context, reference to the guiding principles set out by Canadian courts shall be made, in order to draw the outlines of the concept.

i. Conception and Execution

Copyright aims, first and foremost, to protect the *expression* of ideas and not the ideas themselves, which must flow freely.³² This principle, originally expressed in the 1875 *Copyright Act*,³³ no longer appears in the current version of the Act, but remains recognized in Canadian copyright and many decisions refer to it, in order to identify the author of a work.³⁴ As such, an “author” is the person who *expresses* his ideas in an “original” form;³⁵ it is the person who writes, draws or composes a work, through a “personal effort”.³⁶ On the other hand, merely providing an idea is not enough to qualify as an author.³⁷ For example, in *Gould Estate v. Stoddart Publishing Co.*,³⁸ the Court concluded that Glenn Gould was not the author of a book compiling several of his interviews, since his contribution was akin to providing mere ideas. Rather, the Court held that the author was

32 TAMARO (1994), p. 39.

33 The text reads: “Nothing contained in this act will prejudice anyone’s right to represent any scene or object, although there may be a private right for any other representation of the same scene or object.”, quoted in TAMARO (1994), p. 38.

34 See in particular the case *Moreau c. St. Vincent*, in which the Exchequer Court set out the principle in the following terms: “It is, I think, an elementary principle of copyright law that an author has no copyright in ideas but only in his expression of them. The law of copyright does not give him any monopoly in the use of the ideas with which he deals or any property in them, even if they are original. His copyright is confined to the literary work in which he has expressed them. The ideas are public property, the literary work is his own. Everyone may freely adopt and use the ideas, but no one may copy his literary work without his consent.” (our emphasis), *Moreau v. St. Vincent*, [1950] 3 D.L.R. 713.

35 *Goulet v. Merchant*, (September 18, 1985), Quebec 200-05-002826-837, J.E. 85-964, at § 19.

36 Fox (2003), Section 17.1.u.

37 “Because another makes suggestions to a dramatic producer, or to the author of a radio sketch of the nature of the one in question, it does not follow that the person to whom the suggestions were made is not the author of the work produced, or that it is not a work in which copyright may subsist. [...]. I think [the plaintiff] was the sole author. Any suggestions as to the general scheme of the sketch contributed by [the defendants] do not, in my opinion, suffice to give them a share in the copyright as joint authors with Kantel. It clearly was not a collective work. There is no evidence that any word or line of the sketch was produced by anyone other than Kantel. A person who merely suggests certain ideas without contributing anything to the literary or dramatic form of the copyright is not a joint author.” (our emphasis), *Kantel v. Grant*, 1933 R.C. de l’É. 84.

38 *Gould Estate v. Stoddart Publishing Co.* (1998), 80 C.P.R. (3d) 161.

the person who transcribed and compiled Gould's statements into a material form. Similarly, it was established that a person whose contribution is limited to providing stories to a journalist is not the author of the resulting papers,³⁹ and that a teacher providing general comments on the works of his students, cannot claim any authorship in such works.⁴⁰ As such, although an author is the one who "expresses his ideas into an original form", it is more precisely the person who *conceives* the work and ensures its *execution*: based on ideas, the author decides *which ones* to express (conception) and determines *how* to express them (execution).⁴¹

ii. Creative Control

Of course, an author may delegate creative tasks to a third-party; provided however that he remains the "mastermind".⁴² In particular, authorship will vest to the person who, while delegating certain parts of the creative process, nonetheless maintains control over the work's completion by its agent.⁴³ Such control will necessarily have to be linked to the very creative process; for that reason, a film producer, although holding a key role,⁴⁴ cannot claim any authorship, as his involvement is not of creative nature.⁴⁵ By contrast, a photographer who selects and arranges the costumes and other various accessories in a photograph, and disposes the light and shade, shall be considered the author of the photograph taken, rather than the assistant whose work merely consists in pressing the trigger.⁴⁶ Thus, participating in the creative process under the control of a third-party is not enough to claim any authorship.⁴⁷ If, on the contrary, the agent emanci-

39 *Evans v. Hulton Co.* (1924), 121 L.T. 534.

40 *Boudreau v. Lin* (1997), 75 C.P.R. (3d) 1.

41 GINSBURG AND BUDIARDJO (2019), p. 9.

42 GINSBURG (2003), p. 1072. "To determine who is the author of any particular type of work, such as a cinematographic work, one could also focus on the person or persons who are, in real terms, the "mastermind" of the work to be protected.", SOOKMAN (2017), Section 3.4.

43 "Attribution of authorship effectively follows general rules of agency: the physical acts of the agent are attributed wholly to the author under whose control and direction the amanuensis acts. The principal author 'controls' the amanuensis when the principal author influences not only *what* the amanuensis does, but *how* she accomplishes her task.", GINSBURG AND BUDIARDJO (2019), pp. 16-17.

44 LAROSE (2001), p. 32.

45 *Films Rachel inc. (Syndic de)*, (28 September, 1995), J.E. 95-2103.

46 *Ateliers Tango Argentin inc. c. Festival d'Espagne et d'Amérique latine inc.*, [1997] RJQ 3030.

47 "In my view, to have regard merely to who pushed the pen is too narrow a view of authorship. [...] It is wrong to think that only the person who carries out the mechanical act of fixation is an author.", *Kenrick v. Laurence*, (1890) 25 Q.B.D. 99.

"The term author [...] should not be equated with a mere scribe or copyist. [...] On the other hand, a person who simply gives ideas to another person is not the author.", *New Brunswick Telephone Co. v. John Maryon International Ltd.* (1982), 141 D.L.R. (3d) 193.

pates himself and shows a form of creative autonomy, he would likely qualify as an author. However, if control is exercised jointly, each party could (eventually)⁴⁸ claim joint authorship.

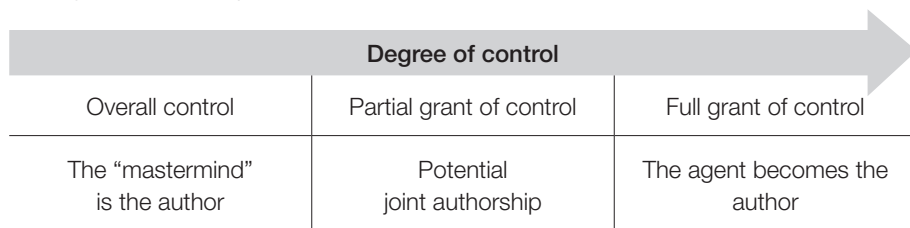


Figure 1: Control and authorship.

Decisive, the concept of control helps identifying who the author is. But is the status exclusive to humans?

2.1.2. Humanness of Authorship

The lack of legislative definition for the term "author" could open the door to a flexible interpretation of the concept, thus encompassing various actors (human or not).⁴⁹ Yet, a careful reading of the legislative texts (international and national) tends to favour an anthropocentric approach.

i. Legislative Interpretation

At the international level, the Berne Convention remains silent on the meaning of the term "author". Yet, Ricketson expresses the opinion that the text implicitly requires that the author be a natural person, in particular because of references to moral rights or the term of protection, which is based on the life of the author. At the national level, Lamothe-Samson developed a reasoning similar to that of Ricketson, considering certain provisions of the Act. In particular, the author concludes that the Canadian system presupposes a human author, in part because of the term of the protection⁵⁰ and the moral rights⁵¹ which are derived from the reflection of the author's personality in his work. It is also

48 See below "Section 2.2.2 – Authorship and Artificial Creations".

49 See: SHOYAMA (2005), pp. 129-140.

50 LAMOTHE-SAMSON (2002), p. 637.

51 Act, Section 14.1.

possible to contend that the citizenship criterion⁵² is likely to require some form of “humanity”.⁵³ Other authors argue that the copyright system only protects works created by humans, because of the interpretation given to the originality criterion. Indeed, the Supreme Court of Canada opted for the “skill and judgment” test⁵⁴ in 2004 which application tends to be limited to physical persons, since such abilities are exclusive to humans (at least for now).⁵⁵

ii. Philosophical Justification

In addition to these arguments which stem from the legislative texts, we submit that the “humanness” may also be justified by the founding theories of the Canadian system. Although the Act stems from the British regime (and its Lockean labour approach),⁵⁶ it also remains influenced by the civil system and in particular by the personality theory. Such personality theory is less concerned with compensating labour and focuses instead on protecting the emotional bond between the artist and his creation. Moral rights derive primarily from such personality theory and encompass an author’s rights to be credited for his work and to protect the integrity of his work.⁵⁷ The moral rights are thus the exclusive prerogative of the author; they preserve the natural connection between the work and its creator. Such “sacred right”⁵⁸ is also an essential factor in the individualization of a creation, making the natural person the only candidate likely

52 Act, Section 5.

53 It is true that in 2017, Saudi Arabia granted citizenship to a humanoid robot named “Sophia”. However, there is nothing less certain than that Canada will follow this path and broaden the notion of “citizen” to encompass robots.

54 “I conclude that the correct position falls between these extremes. For a work to be ‘original’ within the meaning of the Copyright Act, it must be more than a mere copy of another work. At the same time, it need not be creative, in the sense of being novel or unique. What is required to attract copyright protection in the expression of an idea is an exercise of skill and judgment. By skill, I mean the use of one’s knowledge, developed aptitude or practiced ability in producing the work. By judgment, I mean the use of one’s capacity for discernment or ability to form an opinion or evaluation by comparing different possible options in producing the work. This exercise of skill and judgment will necessarily involve intellectual effort. The exercise of skill and judgment required to produce the work must not be so trivial that it could be characterized as a purely mechanical exercise. For example, any skill and judgment that might be involved in simply changing the font of a work to produce ‘another’ work would be too trivial to merit copyright protection as an ‘original’ work.” (our emphasis), *CCH Canadian Ltd. v. Law Society of Upper Canada*, [2004] 1 S.C.R. 339, at § 16.

55 See DEHAENE, LECUN, AND GIRARDON (2018).

56 Locke viewed copyright as a natural right. According to his labour theory, the justification of copyright stems from the right of an individual to control the fruits of his labour.

57 Act, Section 14.1.

58 PIRIOU (2001).

to claim any authorship.⁵⁹ Yet, as further explained below, the role of the human creator has shifted in the context of artificial creations. How then can such creations be protected by copyright?

2.2. Authorship and Artificial Intelligence

Traditionally, copyright laws have been based on human creators⁶⁰ who control the creative process leading to an original work. But with the advent of AI systems, the role of such human authors seems to fade. In this respect, scholars who have discussed the protection of artificial creations made, for the most part, the assumption that any human creative input has become absent because of the (full) autonomy of the algorithms.⁶¹ As a result, they conclude that the works thus generated fall out of the copyright system. Yet, a deep look at the creative process reveals a *collaboration* between human artists and algorithms whose autonomy is in fact relative. Such atypical collaboration blurs the lines in copyright and makes it difficult to identify the author(s) of the resulting creation.

2.2.1. Artificial Creations

The integration of learning algorithms into the creative process, taking with it a shift in the role of the artist, is part of the “generative art” movement. A brief description of this form of art is of importance as it highlights the respective roles of both the (human) artist and the algorithms.

i. Generative Art

For Galanter, generative art is “any art practice where the artist uses a system, such as a set of natural language rules, a computer program, a machine, or other procedural invention, which is set into motion with some degree of autonomy contributing to or resulting in a completed work”.⁶² Similarly, McCormack explains that generative art “focuses on the process by which an artwork is

59 PIRIOU (2001).

60 According to Professor Ginsburg, in the United States, the United Kingdom, Australia, Canada, France, Belgium and Holland, the author is the human being who exercises a subjective judgement in the composition of his/her work and who controls its execution: GINSBURG (2003).

See also: YANISKY-RAVID AND VELEZ-HERNANDEZ (2017).

See however: MILLER (1993), p. 1067 and RALSTON (2005), p. 301.

61 See, for example: HRISTOV (2017), p. 431; YANISKY-RAVID AND VELEZ-HERNANDEZ (2017), and YU (2017), pp. 1245-1270.

62 GALANTER (2003).

made, and this is required to have a degree of autonomy and independence from the artist who defines it".⁶³ On her end, Boden describes the movement as encompassing works that have been "produced by the activation of a set of rules and where the artist lets a computer system take over at least some of the decision making".⁶⁴ One may think, for example, about the AARON program whose designer encoded specific artistic techniques, in addition to integrating into the database several basic forms. The program then painted creations without specific instructions, often during the sleep of its programmer.

Considering the above, the (human) artist creates the "foundations" of the creative process, that is to say the rules according to which creations are produced. In this respect, although she does not explicitly refer to generative art, Ginsburg stresses that humans will be able to provide instructions to the program not only upstream (i.e., via the programmer or the person training the algorithm), but also downstream. (i.e., via the user of the AI system). The above definitions also outline the (relative) autonomy of the technology being used which, in the context of AI, stems (in part) from the deep learning process.

ii. Relative Autonomy

According to Yanisky-Ravid and Velez-Hernandez, autonomy presupposes the ability to generate a creation independently of any human intervention.⁶⁵ Yet, and as Miller rightly pointed out, behind every robot there is a human being.⁶⁶ Indeed, deep learning requires that someone programs the algorithm and "feeds" the system with a large amount of data in order to generate a creation. In Bonnet's terms, a "matrix of thought"⁶⁷ is thus programmed, from which the algorithm makes decisions. The decision-making process is particularly advanced in the field of deep learning, as the AI systems have reasoning modes that allow them to improve the accuracy of their diagnosis, as well as the effectiveness of their actions as they integrate more data.⁶⁸ As such, the autonomy is limited to the decision-making process⁶⁹ of the deep learning system. Nonetheless, such

63 MCCORMACK, BOWN, DORIN, MCCABE, MONRO AND WHITELAW (2013).

64 BODEN (2010), p. 129.

65 YANISKY-RAVID AND VELEZ-HERNANDEZ (2017).

66 MILLER (1993).

See however: YANISKY-RAVID AND MOORHEAD (2017): "However, once we understand how AI systems work, we realize that, for almost the first time in history, there is no human behind the creative process."

67 BONNET (2015), p. 6.

68 BONNET (2015), p. 7.

69 "[TRANSLATION] Autonomy supposes that the agent takes initiative and acts independently, without human intervention. The agent will search for and process the information relevant to its objectives alone and, if necessary, make the necessary decisions without prior reference.", KABKAN (2008), pp. 246-247.

(relative) autonomy makes it hard for the artist to predict with precision the result generated by the system,⁷⁰ thereby making it (eventually) difficult for such artist to claim any authorship over the output.

2.2.2. Authorship and Artificial Creations

The use of technology to create works is not new. However, as technology has developed, we have seen our relationship with it change and the technology's role shift from that of a tool under the direct control of the artist to that of a "collaborator" or creative partner and, potentially, an autonomously creative entity⁷¹. Such continuum⁷² may be schematized as follows:

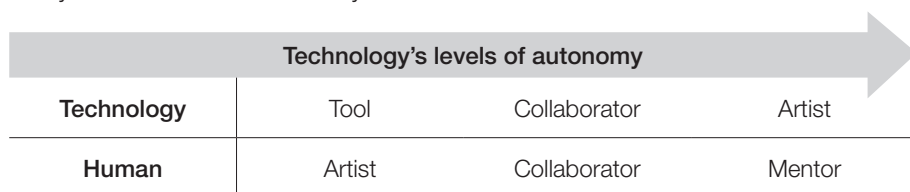


Figure 2: Technology evolution spectrum. Adaptation of the figure from Jon McCORMACK *et al.*, "Levels of creativity between a computer and a human."⁷³

i. The Two Extremes: AI Systems as "Artists" and Tools

As set forth above, AI systems do not currently have full autonomy; it follows that they cannot create without human intervention or realize creations that go beyond what they were programmed for.⁷⁴ As a result, the case shown at the extreme right of the above figure remains science fiction (at least for now). Should, however, algorithms become fully autonomous, their creations would fall in the public domain in the absence of any human author,⁷⁵ since the copyright system only protects "original" works made by *human* authors:

70 "AI systems are based on algorithms capable of incorporating random input, resulting in unpredictable routes to the optimal solution, and hence creating unpredictable works [...]. An AI system can draw a new painting, which, unlike copying an existing work, is unpredictable. After being exposed to colours, shapes, and techniques [...], the system can 'break' the data into digital components, recompose them, and create new and unexpected artworks", YANISKY-RAVID AND VELEZ-HERNANDEZ (2017).

71 MCCORMACK, BOWIN, DORIN, MCCABE, MONRO, AND WHITELAW (2013).

72 TESSIER (2015).

73 MCCORMACK, BOWIN, DORIN, MCCABE, MONRO, AND WHITELAW (2013).

74 GESTIN-VILLION (2017), p. 25.

75 In France, see: SOULEZ (2016). In the United States, see: BUTLER (1981), pp. 733-734; HRISTOV (2017), and YANISKY-RAVID AND VELEZ-HERNANDEZ (2017).

“Non-Human creations are in most cases expressly taken out of copyright protection ab initio. No matter whether we considered that the work itself has creativity, according to most national laws [...], the work created by a non-human author can never be considered as a copyright protected work and [is] therefore excluded of any kind of monopolistic right in favor of its author. In this sense, once the machine has “learned” to create autonomously, according to the law, the results of this process could fall out of the scope of copyright protection [...], no matter how much value may these paintings have in the market or how relevant they might be in economic or industrial terms.”⁷⁶ (our emphasis)

Conversely, the use of technologies as a tool is more common; Boden describes this case as “computer-assisted art”.⁷⁷ This would be the case, for example, of the use of a camera, an expert system or a Photoshop software to adjust an image colour. In such cases, the technology is not essential to the creative process, but rather acts as a support under the direct control of the artist.⁷⁸ As a result, the use of such instrument does not pose any problems in terms of copyright, and the authorship will vest in the artist, that is, the physical person who controls the conception and the execution of the work.⁷⁹ When, however, the technology is used as a “collaborator” in the context of “generative art”, such collaboration tends to blur the line and this grey area is where most problems for now lie.

ii. The Middle of The Scale: AI Systems as Collaborators

In the AI field, several actors (may) participate in the creative process, namely: the programmer, the trainer of the algorithm, the user and the “algorithm”. To determine whether the creation resulting from such “collaboration” may be protected under the Canadian copyright system, one should ask who controlled the creative process?

In some instances, the identification of the “mastermind” of the creative process does not pose any issue, as in the case of “The Next Rembrandt”. Indeed, in such case, the (human) programmers conceived and controlled the overall execution of the work: they selected the paintings to train the algorithms, and provided the proper instructions to produce the textures and layers necessary for “The Next Rembrandt” to have the painterly presence of a work made by the

76 GUTIÉRREZ, OLIVAS, PUENTE AND RUIPÉREZ (2017).

77 “The computer is used as an aid (in principle, not essential) in the art-making process”, BODEN (2010).

78 BODEN (2010).

79 See: GINSBURG AND BUDIARDJO (2019).

Dutch master. As a result, this artificial creation would be protected by copyright and the authorship would vest in the programmers. Yet, some may argue that because the output was, to some extent, *unpredictable*, it should fall in the public domain.

Canadian courts made it clear that purely unpredictable processes (such as sports games)⁸⁰ will not be protected by copyright, since the system needs some certainty.⁸¹ However, the Act does not exclude creations whose process involves some randomness; provided, however, that the creator maintains an overall control over the creative process⁸² and has some form of consciousness of the output.⁸³ In the case of “The Next Rembrandt”, the general parameters of the work were well defined beforehand by the programmers who had an overall idea of the outcome. This is, to some extent, similar to Pollock’s “drip paintings”. Indeed, Pollock did not anticipate the precise trajectory and landing points of his paintings, but “copyright law would not doubt his authorship of his occasionally aleatory output”⁸⁴ since the painter had control over the creative process as well as an overall idea of the result.

In the case of the CAN algorithm, however, the presence of innovative elements makes the output even more unpredictable.⁸⁵ Yet, one could argue that such randomness has been programmed and that the output, although unpredictable, “is the direct brainchild of some human developer [...]”.⁸⁶ As a result, if the programmers have formulated a creative plan using skill and judgement (conception), which directly leads to the creation (execution), such creation can be afforded a protection (in which case the authorship would likely vest in the

80 “Even though sports teams may seek to follow the plays as planned by their coaches, as actors follow a script, the other teams are dedicated to preventing that from occurring and often succeed. As well, the opposing team tries to follow its own game plan, which, in turn, the other team tries to thwart. In the end, what transpires on the field is usually not what is planned, but something that is totally unpredictable. That is one of the reasons why sports games are so appealing to their spectators. No one can forecast what will happen. This is not the same as a ballet, where, barring an unforeseen accident, what is performed is exactly what is planned. No one bets on the outcome of a performance of *Swan Lake*. Ballet is, therefore, copyrightable, but team sports events, despite the high degree of planning now involved in them, are not.”, *FWS Joint Sports Claimants c. (Canada) Copyright Board* (1991), 36 C.P.R. (3d) 483, at § 10.

81 “It is necessary for copyright not to have ‘changing materials’ that are ‘lacking in certainty’ or ‘unity’, even though some variations could be permitted”, *FWS Joint Sports Claimants c. (Canada) Copyright Board* (1991), 36 C.P.R. (3d) 483, at § 10.

82 See: *Rains v. Molea*, 2013 ONSC 5016, at § 12.

83 We argue that the originality test (i.e., the “skill and judgment” test) requires a form of discernment and consciousness. See: *CCH Canadian Ltd. v. Law Society of Upper Canada*, [2004] 1 S.C.R. 339, at § 16.

84 GINSBURG AND BUDIARDJO (2019).

85 See: ELGAMMAL (2017).

86 GINSBURG AND BUDIARDJO (2019).

programmers).⁸⁷ As such, the use of AI systems which leads to creations incorporating some form of randomness does not necessarily yield uncertainty with regards to copyright protection. In fact, the complexity of the problem lies in the plurality of actors that may be involved in the creative process.

Despite the apparent “collaboration” of the programmer, the trainer, the user and the AI system, in most cases, the work will not qualify as a “work of joint authorship”⁸⁸ under the Act because of the lack of each collaborator’s intent to incorporate their respective contributions into a final work⁸⁹ (and, according to some case law, to consider themselves co-authors).⁹⁰ Indeed, most of the time, the programmer and the trainer, on one hand, and the user of the algorithm, on the other hand, will not consult with each other. This might be the case, for example, of someone using the “Deep Dream Generator”. In such case, the user inserts an image into to the “Deep Dream Generator” program, which uses a deep learning model to modify the image by detecting patterns in such image.⁹¹ But by merely supplying the initial content, the user exercises no influence over the resulting work. The programmer and the trainer, on the other hand, control the process through which the resulting work comes into being.⁹² However, they do not exercise any control over how the “creative” process works and cannot anticipate the outcome. In fact, it is unlikely that they ever exercise any “skill and judgement” with respect to the specific modified image. To some extent, this is like Google Translate where a user inserts a text but does not exercise any influence over the translated text,⁹³ and where the programmer and the trainer,

87 By analogy, see Ginsburg and Budiardjo’s analysis on AARON’s paintings: GINSBURG AND BUDIARDO (2019), pp. 69ff.

In Canada, see: *Geophysical Service Incorporated v Encana Corporation*, 2016 ABQB 230, where the Court held that seismic data are protected by the Act, despite the use of many technical instruments in the production of such data, since the process was not merely automated but required human intervention, in the form of expert scientific skill and judgment to make them work.

88 “Definitions: (...) ‘work of joint authorship’ means a work produced by the collaboration of two or more authors in which the contribution of one author is not distinct from the contribution of the other author or authors; (oeuvre créée en collaboration)”, Act, Section 2.

89 See: *Drapeau c. Carbone 14*, [2000] J.Q. n° 1171; *Neudorf v. Netzwerk Productions*, 1999 CanLII 7014, and *Seggie c. Roofdog Games Inc.*, 2015 QCCS 6462.

90 See: DANIEL (2016), p. 237.

91 The program finds and enhances by itself patterns in images via algorithmic pareidolia, thus creating a dream-like hallucinogenic appearance in the deliberately over-processed images; see: <https://en.wikipedia.org/wiki/DeepDream>.

92 As a result, they might eventually claim (joint) authorship over the process; provided however that such process meets the other criteria set by the Act.

93 Ginsburg and Budiardjo add that “[t]wo users who input the same text into Google Translate will get the same result, and neither user can tweak Google’s algorithm to create a different output given the same input. Google Translate does not provide any user-defined parameters for users to change *how* the translation algorithm works – users cannot ask the algorithm to favor certain phrasings or resolve translational ambiguities in a particular way.”, GINSBURG AND BUDIARDO (2019), p. 93.

do not control how the translation works and cannot anticipate the outcome. As a result, both the “Deep Dream” image and the translated text might simply be authorless and fall outside the scope of protection of the Act.

Under these circumstances, one could argue that the authorship shall vest to the person who *intended* to produce the creation, and this would be, in most cases, the user of the AI system. Yet, the Act, not defining the term “author”, imposes even less any criteria of intent to qualify as an author. Indeed, Canadian courts do not appear to have imposed intentionality as a requirement to qualify as an author, at least with respect to “individual” works. In this sense, it is true that the intent is analysed in the context of works of joint authorship in which case, the focal point, according to Ginsburg, is shifted to the *co-ownership* (as opposed to the *creative* intent).⁹⁴ By contrast, in the context of “individual” works, the intent will not be decisive, as the courts will “solely” identify the person who expressed his ideas into an original form.⁹⁵ As such, the protection of artificial creations may not be contingent to human’s intent since this factor is not conclusive. Others therefore argue that if the final work is indistinguishable from a human creation, it should have the same legal status as one created by a human, regardless of the creative process.⁹⁶ Such argument, however, would be in contradiction with several principles of Canadian copyright. In particular, it is well established that Canadian courts will not judge the artistic/aesthetic merits of a work but will rather evaluate the creative *process*.⁹⁷ As a result, when it becomes impossible to identify any (human) authors in the context of artificial creations, such works would simply fall out the protection of the Act and enter the public domain, despite their appearance.

3. Conclusion

Most scholars conclude that artificial creations may not be protected by copyright. For them, the laws require a human creative imprint which is, to them, absent from the AI creations. Yet, such conclusion presupposes that AI systems

94 “Intent, I suggest, does not make a contributor more or less creative, but it may supply a means to sort out the equities of ownership in cases in which more than one contender is vying for authorship status. There, the problem is not so much whether the contenders intended to be creative, as if they intended to share the spoils of creativity, that is, whether they intended to be joint owners of the copyright.” (our emphasis), GINSBURG (2003), p. 1087.

95 One may think here about Marcel Duchamp’s ready-mades which were found objects that Duchamp chose and presented as art. Despite the artist’s intent to present such objects as works of art, they would not qualify as protectable works under the Act given their lack of originality.

96 See: LARRIEU (2013), p. 125, and PIRIOU (2001).

97 See: TAMARO (1994), p. 89.

are fully autonomous which is not the case (at least for now). In fact, algorithms should be seen as “collaborators” that help produce new creations. How then does the Canadian copyright system protect (or not) creations made through such “collaboration”? We submit that (part) of the answer lies in the identification of the “author” whose definition encompasses several attributes as per the following table:

Table 1: Artificial intelligence and copyright: the quest for an author.

Criteria	Comments	AI and Copyright: The Quest for an Author
Conception and execution	An author is the person who conceives the work and ensures its execution.	Despite the “collaboration” between algorithms and humans in the field of AI, authorship will only vest to the physical person(s) who conceived and executed the work.
Creative Control	Although an agent may execute specific tasks during the creative process, the author must nonetheless maintain general control over such process as the “mastermind”.	Despite the (relative) autonomy of AI systems, physical persons remain in control of the overall creative process.
Unpredictability	Creations whose process involves <i>some</i> randomness may be protected; provided, however, that the author maintains an overall control of the creative process and has some consciousness of the output.	The fact that artificial creations are unpredictable is not problematic if the (human) author(s) has/have some form of consciousness of the output.
Intent	Intent is not a determining factor in copyright. In the case of individual works, a creator without creative intent can indeed claim authorship over his work (as long as the other conditions are met).	Intent is only relevant in the context of AI to assess whether artificial creations qualify as “works of joint authorship”.

In the AI ecosystem, one can perceive the algorithms as new “creative collaborators”. Yet, considering the above criteria, such agents cannot benefit from the author status. The authorship shall therefore be attributed to either

the programmer, the trainer of the algorithm, the user, or all of them. When it becomes impossible to identify an author or joint authors, such as in the case of the “Deep Dream Generator” or Google Translate, the output then falls out of the scope of the Act, regardless of the creative intent or the appearance of the creation. In such case, a new question arises: should we adjust the copyright system to welcome such creations and if so, to whom shall we attribute the ownership of such creations?

As of today, we found no Canadian discussion on this topic although several foreign scholars wrote on this matter.⁹⁸ In particular, most of them have proposed to review their respective copyright regimes, in order to protect artificial creations. Among the proposals, we have identified two (2) trends: the first relates to the creation or amendment of existing legal fictions (such as the work made for hire doctrine in the United States);⁹⁹ the second is to revisit the originality criterion.¹⁰⁰ Although this paper does not address such problematic, these suggestions open the door to Canadian thinking about the possibility to protect “authorless” AI creations. Yet, it should be reminded that, before embracing any of these proposals, Canada should first ensure that any adjustment to its regime echoes the purposes and foundations of the system, which responds to an economic logic, but also to a personalist one that positions the human author at the heart of the system.

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98 See, for example: DENICOLA (2016); RALSTON (2005) and SAMUELSON (1985).

99 See, for example: BRIDY (2011) and HRISTOV (2017).

100 See, for example: LARRIEU (2013) and PIRIOU (2001).

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