FOSTERING EXPRESSIVE KNOWLEDGE: THE COPYRIGHTABILITY OF COMPUTER-GENERATED WORKS IN CANADA

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ABSTRACT

Artificial intelligence systems can now produce complex artistic and literary works without human authorial contribution. Considering the absence of authorship, these works are currently not covered by copyright law in Canada. In past decades, many scholars argued for their protection, with their claims relying mainly on the economic arguments. Building on this literature, this Article will anchor the propositions in the economic objective of Canadian copyright law, through the principle of the balance of interests developed in Théberge by the Supreme Court of Canada. Under this approach, copyright law aims to encourage both the production and distribution of creative works sharing expressive knowledge to society. Since computer-generated works also include expressive knowledge, this Article will suggest that it can be coherent to grant limited economic rights to the persons who arrange them. This can incentivize these "arrangers" to make computer-generated works available to the public.

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I. INTRODUCTION

With new breakthroughs in artificial intelligence (AI) research, it is not foolish to expect that, in the near future, bestselling novels could be written by trained software,[1] movie soundtracks could be composed by algorithms,[2] and the next Chagall could be a droid.[3] With minimal human creative participation, AI systems can now produce complex literary and artistic works such as poetry, short stories, paintings, and music.[4] The quality of some

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[1] *See* Sam Hill, *A Neural Network Wrote the Next 'Game of Thrones' Book Because George R.R. Martin Hasn't*, VICE: MOTHERBOARD (Aug. 28, 2017), motherboard.vice.com/en_us/article/evvq3n/game-of-throne s-winds-of-winter-neural-network [https://perma.cc/72CW-JT82].

[2] *See* Stuart Dredge, *AI and Music: Will We Be Slaves to the Algorithm?*, THE GUARDIAN (Aug. 6, 2017), www.theguardian.com/ technology/2017/aug/06/artificial-intelligence-and-will-we-be-slaves-to -the-algorithm [https://perma.cc/43S6-BDFZ].

[3] *See Project: Abstract*, E-DAVID: A PAINTING PROCESS, graphics.uni-konstanz.de/eDavid/?page_id=2 [https://perma.cc/4DK8-UGR8] (last visited Mar. 16, 2020).

[4] *See* SELMER BRINGSJORD & DAVID A. FERRUCCI, ARTIFICIAL INTELLIGENCE AND LITERARY CREATIVITY: INSIDE THE MIND OF BRUTUS, A STORYTELLING MACHINE 124 (2000) (providing an example of a short story written by an AI system); Matthew Hutson, *How Google is Making Music With Artificial Intelligence*, SCIENCE MAG. Aug. 8, 2017, www.sciencemag.org/news/2017/08/how-goo gle-making-music-artificial-intelligence [https://perma.cc/SUZ7-F476]; Teresa Riordan, *Patents; Investor Creates Software That Can Turn a*

works generated by computers is even comparable to the ones authored by skilled humans. AI disrupts the very idea of creation, an activity that has always been exclusive to humans' genius. As this Article will expose, it is not clear, despite their extrinsic qualities, whether copyright law boundaries can encompass computer-generated works. Copyright protection has been historically granted in creative works authored by humans. Deciding how to regulate such works is thus crucial to clarify the situation for both investors and consumers.[5] However, it is even more essential to ensure that the possible extension of copyright to computer-generated works is compatible with its policy objectives.

In this Article, I will assert that including computer-generated works in the scope of Canadian copyright law may be justified since its purpose is mainly economic, following the principle of the balance of interests developed in *Théberge*.[6] Copyright primarily aims to encourage the production and distribution of creative works

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Computer Into a Cyberpoet, N.Y. TIMES (Nov. 24, 2003), http://www. nytimes.com/2003/11/24/business/patents-investor-creates-software-tha t-can-turn-a-computer-into-a-cyberpoet.html [https://perma.cc/T66T-6 VRP]; Steve Schlackman, *Who Holds the Copyright in Computer Generated Art*, ARTREPRENEUR ART L.J. (Apr. 22, 2018), https://artlaw journal.com/the-next-rembrandt-who-holds-the-copyright-in-computer-generated-art [https://perma.cc/R72C-AFZR].

[5] Can. House of Commons, *Examination Under the Law of the Copyright Act: Report of the Standing Committee on Industry, Science and Technology*, 56, https://www.noscommunes.ca/DocumentViewer/ fr/10537003 [https://perma.cc/4BY9-DUV7] (June, 2019) (discussing that Parliament should enact legislation to help Canada's promising future in artificial intelligence become reality. Our own legislation, perhaps informed by approaches taken in other jurisdictions, can be adapted to distinguish works made by humans with the help of AI software from works created by AI without human intervention.).

[6] Théberge v. Galerie d'Art du Petit Champlain Inc., [2002] 2 S.C.R. 336 (Can.).

sharing expressive knowledge to society.[7] Therefore, it can be coherent to grant a limited copyright to persons participating in the production and dissemination of computer-generated works, which include aesthetic features comparable to human-authored ones. Few scholars have considered this question under the perspective of Canadian law, so this Article can be an interesting addition to the growing literature.[8] Since they have similar roots with Canadian copyright law, I will mainly review scholarly articles from Anglo-American jurisdictions, such as the United States, the United Kingdom, and Australia.[9]

In Part II, I will first survey the technologies underlying AI systems, especially the ones producing artistic and literary works. It will provide sufficient insights to conclude that works created by AI systems are not authored by humans in the sense intended by copyright law. In Part III, I will thus support, in reviewing Canadian copyright law, that computer-generated works are excluded

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[7] Maxence Rivoire & E. Richard Gold, *Propriété Intellectuelle, Cour Suprême du Canada et Droit Civil*, 60 MCGILL L.J. 381, 392 (2015).

[8] *See* James Wagner, *Rise of Artificial Intelligence Author*, 75 ADVOC. (VANCOUVER) 527 (2017); Mark Perry & Thomas Margoni, *From Music Tracks to Google Maps: Who Owns Computer-Generated Works?*, 26 COMPUT. L. & SEC. R. 621 (2010); Rex M. Shoyama, *Intelligent Agents: Authors, Makers, and Owners of Computer-Generated Works in Canadian Copyright Law*, 4 CAN. J.L. TECH. 129 (2005). These three articles focus on the inclusion of computer-generated works within Canadian copyright law, though their scopes remain limited. This Article focuses on the policy justification for anchoring the protection of computer-generated works in the economic rationale for copyright law.

[9] *See* Myra J. Tawfik, *Copyright History as Book History: The Law in Multidisciplinary Context*, *in* RESEARCH HANDBOOK ON COPYRIGHT LAW 31, 43 (Paul Torremans ed., 2d ed. 2017); Sara Bannerman, *Copyright: Characteristics of Canadian Reform, in* FROM "RADICAL EXTREMISM" TO "BALANCED COPYRIGHT": CANADIAN COPYRIGHT AND THE DIGITAL AGENDA 17–18 (Michael Geist ed., 2010).

from its realm. Under the current regime, only human authors can fulfill the originality criterion required to gain copyright protection.[10] Nonetheless, I will note that the absence of human authorship does not necessarily preclude the expansion of the Canadian *Copyright Act* to works lacking human input. Copyright law has always been flexible so as to incorporate works created with the support of the inventions of the time (e.g. photography, sound recordings, and cinematographic works).[11] Some rights are even allocated to non-authors.[12] It is thus conceivable that the Copyright Act can encompass computer-generated works.

In Part IV, to circumscribe the debate on the copyrightability of these works and clarify the contribution of this Article, I will survey the Anglo-American literature on this question and its surprising emergence almost forty years ago.[13] Starting in the early 1980s, the first scholarly articles mostly support the inclusion of computer-generated works in copyright law.[14] For many, computers were still

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[10] CCH Canadian Ltd. v. Law Society of Upper Canada, [2004] 1 S.C.R. 339 (Can.); DAVID VAVER, INTELLECTUAL PROPERTY LAW 115 (2011).

[11] Burton Ong, *Finding Originality in Recreative Copyright Works, in* THE COMMON LAW OF INTELLECTUAL PROPERTY: ESSAYS IN HONOUR OF PROFESSOR DAVID VAVER 255, 255 (Catherine W. Ng et al. eds., 2010).

[12] VAVER, *supra* note 10, at 97; Ong, *supra* note 11, at 255.

[13] Tawfik, *supra* note 9, at 35 (discussing Canadian legal tradition).

[14] Timothy L. Butler, *Can a Computer be an Author: Copyright Aspects of Artificial Intelligence*, 4 HASTINGS COMM./ENT. L.J. 707, 747 (1982); Pamela Samuelson, *Allocating Ownership Rights in Computer-Generated Works*, 47 U. PITT. L. REV. 1185, 1192 (1986); Arthur R. Miller, *Copyright Protection for Computer Programs, Databases, and Computer-Generated Works: Is Anything New Since CONTU*, 106 HARV. L. REV. 977, 1066–67 (1993); *see also* Evan Farr, *Copyrightability of Computer-Created Works*, 15 RUTGERS COMPUT. & TECH. L.J. 63, 80 (1989).

considered tools assisting humans in their creative endeavors.[15] However, over the years, the understandings of AI technologies and the concept of copyright originality have evolved, so doubts about the actual human contribution grew amongst scholars.[16] Nevertheless, it did not prevent several scholars from continuing to propose frameworks for their inclusion in copyright law. They mainly rely on their similarities with human-authored ones and claim that such measures have already been taken by some countries such as the United Kingdom.[17]

Finally, in Part V, building on this literature, I will anchor their propositions in the economic objective of Canadian copyright law. I will assert that the inclusion of computer-generated works may be compatible with copyright instrumentalist aims since they can be as equally

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[15] National Commission on New Technological Uses of Copyrighted Works [CONTU], *Final Report on New Technological Uses of Copyrighted Works* 44 (1979), http://digital-law-online.info/CONTU/PDF/index.html [https://perma.cc/2FLR-TCBW] [hereinafter *CONTU Final Report*].

[16] *See CCH*, [2004] 1 S.C.R. 339, at para. 14 (defining the originality requirement in Canada); *Feist Publ'ns v. Rural Tel. Serv.*, 499 U.S. 340 (1991) (defining the originality requirement in the United States); *IceTV Pty. Ltd. v Nine Network Australia Pty. Ltd.* [2009] 239 CLR 458 (Austl.) (defining the originality requirement in Australia); *Telstra Corp. v Phone Directories Co. Pty.* [2010] FCA 44 (Austl.); *Telstra Corp. v Phone Directories Co. Pty.* (*Telstra Appeal*) [2010] FCAFC 149 (Austl.).

[17] *See* Annemarie Bridy, *The Evolution of Authorship: Work Made by Code*, 39 COLUM. J.L. & ARTS 395, 399 (2016) (discussing the similarities with human-authored works) [hereinafter Bridy, *The Evolution of Authorship*]; Andres Guadamuz, *Do Androids Dream of Electric Copyright? Comparative Analysis of Originality in Artificial Intelligence Generated Works*, 2 INTELL PROP. Q. 169, 186 (2017) (discussing the U.K. provision); Jani McCutcheon, *The Vanishing Author in Computer-Generated Works: A Critical Analysis of Recent Australian Case Law*, 36 MELB. U. L. REV. 915, 954 (2013) (discussing the similarities with human-authored works).

valuable as human-authored ones and, more importantly, their protection can incentivize the multiplication of creative works. Therefore, I will suggest the granting of a limited economic right, under a regime akin to neighboring rights, to the persons who arrange the production of computer-generated works.[18] These "arranger's rights" would both acknowledge the absence of authorship and incentivize arrangers to make the works available to society, thus fostering creative knowledge.

II. ARTIFICIAL INTELLIGENCE: THE CREATIVE MACHINE

A. *Artificial Intelligence: Definition and Background*

To determine the copyrightability of computer-generated works, it is first essential to understand the AI technology underlying their existence. An AI system can be defined as a program that can "make computers[] do the sorts of things that [human] minds can do."[19] It should have the capacity to emulate human behavior by adequately analyzing the information it receives.[20] A machine that can assemble words to produce readable texts can be considered an AI system since it simulates the skills of a human writer. Replicating the human mind is, however, not something simple to achieve.

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[18] *See* Ana Ramalho, *Will Robots Rule the (Artistic) World? A Proposed Model for the Legal Status of Creations by Artificial Intelligence Systems*, 21 J. INTERNET L. 12, 22 (2017).

[19] MARGARET A. BODEN, AI: ITS NATURE AND FUTURE 1 (2016) [hereinafter BODEN, AI].

[20] JERRY KAPLAN, ARTIFICIAL INTELLIGENCE: WHAT EVERYONE NEEDS TO KNOW 5 (2016).

1. 1970s-1980s: The Expert Systems

In the mid-1970s, researchers developed the first effective AI systems that could emulate the knowledge of a human expert in a precise domain: the expert systems.[21] An expert system consists of the modelization of programmers' personal expertise into a set of logical rules and a knowledge base.[22] For example, in the building of such a system that can write short stories, programmers have to include the English vocabulary, the syntax rules, and the narrative rules in the knowledge base. If successful, this expert system will be able to make deductions from the rules in the database and provide enjoyable stories to the reader.

These systems have been used to generate quite astounding literary and artistic works. They have notably participated in the creation of books such as *The Policeman's Beard is Half Constructed*, generated by the program RACTER in 1984, and *Just This Once*, created by the software built by programmer Scott French in 1993.[23]

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[21] STUART RUSSELL & PETER NORVIG, ARTIFICIAL INTELLIGENCE: A MODERN APPROACH 22–24 (3d. ed. 2010).

[22] PHIL KIM, MATLAB DEEP LEARNING: WITH MACHINE LEARNING, NEURAL NETWORKS AND ARTIFICIAL INTELLIGENCE 3 (2017); Stan Franklin, *History, Motivations, and Core Themes*, *in* THE CAMBRIDGE HANDBOOK OF ARTIFICIAL INTELLIGENCE 15 (Keith Frankish & William M. Ramsey eds., 2014); Miller, *supra* note 14, at 1038.

[23] WILLIAM CHAMBERLAIN, INTRODUCTION TO THE POLICEMAN'S BEARD IS HALF CONSTRUCTED: COMPUTER PROSE AND POETRY (1984); Steve Lohr, *The Media Business: Encountering The Digital Age – An Occasional Look at Computers in Everyday Life.; Potboiler Springs From Computer's Loins*, N.Y. TIMES (July 2, 1993), www.nytimes.com/1993/07/02/us/media-business-encountering-digital-age-occasional-look-computers-everday-life.html [https://perma.cc/9QBX-GEBT]; Terry Nasta, *Thief of Arts*, PC MAG., Dec. 24, 1984, at 62 https://books.google.com/books?id=azbgSlPdJawC&lpg=PP1&pg=PA 62 [https://perma.cc/C5XT-KTXF]; Ralph D. Clifford, *Intellectual Property in the Era of the Creative Computer Program: Will the True*

While Scott French's software wrote only a quarter of the novel independently, William Chamberlain, the co-programmer of RACTER, insisted that the book produced by his software "has been proofread for spelling but otherwise is completely unedited."[24]   Similarly, Ray Kurzweil built a system generating poetry, called the "Cybernetic Poet," based on this technology.[25]

The "genius" of both AARON, a robot that can paint in vivid color, and Emmy, an AI music composer that can emulate the style of Mozart, has also been based on expert systems.[26] Developed since the 1970s, AARON's knowledge benefits from the artistic input of his programmer, Harold Cohen, who has continually improved AARON's "talent" by adding new rules to his system.[27] For its part, Emmy was a rule-based program that can produce new pieces inspired by the style of the greatest

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Creator Please Stand Up, 71 TUL. L. REV. 1675, 1692–93 (1997) (discussing the book *Just This Once*).

[24] CHAMBERLAIN, *supra* note 23; Clifford, *supra* note 23, at 1693; Ramalho, *supra* note 18, at 12.

[25] Ray Kurzweil, *Ray Kurzweil's Cybernetic Poet: How it Works,* KURZWEIL CYBERART TECHS., http://www.kurzweilcyberart.com/ poetry/rkcp_how_it_works.php [https://perma.cc/232A-ZJZM] (last visited Mar. 19, 2020).

[26] MARGARET A. BODEN, CREATIVITY AND ART: THREE ROADS TO SURPRISE 142 (2011) [hereinafter BODEN, CREATIVITY AND ART]; Tim Adams, *David Cope: You Pushed the Button and Out Came Hundreds and Thousands of Sonatas*, OBSERVER (July 11, 2010), www.theguard ian.com/technology/2010/jul/11/david-cope-computer-composer [https ://perma.cc/M2BD-EFQJ]; Chris Garcia, *Harold Cohen and AARON— A 40-Year Collaboration*, COMPUT. HIST. MUSEUM (Aug. 23, 2016), www.computerhistory.org/atchm/harold-cohen-and-aaron-a-40-year-co llaboration [https://perma.cc/V245-4E87].

[27] Garcia, *supra* note 26.

composers.[28]   In less than an hour, it could independently produce "5000 original Bach chorales."[29]

2. The 2000s: Neural Networks and Machine Learning

Despite their outstanding contribution to the advancement of artificial intelligence technology, expert systems have obvious limitations, the main one being the difficulty for programmers to manually code all the rules of the system.[30]   At the turn of the century, this constraint was tackled by the development of a new kind of AI system based on neural networks.[31]   Instead of relying purely on symbolic logic, this approach is inspired by the interaction of animal neurons.[32]   Neural AI systems comprise a network of artificial neurons into which information is spread and gradually transformed to produce the desired output. The performance of neural AI systems lies in its number of layers: neurons from a single layer can only achieve simple tasks, but jointly with neurons from subsequent layers, they can accomplish excessively more complex tasks.[33]   In accumulating the completion of simple tasks, the layers are able to solve difficult problems.[34]

The great advantage of multilayer neural networks, also known as "deep learning systems," is their ability to

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[28]   Frida Garza, *The Quest to Teach AI to Write Pop Songs*, GIZMODO (Apr. 19, 2018), gizmodo.com/the-quest-to-teach-ai-to-write-pop-songs -1824157220 [https://perma.cc/3XFN-DDRS].

[29]   Adams, *supra* note 26.

[30]   ETHEM ALPAYDIN, MACHINE LEARNING: THE NEW AI 50 (2016).

[31]   RUSSELL & NORVIG, *supra* note 21, at 29.

[32]   Franklin, *supra* note 22.

[33]   ARLINDO OLIVEIRA, THE DIGITAL MIND: HOW SCIENCE IS REDEFINING HUMANITY 107 (2017).

[34]   *Id.*

learn by themselves.[35] Unlike expert systems, the programmer doesn't have to carefully determine the parameters of the program.[36] A neural system learns how to perform a task by being trained with external data.[37] The more it processes information, the more it refines its algorithm.[38] In 2016, a team of engineers used this method to create an AI system that can generate works in the artistic style of Rembrandt.[39] Their AI system has processed original works from the famous painter to "learn" from the Dutch master himself.[40] By identifying patterns in his masterpieces, it has produced an algorithm enabling the perfect emulation of Rembrandt's technique.[41] This process is commonly known as machine learning.[42] By analyzing Rembrandt paintings, the AI system ("the machine") at the source of "The Next Rembrandt" had defined ("learned") by itself general rules on their visual aspects such as the light, shade, colors, and composition. This technique is particularly useful when programmers seek an output (such as the making of a new Rembrandt) but don't know how to arrange the data into logical rules

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[35] ALPAYDIN, *supra* note 30, at 107; BODEN, AI, *supra* note 19, at 88–89; KIM, *supra* note 22, at 53; M.I. Jordan & T.M. Mitchell, *Machine Learning: Trends, Perspectives, and Prospects*, SCIENCE MAG., July 17, 2015, at 255.

[36] ALPAYDIN, *supra* note 30, at ix, 50.

[37] NICK BOSTROM, SUPERINTELLIGENCE: PATHS, DANGERS, STRATEGIES 9 (2014); Jordan & Mitchell, *supra* note 35.

[38] BODEN, AI, *supra* note 19, at 79.

[39] Erin Blakemore, *'New' Rembrandt Created, 347 Years After the Dutch Master's Death*, SMITHSONIAN MAG., Apr. 5, 2016, https://www .smithsonianmag.com/smart-news/new-rembrandt-created-347-years-af ter-the-dutch-masters-death-180958664 [https://perma.cc/8DP9-CUM B]; Chris Baraniuk, *Computer paints 'new Rembrandt' after old works analysis*, BBC NEWS (Apr. 6, 2016), www.bbc.com/news/technology-35977315 [https://perma.cc/5TA3-D73K].

[40] Blakemore, *supra* note 39; Baranjuk, *supra* note 39.

[41] Blakemore, *supra* note 39; Baranjuk, *supra* note 39.

[42] KIM, *supra* note 22, at 2; OLIVEIRA, *supra* note 33, at 97.

(which, in the case of "The Next Rembrandt," would be the algorithmic translation of the aspects of paintings).[43]

Besides "The Next Rembrandt" project, the use of such systems has led to the conception of many literary and artistic works of quality. Amper Music, Jukedeck, and Google Magenta are all music generators based on such technology.[44] Many visual artwork have also been produced by neural systems. Tom White has built an AI system that can generate, after having analyzed thousands of images, an "abstract visual representation" of common objects, such as a basketball.[45] Robbie Barrat has conceived an AI system that produces surrealist shapes representing deformed naked bodies.[46] Likewise, the e-David robot can convincingly paint portraits and landscapes in many different styles.[47]

Some AI systems were also trained to produce literary pieces. For example, the software engineer Zack Thoutt built a neural network which generated five chapters of the "next" Game of Thrones novel based on the previous books. The story is very credible, but the writing style is far from perfect.[48] The prose of Wordsmith, an "automated

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[43] ALPAYDIN, *supra* note 30, at 16.

[44] Dredge, *supra* note 2; Cherie Hu, *How Music Generated by Artificial Intelligence is Reshaping - Not Destroying - the Industry*, BILLBOARD (Apr. 19, 2018), www.billboard.com/articles/business/8333911/artificia l-intelligence-music-reshaping-destroying-industry [https://perma.cc/B SM2-U4D7].

[45] Tom White, *Perception Engines*, MEDIUM (Apr. 4, 2018), https:// www.medium.com/artists-and-machine-intelligence/perception-engines -8a46bc598d57 [https://perma.cc/ML58-AEJN].

[46] Sidney Fussell, *AI Imagines Nude Paintings as Terrifying Pools of Melting Flesh*, GIZMODO (Mar. 30, 2018), https://www.gizmodo. com/ai-imagines-nude-paintings-as-terrifying-pools-of-melti-18241931 90 [https://perma.cc/NSZ3-LFTL].

[47] E-DAVID, *supra* note 3.

[48] Hill, *supra* note 1.

sports journalist" that reports on college sports and Minor
League Baseball for the Associated Press, is much more
convincing, though its software is based on the expert
system technology.[49] It proves that, to this day and despite
their limitations, some rules-based software such as
Wordsmith (but also Emmy and AARON) can accomplish
their tasks in a better (or at least comparable) way than
many neural network systems. Nonetheless, with the recent
breakthrough in AI systems technology, it is predictable
that, in the years to come, the quality of computer-
generated works will continue to improve.

B.   *The Nature of Works Produced with Computers*

In past decades, computers have been mainly
considered tools used by humans to achieve their literary or
artistic endeavors. In most cases, human artists participated
directly in the creation of such works, similar to painters
with canvas and brushes. Nevertheless, as shown in this
Article, computers can now produce impressive artwork
and literary pieces with minimal, and perhaps even absent,

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[49] Ian Crouch, *The Sportwriting Machine*, NEW YORKER (Mar. 26,
2015), https://www.newyorker.com/sports/sporting-scene/the-sportswri
ting-machine [https://perma.cc/9J4R-E3QS]; *AP Expands Minor
League Baseball Coverage*, ASSOCIATED PRESS (June 30, 2016),
https://www.ap.org/press-releases/2016/ap-expands-minor-league-base
ball-coverage [https://perma.cc/PMY7-VSCK]; Laura Pressman, *The
State of Artificial Intelligence in 2017*, AUTOMATED INSIGHTS (June 14,
2017), https://automatedinsights.com/blog/the-state-of-artificial-intellig
ence [https://perma.cc/3JE4-CKEU] ("Automated Insights' product,
Wordsmith, is another example of rules-based AI-it provides an
interface for creating rules that determine what words, phrases, or
sentences appear in output narratives given conditions in a dataset.");
Laura Pressman, *Take Me Out to the Ball Game: Ai & AP Automate
Baseball Journalism at Scale*, AUTOMATED INSIGHTS (July 17, 2016),
https://automatedinsights.com/blog/take-automated-ball-game-next-cha
pter-ai-ap-partnership [https://perma.cc/HY8J-X2GJ].

human creative intervention. Having defined expert systems and neural networks, I will now examine the nature of works produced by them. Although some AI systems, namely the expert systems, require an important contribution by the programmers, the new neural networks do not need to be fully coded by humans. Despite this difference, they both appear as independent producers of content rather than mere tools for human creation. To determine the nature of such works, I will divide computer works into two categories: the ones created by humans in collaboration with computers and the ones generated by an AI system. These categories are not homogenous, and more nuances will be made.

Works created in collaboration with computers are the most common ones. People use computers to assist them in the creation of their works in their everyday lives. Writers take advantage of word processors to review their texts. Film directors edit and add some effects to their video footage with computers. Visual artists enhance their photographs with image-processing software. In all these cases, computers are mere assistants. The degree of the contribution of human artists may vary, but the humans still have total control over their creations. It is obvious that artists using drawing software, such as Adobe Illustrator, are authors of the works they create in cooperation with the computer. They draw the lines, make the color choices, and select pens in the array offered by the software.[50] The same logic applies to the users of word processors and editing software. When the creative process is dominated by humans, computers are simply another means for artists

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[50] James Grimmelmann, *There's No Such Thing as a Computer-Authored Work—And It's a Good Thing, Too*, 39 COLUM. J.L. & ARTS 403, 407–09 (2016).

to express themselves, so they remain the authors of their works.[51]

Conversely, human authorial contribution to works generated by an AI system is almost absent, or at least imperceptible. It is arguable that an artist who tasks an AI system to create a jazz instrumental song that includes a precise, short melody is an "author." Computers cannot be considered mere tools when the user's role is limited to the selection of a few constraints.[52] In "The Next Rembrandt" project, engineers may have chosen some features, such as the age and the style of clothes of the protagonist, but they are not involved in major authorial decisions. In these cases, the AI system is the "real artist." [53] One may argue that humans behind the conception of AI systems contribute to the originality of the works, but they do not have control over the "expressive" aspects of the generated works.

In the case of expert systems, programmers may have coded all of the rules in the knowledge base. Nonetheless, as asserted by Harold Cohen, the father of the robot painter AARON, expert systems' works are not limited to programmers' abilities.[54] Even if the complete code is written by the programmer-artist, such systems can generate works that are beyond their programmer's creative expectations. This view is shared by Boden. She underlines that rule-based expert systems lead to the

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[51] *See* CAMERON HUTCHISON, DIGITAL COPYRIGHT LAW 54 (2016); BODEN, CREATIVITY AND ART, *supra* note 26, at 137 ("We call this [Computer-Assisted Art], wherein *(df.) the computer is used as an aid (in principle, non-essential) in the art making process*.") (emphasis in original).

[52] BODEN, AI, *supra* note 19, at 71; Bruce E. Boyden, *Emergent Works*, 39 COLUM. J.L. & ARTS 377, 389 (2016).

[53] BODEN, CREATIVITY AND ART, *supra* note 26, at 141.

[54] Garcia, *supra* note 26.

creation of works that are unpredictable.[55] Such programs usually make associations between rules that are not foreseen by their creators.[56] Although they control every aspect of the system, programmers do not define the final output. This is even more obvious for systems based on neural networks. Programmers clearly have an absent role in the originality of the final works. Great parts of algorithms are built by systems themselves through machine learning. Programmers can hardly explain the complete functioning of such algorithms.[57]

For both kinds of systems, programmers only determine their ultimate function. For instance, they decide whether they want a system that produces paintings or one that can generate poetry, but they do not add any creative input in the works created by their systems once they are built. They are like parents who train their children to be musicians. The method they used to make their sons and daughters prodigies may be deeply creative, but their creativity does not extend to the works of their children.

III.   THE BOUNDARIES OF CANADIAN COPYRIGHT LAW

A.   *The Current Boundaries*

Since there is an absence of human authorial participation in the production process of works generated by AI systems, they currently don't fall within the current boundaries of the Canadian *Copyright Act*. To benefit from copyright protection, a work must be fixed, included in one

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[55] BODEN, CREATIVITY AND ART, *supra* note 26, at 129–30.

[56] BODEN, CREATIVITY AND ART, *supra* note 26, at 130 ("For even when a programmer has written explicit step-by-step code, he or she does not necessarily—or even usually—know the outcome.").

[57] ALPAYDIN, *supra* note 30, at 155; Matthew Hutson, *Has Artificial Intelligence Become Alchemy?*, SCIENCE MAG., May 4, 2018, at 478.

of the categories provided in copyright law, and original.[58] Computer-generated works can fulfill the first two criteria, but they do not satisfy the originality criterion. They can be fixed. A work is fixed if it can be perceived and communicated for a sufficient period of time.[59] "The Next Rembrandt" painting is fixed, as are the songs generated by Jukedeck when downloaded by users.

Moreover, computer-generated works can arguably enter into one of the categories covered by copyright law, comprising notable artistic and literary works.[60] Basically, most writings, musical works, and paintings, to name a few, are encompassed in these categories. The artistic merit is of little significance, but copyright's realm is limited to creative works.[61] Works mainly created for practical purposes are excluded. For example, it has been ruled that text on a measuring chart is not a literary work since it merely provides practical instruction.[62] The same reasoning was also applied to a helmet designed for a science-fiction movie.[63] The helmet may have distinctive features, but it primarily serves a utilitarian function.[64]

However, courts have also found unusual artistic and literary qualities in functional works. In *DRG Inc. v Datafile Ltd.*,[65] the Federal Court of Canada recognized that a filing system composed of alphanumerical colored labels,

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[58] VAVER, *supra* note 10, at 100, 107; Copyright Act, R.S.C. 1985, c C-42, § 5 (Can.).

[59] VAVER, *supra* note 10, at 100, 107; Copyright Act, R.S.C. 1985, c C-42, § 5 (Can.).

[60] Copyright Act, R.S.C. 1985, c C-42, § 2 (Can.).

[61] VAVER, *supra* note 10, at 66.

[62] Hollinrake v. Truswell, [1894] 3 Ch. 420 (UK).

[63] Lucasfilm Ltd. v. Ainsworth, [2011] UKSC 39, [45] (appeal taken from Eng.) (UK).

[64] *Id.*

[65] DRG Inc. v. Datafile Ltd., [1988] 2 F.C. 243, para. 17 (Can.).

such as one used for medical records, may be copyrightable. The labels themselves are not protected, but their graphic design represents an artistic work.[66] The Queen's Bench of Alberta has also recently ruled that raw and processed seismic data, produced by a device analyzing geophysical aspects of soil, constitutes a literary work.[67] These decisions, although from first instance courts, blur the line between creative and utilitarian works, suggesting that these categories are extensible. It suggests that works produced by AI systems can be included in one of these categories as well. Many computer-generated works fit more clearly into literary and artistic categories than labels and raw seismic data do. Melodies composed by software, such as Emmy, may be musical works; books written by RACTER are no less of a literary work than Camus' works; and even a poorly-written "Game of Thrones" book that was produced by an AI system can be considered a literary work.

Nevertheless, even if we consider that computer-generated works are included in one of the categories, they must be original to be protected by copyright law.[68] In Canada, the notion of copyright originality has been defined by the Supreme Court in *CCH Canadian Ltd. v. Law Society of Upper Canada*.[69] In this decision, the judges unanimously reject the "sweat of the brow" approach. They consider that it sets the bar too low.[70] Under this conception of originality, an original work is

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[66] *Id.* at para. 21–22.

[67] Geophysical Service Inc. v. Encana Corp., 2016 ABQB 230, para. 75 (Can. Alta.).

[68] *CCH*, [2004] 1 S.C.R. 339, at para. 16.

[69] *Id.*

[70] *Id.* at para. 15–16.

merely a work that is not copied.[71] An author's labor is
thus sufficient to gain protection. This would allow the
copyrightability of works that are the results of "largely
mechanical processes,"[72] such as compilations (e.g. a phone
directory). On the other hand, the Supreme Court notes
that it would be too high of a standard to require the
minimum amount of creativity that is required for copyright
protection in the United States.[73] It would "impl[y] that
something must be novel or non-obvious — concepts more
properly associated with patent law than copyright law."[74]
McLachlin J., writing for the judges, suggests that "the
correct position falls between these extremes."[75]

Thus, to be original, a work must be the result of the
exercise of skill and judgment by its author.[76]   A
mechanical technique might require a lot of skill, but it is
not sufficient to fulfill the originality criteria. An author
needs to make some choices in the expression of his ideas,
using his "capacity for discernment or ability to form an
opinion or evaluation by comparing different possible
options" in the creation of his work.[77]   According to
Gervais, the Canadian originality "standard [is thus]
essentially identical to [the American standard] . . . [since]
what makes . . . the effort and labor . . . neither mechanical
nor trivial . . . is precisely the presence of a modicum of

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[71] University of London Press, Ltd. v. University Tutorial Press, Ltd.,
[1916] 2 Ch. 601 (UK).
[72] Teresa Scassa, *Original Facts: Skill, Judgment, and the Public
Domain*, 51 MCGILL L.J. 253, 258 (2006).
[73] *CCH*, [2004] 1 S.C.R. 339, at para. 15, 24; *see also Feist*, 499 U.S.
at 362.
[74] *CCH*, [2004] 1 S.C.R. 339, at para. 24.
[75] *Id.* at para. 16.
[76] *Id.*
[77] *Id.*

creativity."[78]   In both cases, it necessitates the presence of an internal authorial intention.   An author must make creative choices, which means "that another [person would not] likely have created the same 'work' in the same context."[79]   For instance, a person must have certain skills to gather information for the production of a phone directory, but listing phone numbers in alphabetical order is a choice that other persons would likely have made. Thus, this work does not meet the originality standard because it lacks "some form of intellectual engagement in the process of creating the work."[80]

In this regard, works created in collaboration with a computer, such as photographs modified with an image-processing software or a novel written with a word processor, are copyrightable, but ones produced without human authorial intervention and with an AI system, such as newspaper articles written by Wordsmith (the automated sports journalist), are not original. One could argue that the AI systems producing these latter works can exercise the required judgment.   After all, such systems are built to make decisions and evaluate options. However, the words used in *CCH* and their context suggests the limitation of original works to human-authored ones.[81]   An AI system that cannot "form an opinion" cannot have a "capacity for discernment."[82]   The rejection of the "sweat of the brow" approach by the Canadian Supreme Court reinforces this interpretation of *CCH*.[83]   Talented humans may participate in the design of AI systems that can produce genuine

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[78] Daniel J. Gervais, *Canadian Copyright Law Post-CCH*, 18 I.P.J. 131, 139 (2005).
[79] *Id.*
[80] Scassa, *supra* note 72, at 259.
[81] Perry & Margoni, *supra* note 8, at 625.
[82] *CCH*, [2004] 1 S.C.R. 339, at para. 16.
[83] Perry & Margoni, *supra* note 8, at 625.

works, but the exercise of skill is not sufficient to satisfy the originality requirement—there must be a minimal human creative input. Hence, computer-generated works are not original and currently fall outside the scope of copyright law.[84]

B. *Extensible Boundaries*

The absence of originality, however, does not preclude the inclusion of computer-generated works. The history of copyright law shows that its boundaries are extensible. Computer-generated works may be, currently, not protected, but copyright law has been extended several times to include works created and distributed using the new inventions of the time.[85] Over the years, the development of new technologies led, notably, to the inclusion of photographs, cinematographic works, sound recordings, and broadcasts within the scope of copyright protection. It is possible to foresee the incorporation of computer-generated works in the near future.

The debate surrounding the copyrightability of computer-generated works may be reminiscent of the debate over the inclusion of photography more than one hundred and fifty years ago. The United Kingdom amended its act to cover photographs as early as 1862, followed by the United States in 1865.[86] It was contested in both jurisdictions.[87] Similar to computer-generated works nowadays, the protection of photography pushed the

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[84] VAVER, *supra* note 10, at 115; Perry & Margoni, *supra* note 8, at 625.

[85] Ong, *supra* note 11, at 255.

[86] Justin Hughes, *The Photographer's Copyright: Photograph as Art, Photograph as Database*, 25 HARV. J.L. & TECH. 339, 352 (2012).

[87] *Id.* at 351–52; Anne McCauley, *'Merely Mechanical': On the Origins of Photographic Copyright in France and Great Britain*, 31 ART HISTORY 57, 69 (2008).

limits of copyright law. In the end, the courts recognized its copyrightability since photographers can express themselves using a camera as a tool.[88] I admit that the analogy with photographs cannot be completely transposed to the situation of computer-generated works. There is an important difference between the rationales for their inclusion in copyright law. Computer-generated works clearly have a lack of authorial intention, but the history of the protection of photographs is interesting and relevant for showing that copyright evolves with society. The treatment of photography has changed following the social acceptance of the medium.[89] As an innovation challenging the creative market, similar questions are also raised by the copyrightability of computer-generated works.

In fact, although no one is responsible for the originality of computer-generated works, it may be reasonable to include them in copyright law, since a person can still be responsible for their production and distribution. In the case of "The Next Rembrandt," a person chose the characteristics of the portrait that he tasked an AI system with generating. Users of Jukedeck select some features of computer-generated songs.

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[88] Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53, 60 (1884) (expanding copyright protection to photographs in the United States); Nottage v. Jackson, [1883] 11 QBD 627, 631–32 (Eng.) (expanding copyright protection to photographs in the United Kingdom); Hughes, *supra* note 86, at 356; Kathy Bowrey, *'The World Daguerreotyped – What a Spectacle!' Copyright Law, Photography and the Commodification Project of Empire*, UNSW L. RES. PAPER No. 2012-18, 18 (2012), https://ssrn.com/abstract=2060803 [https://perma.cc/5V NG-E2E2].

[89] In Canada, before 2012, the copyright was allocated to the owner of the negative of the photograph who was also the deemed author. Since this amendment, photographs fall under the copyright general regime and photographers are considered the authors. Copyright Modernization Act, S.C. 2012, c 20, cl. 7 (Can.); VAVER, *supra* note 10, at 122, 146.

Moreover, to some extent, the Associated Press "employs" Wordsmith for the reporting of sports matches. There is a curating aspect in computer-generated works that might be recognized in copyright law. As I will suggest in Part V, their inclusion may be inspired by the neighboring rights, an alternative regime in the Copyright Act. These rights are not based on traditional originality and authorial criteria.[90] They are allocated to people who are not authors, but arrangers and disseminators.[91] Copyright is usually granted to works with sufficient human originality in their creation, but the purpose of the Copyright Act is flexible enough to be expanded to new kinds of works and protection rights.

IV. A REVIEW OF LITERATURE IN ANGLO-AMERICAN JURISDICTIONS

Before discussing the inclusion of computer-generated works in the Copyright Act, it is relevant to first review the copyright literature on artificial intelligence. It will clarify the scope of the debate and the contribution of this Article. Early literature discussing this topic arose in the 1980s and 1990s in the United States. It was published at a time when computer science was still in its infancy and, although high expectations were put on the development of expert systems, the production of interesting creative works by these systems was still speculative. Most scholars agreed with the inclusion of computer-generated works in copyright law, though some already recognized the absence of authorship in these

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[90] Ong, *supra* note 11, at 255 ("Thus copyright has extended its reach beyond the realm of 'authorial' works . . . to encompass the products of 'entrepreneurial' investment as well, including sound recordings, cinematographic films, broadcasts and published editions of printed materials.").

[91] VAVER, *supra* note 10, at 63, 109–10.

works.[92] With the decline of expert systems, this series of articles ended in the early 1990s. The revival of this scholarship emerged from a variety of countries a decade later, likely encouraged by the promises of neural networks. Several scholars continued to argue for the inclusion of computer-generated works, but the debate became more contentious. In the light of the recent landmark decisions on the human aspect of originality, many questioned the nature of such works and remained skeptical of their copyrightability.[93] I will mainly focus on Anglo-American jurisdictions since they share similar roots with Canada's copyright tradition.[94]

A.   1980s-1990s: The Early Literature in the United States

At the beginning of the 1980s, copyright scholarship on the protection of works produced with computers mostly came from the United States, which might have been triggered by the work of the National Commission on New Technological Uses of Copyrighted Works (CONTU).[95]   From 1974 to 1978, CONTU

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[92] *See* Butler, *supra* note 14, at 747; Miller, *supra* note 14, at 1066–67; Samuelson, *supra* note 14, at 1192. *But see* Farr, *supra* note 14, at 80 (concluding that authorship should be vested in the programmer of the underlying computer program).

[93] *See Feist Publ'ns*, 499 U.S. at 363–64 (discussing the originality requirement in the U.S.); IceTV Pty. [2009] HCA 14 (Austl.) (discussing the originality requirement in Australia); Telstra Corp. Ltd., [2010] FCAFC 149 (Austl.) (discussing the originality requirement in Australia); Telstra Corp. Ltd., [2010] FCA 44, ¶ 300–44 (Austl.) (discussing the originality requirement in Australia); *CCH,* [2004] 1 S.C.R. 339, at para. 16 (discussing the originality requirement in Canada).

[94] Tawfik, *supra* note 9, at 35.

[95] Gerardo Con Díaz, *The Text in the Machine: American Copyright Law and the Many Natures of Software, 1974-1978*, 57 TECH. CULT. 753, 753–54 (2016).

commissioners reviewed the computing industry to determine whether computer programs and computer-related works should be included in the scope of copyright.[96] In their final report, they concluded that the computer itself does not participate in the creative process. A "computer, like a camera or typewriter, is an inert instrument, capable of functioning only when activated either directly or indirectly by a human."[97]

Timothy L. Butler, in one of the first articles on the protection of computer-generated works, published only a few years after the report, however, argued that CONTU commissioners "did not adequately address the looming onslaught of AI-based products and creations."[98] He considered that these works have "no human 'author' within the bounds of common usage of the term,"[99] though he further advocated for their inclusion in copyright law. He claimed that it would be inconsistent with copyright law's past amendments to not protect computer-generated works; copyright's scope has been constantly widened following technological progress.[100] Thus, we should include a legal fiction in the copyright law that would consider works produced by computers as human-authored.[101] Rights should be distributed between the user of the computer, the owner of the program, and the programmer.[102] Moreover, Butler mentioned that this measure, in ensuring investors a "legal security," would both encourage the development of new AI systems and,

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[96] *CONTU Final Report*, *supra* note 15, at 1; Miller, *supra* note 14, at 1068.
[97] *CONTU Final Report*, *supra* note 15, at 44.
[98] Butler, *supra* note 14, at 747.
[99] Butler, *supra* note 14, at 733.
[100] Butler, *supra* note 14, at 735.
[101] Butler, *supra* note 14, at 744, 746.
[102] Butler, *supra* note 14, at 744, 746.

more convincingly, the dissemination of computer-generated works in accordance with copyright social policy.[103]   This latter claim is particularly interesting.   It raises the economic role of copyright law and thus suggests the importance of promoting the distribution of expressive content.

In her 1985 article, Pamela Samuelson came to a slightly different conclusion.[104] She opined that only users of AI systems should own the copyright of works produced by machines.[105]   Since users are in the best position to appreciate the quality of the works and make some modifications to them, they should have the power to commercially exploit them.[106]   As she noted, such a measure would be comparable to the work made for hire provision which provides employers with the copyright on works made by their employees in the course of their employment.[107]   In a comparable way to users of AI systems, employers do not participate in the creative process, but they are at the origin of their production. In an economic perspective like Butler, she recognized that users might not need to be incentivized to click on a button to generate a work, but that allocating them copyright may encourage them to put such works into circulation which could be beneficial to society.[108]

Nevertheless, as argued by Arthur Miller, deciding on the extent of protection for computer-generated works in

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[103] Butler, *supra* note 14, at 735.

[104] Samuelson, *supra* note 14.

[105] Samuelson, *supra* note 14, at 1192.

[106] Samuelson, *supra* note 14, at 1192, 1203.

[107] Copyright Act of 1976, 17 U.S.C. §§ 101, 201(b), 203(a) (2012); Samuelson, *supra* note 14, at 120. The work made for hire doctrine is found in U.S. copyright law, but a similar approach is also included in Canadian copyright law.

[108] Samuelson, *supra* note 14, at 1226.

the 1980s was very speculative.[109] According to Miller, there were no computer-generated works. Since the functions of "expert systems" were limited to the rules dictated by programmers and users, it was possible to identify a human author.[110] Therefore, granting rights on these works to the programmers and users was not departing much from the human authorship requirement in the copyright law because they participate in their creation.[111] However, his vision of 1980s expert systems is contestable. As recognized by Butler and Samuelson, there is hardly any authorial contribution in a work when no one can predict its "expressive" features.[112] Expert systems were manually programmed, but works they generated were not predicted by the programmer nor by the user.[113]

On the other hand, Miller's position may simply reflect a reality of this era: it was difficult to detach human contribution from computers' output.[114] Even for scholars who acknowledged the lack of "authorship" in the creation of computer-generated works thirty years ago, the production of enjoyable works by computers without any subsequent human creative modifications was hard to imagine. In her article, Samuelson qualified computer-

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[109] Miller, *supra* note 14, at 1038.

[110] Miller, *supra* note 14, at 1049.

[111] Miller, *supra* note 14, at 1066; *see also* Farr, *supra* note 14, at 80.

[112] Butler, *supra* note 14, at 733 ("[T]he program supplies the specific words, plot, characters and apparent 'expression' of an idea. The story has no human 'author' within the bounds of common usage of the term and, within the meaning of the Act, is possibly not copyrightable material under present law."); Samuelson, *supra* note 14, at 1226 ("If a flawless work has been created by use of a computer program, and the law deems the work incapable of being owned because of the lack of a human author").

[113] Boden, CREATIVITY AND ART, *supra* note 26, at 129–30; Garcia, *supra* note 26; *see also supra* Section II.B.2.

[114] Miller, *supra* note 14, at 1053.

generated works several times as "raw output" to be modified by human authors (like the book "*Just This Once*" produced by software and then co-written by its user).[115] Although she mentioned the possibility of the production of "flawless works" by AI systems, it seems more like a hypothetical perspective to support her point.[116] Hence, these first articles may not fully represent AI systems as we conceive of them today. The understanding of computing and artificial intelligence technologies has evolved greatly since then.[117] However, Butler and Samuelson have raised an interesting economic insight for the protection of computer-generated works—namely, the encouragement of the dissemination of expressive works—and paved the way for the rebirth of the scholarship some years later.[118]

B. The 2000s: A Revival in Computer-Generated Works Literature

At the dawn of the twenty-first century, probably stimulated by the progress in artificial neural networks and the possible arrival on the market of AI systems, scholars became interested again in copyright issues related to

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[115] *See* Samuelson, *supra* note 14, at 1201, 1203–04, 1224–26 (discussing the "raw output" of AI systems).

[116] *See* Samuelson, *supra* note 14, at 1226. This is the only time she mentions the possibility of a "flawless work" and she uses "if," a conditional clause.

[117] *See, e.g.*, Colin R. Davies, *An Evolutionary Step in Intellectual Property Rights: Artificial Intelligence and Intellectual Property*, 27 COMPUT. L. & SEC. REP. 601, 610 (2011) ("[C]onsidering the enormous developments in AI technology since 1985[,] . . . while this deals with the situations envisaged at the time, as we shall see later the current generation of AI programs are capable of producing works without the input of a 'human['] user and bearing no relationship at all to the original program so we are still left with a lacuna in authorship of such AI generated works.").

[118] *See* Butler, *supra* note 14, at 735; Samuelson, *supra* note 14, at 1226.

computer-generated works.[119]   While many still advocate for the inclusion of computer-generated works in the realm of copyright law, some express concerns on the relevance of such an extension.[120]   This growing dissension may be explained by the confirmation by higher courts, after the publication of the early articles, of the human authorship requirement in the analysis of originality.[121]   Furthermore, with the technological improvements and the changes in the digital culture, the absence of human expression in works produced by AI systems became more obvious.   This new reality forces defenders of computer-generated works' copyrightability to support more comprehensively their position under the copyright rationale, which they might not have convincingly accomplished yet.

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[119] Annemarie Bridy, *Coding Creativity: Copyright and the Artificially Intelligent Author*, 2012 STAN. TECH. L. REV. 5 (2012) [hereinafter Bridy, *Coding Creativity*]; Davies, *supra* note 117; Robert C. Denicola, *Ex Machina: Copyright Protection for Computer-Generated Works*, 69 RUTGERS U. L. REV. 251 (2016); Guadamuz, *supra* note 17; Kalin Hristov, *Artificial Intelligence and the Copyright Dilemma*, 57 IDEA 431 (2017); McCutcheon, *supra* note 17; Shlomit Yanisky-Ravid, *Generating Rembrandt: Artificial Intelligence, Accountability and Copyright - The Human-Like Workers Are Already Here - A New Model*, 2017 MICH. ST. L. REV. 659 (2017); Andrew J. Wu, *From Video Games to Artificial Intelligence: Assigning Copyright Ownership to Works Generated by Increasingly Sophisticated Computer Programs*, 25 AIPLA Q. J. 131 (1997) (these scholars advocate for the inclusion of computer-generated works into copyright law).

[120] *See* Boyden, *supra* note 52, at 379; Clifford, *supra* note 23, at 1701–02; Grimmelmann, *supra* note 50; Perry & Margoni, *supra* note 8; Ramalho, *supra* note 18 (these scholars are skeptical about the inclusion of computer-generated works in copyright law).

[121] *See CCH* [2004] 1 S.C.R. 339, at para. 14 (discussing the originality requirement in Canada); *Feist Publ'ns*, 499 U.S. 340; IceTV Pty. [2009] HCA 14; Telstra Corp. Ltd. [2010] FCA 44; Telstra Corp. Ltd. [2010] FCAFC 149.

1. Advocating the Protection of Computer-Generated Works

The arguments of scholars who advocate for the copyright protection of computer-generated works can generally be summarized in two points. First, they maintain that copyright originality should not be limited to human authorship.[122] According to some of them, if computer-generated works look as original as human-authored ones, they should be protected. Secondly, rights on those works should be attributed to a deemed author such as the user or the programmer.[123]

a. Originality and Human Authorship

Human authorship is still a central requirement for a work to be considered original under copyright law, but scholars, such as Bridy and McCutcheon, consider that the presence of a human author should not be essential to gain copyright protection.[124] AI systems are now able to generate astonishing creative works that would certainly be copyrightable if they were produced by humans. This question was not that central in the American articles of the 1980s and early 1990s. Most of them predate *Feist*, the 1991 landmark decision confirming the human aspect of

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[122] *See* Bridy, *The Evolution of Authorship*, *supra* note 17, at 399; Anne Fitzgerald & Tim Seidenspinner, *Copyright and Computer-Generated Materials–Is it Time to Reboot the Discussion About Authorship?* 3 VICTORIA U. L. & JUST. J. 47, 63–64 (2013); McCutcheon, *supra* note 17, at 954.

[123] Bridy, *Coding Creativity*, *supra* note 119, at ¶ 63; Davies, *supra* note 117, at 612, 618; Denicola, *supra* note 119, at 286–87; Guadamuz, *supra* note 17, at 186; Kalin Hristov, *supra* note 119; McCutcheon, *supra* note 17, at 960; Yanisky-Ravid, *supra* note 119, at 712; Wu, *supra* note 119, at 159.

[124] Bridy, *Coding Creativity*, *supra* note 119, ¶ 49; McCutcheon, *supra* note 17, at 954.

originality in the United States.[125] Similar decisions were later taken by Canadian and Australian higher courts.[126] As mentioned in Part III, in *CCH*, the Supreme Court of Canada determined that, though a mechanical reproduction might require a lot of skill, the author has to include in his work a minimal amount of intellectual effort to gain copyright protection.[127] This intellectual effort can only be achieved by humans. A review of the nature of computer-generated works showed that neither programmers nor users include a sufficient amount of their personal expression in the resulting works.[128]

Therefore, many argue that copyright law should depart from this conception of authorship. Bridy points out that it does not reflect the actual collective creative process since few authors enshrine their genius and personality in their artistic and literary works.[129] Rather, she suggests that human creativity is algorithmic.[130] Like computers, humans would not be able to create without rules and constraints.[131] It is only when using the knowledge, codes, and rules cultivated by humanity over the centuries that

[125] *Feist Publ'ns.*, 499 U.S. 340; 1 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT §§ 1.06, 2.01[B] (Matthew Bender ed., 2017).

[126] In Australia, a string of cases established that, since the originality criterion requires an intellectual effort, only human authorship can produce original works and thus excluded computer-generated works from the application of this criterion. *See* IceTV Pty. [2009] HCA 14, at ¶¶ 33, 47–48; Telstra Corp. Ltd. [2010] FCAFC 149, at ¶¶ 3, 8; Telstra Corp. Ltd. [2010] FCA 44, at ¶¶ 5, 20. The Supreme Court of Canada affirmed that an intellectual effort is required to fulfill the originality criterion. *CCH*, [2004] 1 S.C.R. 339, at para. 16.

[127] CCH, [2004] 1 S.C.R. 339, at para. 16; VAVER, *supra* note 10, at 100.

[128] *See supra* Section II.B.2.

[129] Bridy, *Coding Creativity*, *supra* note 119, ¶ 7.

[130] Bridy, *Coding Creativity*, *supra* note 119, ¶ 27.

[131] Bridy, *Coding Creativity*, *supra* note 119, ¶ 27.

authors can express their ideas.[132] In this sense, there is a lot in common between computer-generated works and human-authored ones. Moreover, McCutcheon underlines that the requirement for human intellectual contribution is so low that computer-generated works can easily be considered originals.[133] A lot of works created by humans are protected even if they don't really encompass the personal expression of their authors.[134] In this vein, Yanisky-Ravid and Velez argue that the originality of literary and artistic works should be evaluated by their extrinsic qualities rather than the creative process at the origin of their production.[135] The criterion for originality should be, more objectively, based on the perception of the audience rather than the motivations of the author which are almost impossible to identify.[136] Therefore, once computer-generated works' external features are qualified as original works, they should be included in the scope of copyright law.[137]

b. *The Fictionalization of the Author: A Framework of Protection*

The principal framework suggested by these scholars for the inclusion of computer-generated works in copyright law remains the fictionalization of the author, as

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[132] Bridy, *Coding Creativity*, *supra* note 119, ¶ 27.

[133] McCutcheon, *supra* note 17, at 954; *see also* Darin Glasser, *Copyright in Computer-Generated Works: Whom, If Anyone, Do We Reward?* 2001 DUKE L. & TECH. REV. 0024, ¶ 44 (2001).

[134] McCutcheon, *supra* note 17, at 954 ("Copyright works can still be created without much, if any, mental exertion.").

[135] Shlomit Yanisky-Ravid & Luis Antonio Velez-Hernandez, *Copyrightability of Artworks Produced by Creative Robots and Originality: The Formality-Objective Model*, 19 MINN. J.L. SCI. & TECH. 1, 40 (2018).

[136] *Id.* at 33.

[137] *Id.* at 40, 49.

Butler suggested in the early 1980s.[138] Some, such as Wu and Davies, propose recognizing AI systems as the "fictional authors" and then assigning their rights to humans.[139] It would acknowledge the fact that works are created by a computer, but also allow a deserving person to own and manage rights in them.[140] However, most scholars, including Denicola, agree that the person arranging the production of these works should be both the "fictional author" and the owner of the rights.[141]

The popularity of this latter suggestion may be explained by the adoption of a similar provision by many jurisdictions including the United Kingdom.[142] Under § 9(3) of the *United Kingdom Copyright, Designs and Patents Act*, the author of a computer-generated work is "the person by whom the arrangements necessary for the creation of the work are undertaken."[143] Therefore, depending on the context, the programmer or the user will be the owner of such work, without having to include any personal input in it.[144] Nonetheless, it is relevant to note that the § 9(3) adopted in 1988 was based on the 1977 Whitford Committee report, which, like the CONTU report in the United States, concluded that computers are only mere tools assisting humans in their creative endeavors.[145]

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[138] Butler, *supra* note 14, at 744, 746; Denicola, *supra* note 119, at 286–87; Wu, *supra* note 119, at 159.

[139] Davies, *supra* note 117, at 612, 618; Wu, *supra* note 119, at 159.

[140] Davies, *supra* note 117, at 612, 618; Wu, *supra* note 119, at 159.

[141] Denicola, *supra* note 119, at 286–87.

[142] Copyright, Designs and Patents Act 1988, c. 48, § 9(3) (UK) [hereinafter U.K. Copyright Act]; Guadamuz, *supra* note 17, at 175 ("Besides the U.K., such protection exists only in Ireland, New Zealand, India, and Hong Kong.").

[143] U.K. Copyright Act, *supra* note 142, at c. 48, § 9(3).

[144] Guadamuz, *supra* note 17, at 177.

[145] COMMITTEE TO CONSIDER THE LAW ON COPYRIGHT AND DESIGNS, COPYRIGHT AND DESIGNS LAW: REPORT OF THE COMMITTEE TO

Hence, misled by this vision of the nascent artificial intelligence programs, the U.K. legislator might not intend to enlarge copyright law to include all computer-generated works as we define them today. At the time of the adoption of this act, humans were still considered active creative contributors in the production of such works.

Regardless of the origin of this provision, for Guadamuz and many others, it would be desirable and not a significant change to follow the U.K. approach in other Anglo-American jurisdictions.[146] The threshold of originality is low, and the works created by AI systems may be equivalently "original" to human-authored ones. In the spirit of the U.K. provision, scholars such as Bridy, Hristov, McCutcheon, and Yanisky-Ravid advocate for the adoption of a provision inspired by the work made for hire doctrine.[147] Following this doctrine included in the *U.S. Copyright Act*, corporations are deemed the authors of the works created by their employees as part of their employment.[148]

The owner of these works would be the person who makes the arrangement to produce computer-generated works.[149] For example, it can be the company that developed the AI system or financed the development of

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CONSIDER THE LAW ON COPYRIGHT AND DESIGNS, 1977, at 132–33 (UK) [hereinafter Whitford Report]; Davies, *supra* note 117, at 601, 610–11.

[146] Guadamuz, *supra* note 17, at 186.

[147] Bridy, *Coding Creativity*, *supra* note 119, ¶ 63; Hristov, *supra* note 119, at 442; McCutcheon, *supra* note 17, at 960; Samuelson, *supra* note 14, at 1203 (it is interesting to note that Samuelson mentions the possibility to adopt a "work made for hire" rule for computer-generated works in 1985); Yanisky-Ravid, *supra* note 119, at 713.

[148] 17 U.S.C. §§ 101, 201(b), 203(a); NIMMER, *supra* note 125, at § 1.06[C].

[149] Guadamuz, *supra* note 17, at 185.

such a project or the users of such systems. The protection would last for a fixed period of time from their publication or creation.[150] Moreover, it would be in accordance with copyright law because, though works are produced by a computer, the authorship will be granted to a legal person.[151] As noted by Hristov, it can be as simple as extending the definition of employee to AI systems.[152] Although this proposition was made by considering the United States copyright framework, it can be equally applied to the Canadian copyright law since it contains a similar provision for "work[s] made in the course of employment."[153]

2. A More Skeptical Perspective

On the other side of the spectrum, some scholars remain doubtful about the protection of computer-generated works.[154] Although not fiercely against their inclusion in copyright law, they have concerns about the granting of rights in creative works produced by mechanical algorithms. It appears to them that extending copyright law would contradict the human aspect of authorship and can have, more generally, adverse effects on the copyright law regime.

For scholars such as Ramalho, Clifford, and Boyden, human contribution is an essential element for copyright protection.[155] In support of her claim, Ramalho

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[150] 17 U.S.C. § 302(c).
[151] Hristov, *supra* note 119, at 449; Yanisky-Ravid, *supra* note 119, at 719.
[152] Hristov, *supra* note 119, at 447.
[153] Copyright Act, R.S.C. 1985, c C-42, § 13(3) (Can.).
[154] Ramalho, *supra* note 18, at 14, 21; Boyden, *supra* note 52, at 394; Clifford, *supra* note 23, at 1681, 1695; Grimmelmann, *supra* note 50, at 415; Perry & Margoni, *supra* note 8, at 628.
[155] Ramalho, *supra* note 18, at 14, 21; Boyden, *supra* note 52, at 394; Clifford, *supra* note 23, at 1681, 1695.

relies on the definition of authorship provided by Jane Ginsburg in her 2003 seminal article. After having analyzed copyright laws of different jurisdictions, Ginsburg construed the author as "a human being who exercises subjective judgment in composing the work and who controls its execution."[156] Although she herself recognizes that it is not an exhaustive definition, she insists that it shows the centrality of human authorship in copyright and the subjectivity of creativity.[157] Similarly, Clifford agrees that human participation in the creation of works is crucial for copyright protection since only humans can be positively affected by such provisions.[158] Hence, it will not be beneficial for society to restrict the use of computers' output.[159]

For his part, Boyden claims that authorship specifically requires the presence of a "meaning or message . . . embodied in [the] work" and that solely human creators can include it.[160] Copyright on computer-generated works can only be granted to the person who has communicated a message in such works.[161] Therefore, if no one can predict the nature of AI systems' works, they should not be protected.[162] The audience may find the works expressive and interesting, but, as Boyden suggests, no person deserves rights in such works.[163] Neither the programmer nor the user participates in the creative process.[164]

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[156] Ramalho, *supra* note 18, at 14; Jane C. Ginsburg, *The Concept of Authorship in Comparative Copyright Law*, 52 DePaul L. Rev. 1063, 1066 (2003) [hereinafter Ginsburg, *The Concept of Authorship*].
[157] Ginsburg, *The Concept of Authorship*, *supra* note 156, at 1066.
[158] Clifford, *supra* note 23, at 1701–02.
[159] Clifford, *supra* note 23, at 1701–02.
[160] Boyden, *supra* note 52, at 385.
[161] Boyden, *supra* note 52, at 394.
[162] Boyden, *supra* note 52, at 389.
[163] Boyden, *supra* note 52, at 393.
[164] Boyden, *supra* note 52, at 389.

Notwithstanding this conclusion, Perry and Margoni contend that it would be simply too speculative to decide whether to allocate rights to the user or the programmer since both have made an insignificant contribution.[165]

However, in spite of her assertion about the human nature of authorship, Ramalho still suggests that, in some circumstances, exclusive rights in computer-generated works may be justified to encourage a person to publish and disseminate the works.[166] It relates to Butler and Samuelson's position on incentivizing the circulation of works.[167] Ramalho notes that the adoption of a limited right for disseminators of computer-generated works might be desirable.[168] It is not because such works are authorless that they should necessarily fall in the public domain.[169] Nonetheless, as warned by Grimmelmann, the adoption of new provisions to extend copyright protection to computer-generated works may lead to unwanted consequences.[170] It might be preferable not to modify the current framework. Copyright law already covers most of the situations involving the production of works with computers. We do not need a specific rule for the ones produced by AI systems. Beyond the novelty of computer-generated

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[165] Grimmelmann, *supra* note 50, at 414; Perry & Margoni, *supra* note 8, at 627.

[166] Ramalho, *supra* note 18, at 22 ("It is however possible that someone who disseminates AIs creations (thus bringing them to the public) needs to be incentivized or rewarded for doing so . . . . A 'disseminator's right' . . . could be a solution.").

[167] *See* Samuelson, *supra* note 14, at 1226; Butler, *supra* note 14, at 735.

[168] Ramalho, *supra* note 18, at 22.

[169] Ramalho, *supra* note 18, at 21–22.

[170] Grimmelmann, *supra* note 50, at 415.

works, there may be a good reason to explain this omission.[171]

   In fact, there is a possibility that a too-extensive provision could cause undesirable outcomes, while a too-narrow one may have little effect. In the former scenario, copyright protection may be allocated to all works produced by an AI system, including the ones automatically stocked in a database following its creation.[172] It would not be logical for owners or users of such systems to gain exclusive rights in these stocked works without participating in their creation or at least participating in their selection.[173] It can thus be very risky to unduly enlarge copyright law when establishing a framework for computer-generated works.[174] The legislator must, prior to any changes, thoroughly determine whether additional protection for computer-generated works would really be beneficial for society and, more importantly, achieve the objectives of copyright law.[175]

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[171] Grimmelmann, *supra* note 50, at 415 ("Because computer-generated works are not different in kind than other works, special-purpose doctrine have little to offer. Indeed, they can make things much worse; the danger of claiming that there is 'a' rule for computer-generated works is that it blinds us to the immense diversity that category encompasses.").

[172] Jesus Manuel Niebla Zatarain, *The Role of Automated Technology in the Creation of Copyright Works: The Challenges of Artificial Intelligence*, 31 INT'L REV. L. COMP. & TECH. 91, 92 (2017); *see also* Michael Marcovici, *Quentis*, ART MARCOVICI, www.artmarcovici.com/ qentis [https://perma.cc/V9AQ-4KWX] (last visited Nov. 15, 2018) (discussing this possibility in one of his artworks).

[173] Zatarain, *supra* note 172, at 92.

[174] Zatarain, *supra* note 172, at 102.

[175] Jane C. Ginsburg, *People Not Machines: Authorship and What It Means in the Berne Convention*, 49 INT'L R. INTELL. PROP. & COMPETITION L. 131, 134 (2018) [hereinafter Ginsburg, *People Not Machines*].

C.   *Toward an Economic Policy Justification*

In a few words, skeptical scholars do not see any sufficient justification for extending copyright protection to computer-generated works. Conversely, scholars advocating for copyright protection of computer-generated works argue that originality should not be exclusive to human creativity.[176] In fact, they argue that it may be more relevant to acknowledge the extrinsic features of expressive works rather than the internal intention of authors when considering originality.[177] Advocates of the protection of AI works may also have proposed great solutions to include computer-generated works in the scope of copyright law. They ground their argument on analogies to other provisions, mainly the work made for hire doctrine.[178] However, the apparent originality of computer-generated works does not mean that they should be included in the scope of copyright law. Computer-generated works can perfectly fit into a theory of copyright originality, but their protection must be justified by the objectives of the law. Not all "original" works are protected. There are public policy reasons supporting that masterpieces of long-dead authors, such as Shakespeare and Molière, are not protected.

The literature review reveals that, although proponents of the protection of computer-generated works only explored very briefly the policy justifications for their

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[176] *See* Bridy, *The Evolution of Authorship*, *supra* note 17, at 399; McCutcheon, *supra* note 17, at 954; *see also* Bridy, *Coding Creativity*, *supra* note 119, ¶ 7.

[177] *See* Yanisky-Ravid & Velez-Hernandez, *supra* note 135, at 33.

[178] *See* Bridy, *Coding Creativity*, *supra* note 119, ¶ 63; Hristov, *supra* note 119, at 442; Yanisky-Ravid, *supra* note 119, at 713; Samuelson, *supra* note 14, at 1203 (it is interesting to note that Samuelson mentions the possibility to adopt a "work made for hire" rule for computer-generated works in 1985).

inclusion in copyright law, two interesting trends emerged from it. First, most agree that there is no justification to grant rights to the machine.[179] AI systems cannot be incentivized.[180] Second, in both recent articles and in early literature, scholars consistently rely on economic arguments to allocate rights in computer-generated works.[181] Some argue that in denying protection, investment in innovation will not be compensated.[182] If computer-generated works are not protected, there will be no incentive to create new AI systems and thus valuable works for society.[183] This position is very debatable. The role of copyright law is not to strive for artificial intelligence growth in rewarding the development of the machine itself. As I will discuss in Part V, the role of copyright protection is generally described as a policy providing incentives to produce and disseminate new works.[184] More satisfactorily, other scholars ground their reasoning precisely on this objective.[185] They claim that

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[179] *See* Clifford, *supra* note 23, at 1702; Davies, *supra* note 117, at 612, 618; *see also* Perry & Margoni, *supra* note 8, at 627 ("If we give an incentive to a computer program, which as it is not human has no need of incentives in order to produce more works (unless it has been instructed to behave that way) who are we actually benefiting? The answer is nobody."); Wu, *supra* note 119, at 159.

[180] Davies, *supra* note 117, at 612; *see also* Perry & Margoni, *supra* note 8, at 627.

[181] *See* Hristov, *supra* note 119, at 437; Yanisky-Ravid, *supra* note 119, at 712; Denicola, *supra* note 119, at 273, 283; Davies, *supra* note 117, at 616–17; Farr, *supra* note 14, at 80; Samuelson, *supra* note 14, at 1226–27; Butler, *supra* note 14, at 735.

[182] *See* McCutcheon, *supra* note 17, at 956 ("Leaving works in which copyright may otherwise subsist in an authorless void leaves potentially expensive or valuable works in the public domain and it leaves investment unrewarded.").

[183] Hristov, *supra* note 119, at 439; Davies, *supra* note 117, at 616–17.

[184] *See infra* Sections V.B. and V.C.

[185] *See* Yanisky-Ravid, *supra* note 119, at 683; Denicola, *supra* note 119, at 273, 283; Glasser, *supra* note 133, ¶ 42; Samuelson, *supra* note 14, at 1226.

copyright protection can encourage humans to disseminate works that have value for the public welfare.[186]   For Samuelson, this is simply the best argument to grant a right in computer-generated works.[187]   Without such protection, people might not want to adequately disseminate such works which may benefit the society.[188]   This view is even shared by Ramalho, one of the more skeptical scholars.[189] This economic argument may thus be a good starting point to anchor the inclusion of computer-generated works in copyright law.

V.   FOSTERING CREATIVE KNOWLEDGE: THE COPYRIGHTABILITY OF COMPUTER-GENERATED WORKS

In this Part, building on the Anglo-American literature, I will suggest that the inclusion of computer-generated works in Canadian copyright law can be justified by the economic rationale confirmed by the Supreme Court of Canada in *Théberge*.[190]   Granting rights in computer-generated works could effectively participate in the utilitarian copyright purpose since AI systems are equally able to produce extrinsically valuable works for the public. Moreover, copyright may encourage the persons who arrange and distribute computer-generated works to perform these actions, even though the effects of copyright incentives can be overestimated.[191]   Recent studies have shown that copyright does not directly influence the

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[186]   Denicola, *supra* note 119, at 273, 283.

[187]   Samuelson, *supra* note 14, at 1227–28.

[188]   Samuelson, *supra* note 14, at 1227–28.

[189]   Ramalho, *supra* note 18, at 22.

[190]   Théberge v. Galerie d'Art du Petit Champlain Inc*.,* 2002 SCC 34, paras. 30–31 (Can.).

[191]   *See* McCutcheon, *supra* note 17, at 952; Samuelson, *supra* note 14, at 1227.

production and dissemination of works.[192]   Rather, I will suggest that the establishment of a stable economic framework for the marketing of creative works may incentivize people to invest in their production and distribution.[193]   It may thus be coherent with copyright law to allocate rights to arrangers of computer-generated works which would be limited in scope, similar to neighboring rights, and cover those works that have extrinsic "original" features. Since such an "arranger's right" would be in a separate regime than the general one protecting human-authored works, it would also acknowledge the particularity of authorship.[194]

A.   *Copyright Theories and Computer-Generated Works*

Over the years, numerous copyright theories have been proposed by scholars to justify the protection of creative works. Some suggest that the protection of works is sustained by the recognition of authorial rights, while others take copyright, in a more utilitarian perspective, as a tool to drive production and social access to works. These theories can be separated into two main categories: the individualistic and economic rationales.

On the one hand, the individualistic rationale for copyright protection comprises, notably, the labor justification, the personality approach, and the communication approach. The labor theory sees copyright as a circumscribed property right to creators on their

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[192]   Niva Elkin-Koren & Eli M. Salzberger, The Law and Economics of Intellectual Property in the Digital Age 65 (2013); Diane L. Zimmerman, *Copyrights as Incentives: Did We Just Imagine That?*, 12 Theoretical Inquiries L. 29, 43 (2011).

[193]   Zimmerman, *supra* note 192, at 57–58.

[194]   *See generally* Tawfik, *supra* note 9, at 44.

intellectual labor.[195]   It is grounded on Locke's assertion that "every man has a property in his own person," and thus "the labor of his body, and the work of his hands" are his property.[196]   Although the Lockean notion of labor seems limited to the transformation of tangible resources, the statement that "man has a property in his own person" can be understood broadly and includes man's property in his intellectual activity.[197]   In this sense, it relates very much to the personality approach.[198]   Under the personality theory, copyright protection is given to authors of works because they incorporated a part of themselves into the works.[199] Works share the personality of their authors, and copyrights that are inclusive of that author's personality is not "expropriat[ed]" by the free-riding of others.[200]

The communication approach is slightly different from the first two.   Works are not perceived as property goods, but as communicative acts.[201]   Copyright's role is to ensure that authors' speech (expression) is not appropriated by others.[202]   Obviously, there are some limitations to authors' exclusivity on their speech.   Since works are communicative acts, authors are in a dialogue with their

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[195]   Lior Zemer, The Idea of Authorship in Copyright Law 13–14 (2007); Laura Biron, *Creative Work and Communicative Norms: Perspectives from Legal Philosophy*, in The Work of Authorship 19, 22 (Mireille van Eechoud ed., 2014).

[196]   John Locke, *Second Treatise*, in Two Treatises of Government and A Letter Concerning Toleration 111–12 (Ian Shapiro ed., 2003) (1690); Biron, *supra* note 195, at 22.

[197]   Biron, *supra* note 195, at 24.

[198]   Biron, *supra* note 195, at 24.

[199]   Zemer, *supra* note 195, at 16.

[200]   Zemer*, supra* note 195, at 16; Biron, *supra* note 195, at 26.

[201]   Lionel Bently, *Drassinower's Vision of Copyright*, 29 I.P.J. 19, 20 (2016); Biron, *supra* note 195, at 29.

[202]   *See* Abraham Drassinower, What's Wrong With Copying? 8 (2015); Bently, *supra* note 201, at 19, 20.

audience and thus must expect responses to their works.[203] In sum, these individualistic rationales consider copyright law a natural right for authors to control the exploitation of their works, more precisely the use of their expression. Therefore, authorship is clearly the central justification of these theories. 'Authorless' works should not be protected. Nobody can request a natural right in them.

On the other hand, the economic rationale of copyright law is based on a different premise. It describes copyright as a system rewarding authors for the production and dissemination of their works.[204] Copyright allocates exclusive rights, for a limited period of time, to creators to exploit their works.[205] Without protection, it would be difficult for creators to gain back the time and money they have invested, and may be discouraged from producing future works.[206] Since creative works have the characteristics of public goods, once published, nothing can prevent their free flow.[207] In ensuring authors a control on the marketing of their works, copyright provides them incentives to create.[208] It is thus overall beneficial for

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[203] DRASSINOWER, *supra* note 202, at 8.

[204] *See* Richard A. Posner, *Intellectual Property: The Law and Economics Approach*, 19 J. ECON PERSPECT. 57, 58–59 (2005).

[205] VAVER, *supra* note 10, at 57; Yohan-Avner Benizri, *Droit d'auteur et co (régulation) : la politique du droit d'auteur sur l'Internet*, 53 MCGILL L.J. 375, 388 (2008).

[206] ROGER D. BLAIR & THOMAS F. COTTER, Intellectual Property: Economic and Legal Dimensions of Rights and Remedies 30 (2005).

[207] Christian Handke, *Intellectual Property in Creative Industries: The Economic Perspective*, *in* RESEARCH HANDBOOK ON INTELLECTUAL PROPERTY AND CREATIVE INDUSTRIES 57, 62 (Abbe E.L. Brown & Charlotte Waelde eds., 2018); Ruth Towse, Christian Handke & Paul Stepan, *The Economics of Copyright Law: A Stocktake of the Literature*, 5 REV. ECON. RES. ON COPYRIGHT ISSUES 1, 4 (2008); William M. Landes & Richard A Posner, *An Economic Analysis of Copyright Law*, 18 J. LEG. STUD. 325, 326 (1989).

[208] Benizri, *supra* note 205, at 380.

society because it encourages the production of more works available to the public.[209]   However, it is important to balance creators' rights with users' access to maximize the public good.[210]   Too strong of a protection can have adverse effects.[211]   It can reduce creation by increasing the cost of access to existing works, which are sources of inspiration for the creation of future works.[212]   In a nutshell, under the utilitarian approach, copyrights are not granted to authors because they have a natural right in the works they produced, but because it is a way to promote social welfare.[213]

This survey of the main copyright theories shows that one of the important differences between individualistic and public interest rationales is the role of authorship in copyright law.   While it is central to the individualistic justification, under the economic rationale, authorship appears as a means to benefit society.[214]   Due to the absence of authors, the possible copyrightability of computer-generated works cannot rely on the individualistic theories.   The inclusion of such works into the scope of copyright law can be solely justified under the economic rationale.   AI systems cannot be incentivized to create and produce works.   However, it is conceivable that some people behind the generation of these works can be encouraged by copyright protection.

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[209] Benizri, *supra* note 205, at 380.

[210] Landes & Posner*, supra* note 207, at 326; Benizri, *supra* note 205, at 386.

[211] Landes & Posner, *supra* note 207, at 332; Benizri, *supra* note 205, at 388.

[212] Landes & Posner, *supra* note 207, at 335, 343; Benizri, *supra* note 205, at 388.

[213] ZEMER, *supra* note 195, at 12 ("The incentive structure in utilitarian argument focuses on promoting the general public good, not placing the individual creator as an independent object entitled to a right.").

[214] ZEMER, *supra* note 195, at 11.

B.   *The Purpose of Canadian Copyright Law*

The nature of Canadian copyright law tilts strongly toward the economic rationale.   In 2002, the Supreme Court of Canada confirmed this approach in *Théberge*.[215] Binnie J., for the majority, stated that copyright law "is usually presented as a balance between promoting the public interest in the encouragement and dissemination of works of the arts and intellect and obtaining a just reward for the creator . . . ."[216] He then added that "it would be as inefficient to overcompensate artists and authors for the right of reproduction as it would be self-defeating to undercompensate them."[217]   These statements revealed copyright's two competing objectives.[218]   First, it makes clear that Canadian copyright law is primarily an economic policy.[219] It seeks to provide authors sufficient incentives, by allocating them exclusive rights, to encourage the production and dissemination of works.[220]   Second, *Théberge* also underlines the importance of users' interest. It is crucial to ensure that copyright holders' exclusive rights are limited, so they do not preclude users from benefiting from fair access to copyrighted works.[221] Since authors are also users of creative works, overly restrictive

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[215] *Théberge*, 2002 SCC 34, at paras. 30–31; VAVER, *supra* note 10, at 60; *see also* Daniel J. Gervais, *A Canadian Copyright Narrative*, 21 I.P.J. 269, 290 (2009); Daniel J. Gervais, *The Purpose of Copyright Law in Canada*, 2 UOLTJ 315, 318 (2005).

[216] *Théberge*, 2002 SCC 34, at para. 30; *see also* VAVER, *supra* note 10, at 57; ZEMER, *supra* note 195, at 12; Landes & Posner, *supra* note 207, at 326.

[217] *Théberge*, 2002 SCC 34, at para. 31.

[218] Benizri, *supra* note 205, at 385–86.

[219] Benizri, *supra* note 205, at 389.

[220] *Théberge*, 2002 SCC 34, at para. 31.

[221] *Id.* ("The proper balance among these and other public policy objectives lies not only in recognizing the creator's rights but in giving due weight to their limited nature."); *see also*, Benizri, *supra* note 205, at 380.

protection would impose "practical obstacles to proper utilization of creative works,"[222] increase their cost of creation, and ultimately reduce production of works.[223] Canadian copyright law's purpose is thus mainly instrumentalist.[224]

According to Rivoire and Gold, following *Théberge*, copyright's principal aim may be summed up as the encouragement of the creation and presence of works on the market.[225] Rights are granted to creators and copyright holders to sustain the production and distribution of works. Convenient access to these works is also essential, so users can build on them to create new ones. This dynamic between creators and users stimulates the multiplication of creative works. The Canadian balanced approach thus relates to the U.S. constitutional conception of copyright law which is "to promote the progress of . . . useful arts, by securing for limited times to authors . . . the exclusive right to their respective writings . . . ."[226] In both cases, the ultimate objective is to foster a certain form of social progress through the increase of creative works. It is further reminiscent of the U.K.'s first modern copyright law, the Statute of Anne, which sought to promote the advancement of knowledge.[227]

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[222] *Théberge*, 2002 SCC 34, at para. 32.

[223] Landes & Posner, *supra* note 207, at 335.

[224] Gervais (2005), *supra* note 215, at 317.

[225] Rivoire & Gold, *supra* note 7, at 392.

[226] Rivoire & Gold, *supra* note 7, at 392; U.S. CONST. art. I, § 8, cl. 8.

[227] The Statute of Anne, 8 Anne, c. 19 (1710) (Gr. Brit.) (first copyright act adopted by Great Britain in 1710); *see also* Tawfik, *supra* note 9, at 44–45 (stating that the encouragement of learning is recognized as the objective of the Statute of Anne); ZEMER, *supra* note 195, at 36–37 (stating that the Statute of Anne is at the origin of the Anglo-American tradition).

However, Canadian copyright law is not purely a utilitarian policy. It also incorporates rights based on the individualistic conception of copyright law.[228] Following its ratification of the Berne Convention, Canada adopted moral rights recognizing the natural entitlement of authors for the integrity of their works.[229] Nonetheless, as pointed out by Tawfik, although it could have enacted more extensive provisions, Canada has implemented only the minimum requirements imposed by the Berne Convention.[230] This suggests that Canada only wanted to comply with its international obligations. Canadian copyright law's main purpose remains grounded on the economic theory, with the individualistic rationale only supplementing it.[231] Canadian copyright law foremost seeks both to reward creators of works and safeguard the public interest in their use.

Therefore, although Binnie J. clearly did not intend to include AI systems and computers in the definition of creators—they are referred as human "artists and authors"[232]—granting rights to some persons associated with the production of computer-generated works may constitute the fair reward described in *Théberge*. This reward can incentivize the multiplication of creative works aimed by the instrumentalist objective of copyright law. Computer-generated works might not fall under the general

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[228] Tawfik, *supra* note 9, at 44 (discussing how individualistic conception was recognized through the adoption of moral rights for authors).

[229] Copyright Act, R.S.C., c C-42 §§ 14.1, 14.2, 28.2 (1985) (Can.); Biron, *supra* note 195, at 27; ZEMER, *supra* note 195, at 16; Sam Ricketson, *The 1992 Horace S. Manges Lecture: People or Machines: The Berne Convention and the Changing Concept of Authorship*, 16 COLUM. J.L. & ARTS 1, 5 (1991).

[230] Tawfik, *supra* note 9, at 44.

[231] Tawfik, *supra* note 9, at 44.

[232] *Théberge*, 2002 SCC 34, at para. 31.

regime of protection—lacking the originality central to authorship—but it is relevant to question whether such works should be encouraged by copyright law. [233]

Computer-generated works constitute a new form of "expressive knowledge" that can contribute to society. The hard labor of the author of a textbook is essential in the making of a work of quality, but the most valuable thing for society may be that the textbook exists and is accessible. If an AI system can produce a similar work, the textbook itself will provide similar knowledge to people. In the context of copyright law, "expressive knowledge" should be understood in a broad sense. It is not only restricted to student textbooks and scholarly articles. It can take different forms, such as sculptures and music, in which knowledge is less concrete.[234] As proposed by Fromer, copyrightable works are works conveying knowledge in an expressive way that can be valuable for society.[235] It can

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[233] *See supra* Section III.A.

[234] Copyright Act, R.S.C. 1985, c C-42 §§ 2, 5(1) (Can.); VAVER, *supra* note 10, at 64.

[235] Jeanne C. Fromer, *An Information Theory of Copyright Law*, 64 EMORY L.J. 71, 73 (2014) (defining "valuable knowledge" in the information theory of copyright law she proposes); *id.* at 90 ("Information theory . . . suggests that noise in a message transmission can be reduced, if not entirely overcome, by introducing redundancy into the message . . . . These redundancies make it more likely that consumers will gain access to the transmitted knowledge. [This can be applied to literary and artistic works.] In fact, oral cultures absorbed this lesson centuries ago by realizing the need to encode works, such as Homer's Odyssey, with redundancy so that they could be remembered and transmitted without loss of the encoded information."); *id.* at 127 (Stating that noise and redundancy can be seen as the expression of facts and ideas that compose the message. Redundancies are the codes and practices that help consumers access the message through the noise. "Information theory and its notion of redundancy to cut through noise are helpful to explain what about copyrightable works is valuable and how the law ought to encourage these valuable aspects.").

be expressive works containing factual or cultural knowledge.[236] Newspaper articles share factual knowledge around which journalists insert a narrative and an expressive structure in order to facilitate their communication. Cultural knowledge can be included in fictional works, notably through the expression of emotional themes such as love, death, and family from which the reader can learn.[237] It also comprises works that share an expression that is enjoyable to the public;[238] "[g]iven that society frequently values expression for its own sake[,] . . . copyright law ought to be encouraging that form of expression".[239] Artistic works, such as paintings, music, and poetry, do not necessarily convey any specific facts and ideas. A painting can factually depict a historical event and a poem can evoke a political conflict, but their interest resides mainly in an expression that contains a kind of "aesthetical" knowledge.

In brief, it does not matter whether authors intended to include knowledge in their works. To some extent, it does not diminish the value of a book of fiction if its author does not understand what he wrote or did not want his writings to take the form of stories. Factual, cultural, and aesthetical knowledge all emanate from the works themselves. In this sense, if copyright protection is granted only for works' external originality, it is irrelevant whether a work was created by a human or a machine. However, grounding the allocation of rights solely on the externalities of works can lead to unwanted outcomes. There is a social cost associated with such rights. Canadian copyright law cannot impose a cost on society if it will possibly bring no further benefit to society.

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[236] *Id.* at 73, 84.
[237] *Id.* at 86.
[238] *Id.* at 73, 84.
[239] *Id.* at 92.

C.   Granting Rights for the Fostering of Creative Progress

Under the economic rationale, copyright protection is not allocated to all works that include interesting expressive knowledge. If it does not incentivize anyone to produce and disseminate more works, then copyright is not justified. Copyright protection should positively influence the creation and distribution of works.[240] It is thus important to first circumscribe the nature of incentives and their influence on authors, arrangers, and disseminators. The application of this notion as the justifying premise for the protection of works is highly contestable. It can be argued that authors have other motivations besides monetary reward that encourage them to create.[241] Studies reveal that the act of creation happens more likely under the impulse of passion rather than following a rational, calculated plan.[242] Looking at box office hits, Hollywood creators may be driven by the economic incentives provided by copyright protection to create movies, but most authors create works motivated by their intrinsic desire for creation.[243] It makes sense that, when incentives are

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[240] Michael D. Birnhack, *The Idea of Progress in Copyright Law*, 1 BUFF. INTELL. PROP. L.J. 3, 56 (2001).

[241] *See* ELKIN-KOREN & SALZBERGER, *supra* note 192, at 65 ("Various scholars in recent years have been paying more attention to the non-monetary incentives that motivate creators, thus challenging the dominant view that monetary rewards are necessary and sufficient for inducing human creativity . . . . There are many non-monetary benefits that people gain from creative activity; there is a natural drive to create, creative passion, the need to express oneself and to communicate one's ideas.").

[242] ELKIN-KOREN & SALZBERGER, *supra* note 192, at 65; Zimmerman, *supra* note 192, at 43 ("[T]he expression of human creativity is primarily driven by intrinsic rather than extrinsic factors.").

[243] Handke, *supra* note 207, at 11; Rebecca Tushnet, *Economies of Desire: Fair Use and Marketplace Assumptions*, 51 WM. & MARY L. REV. 513, 546 (2009) ("Creators speak of compulsion, joy, and other

defined as promoting the creation, it raises concerns about the economic relevance of copyright law.

However, the concept of incentive can be construed differently. Rather than influencing creators directly, Julie Cohen submits that incentives reside in the predictable and stable market provided by the copyright framework.[244] Without copyright protection, nothing would impede the free flow of works and everybody could unrestrictedly market copies of them.[245] Copyright law precludes such free-riding by granting copyright holders exclusivity, for a limited time, in the exploitation of their works.[246] This "economic fixity" may encourage the production and distribution of creative works by offering authors, arrangers, and disseminators of works the opportunity to recover their investment.[247] Obviously, not all works will

emotions and impulses that have little to do with monetary incentives.").

[244] Julie E. Cohen, *Copyright, Creativity, Catalogs: Creativity and Culture in Copyright Theory*, 40 U.C. DAVIS L. REV. 1151, 1193 (2007) ("Copyright fulfills some important economic functions . . . and therefore plays an important role in organizing cultural production, but it is hardly ever the direct cause of a representational shift in creative practice.") [hereinafter Cohen, *Copyright, Creativity, Catalogs*].

[245] *See* Anne Barron, *Copyright Infringement, 'Free-riding', and the Lifeworld*, *in* COPYRIGHT AND PIRACY: AN INTERDISCIPLINARY CRITIQUE 93, 95–96 (Lionel Bently et al. eds., 2010); Handke, *supra* note 207, at 7; Blair & Cotter, *supra* note 206, at 206; Towse, Handke & Stepan, *supra* note 207, at 5; Landes & Posner, *supra* note 207, at 326, 328.

[246] *See* Handke, *supra* note 207, at 3.

[247] *See* Cohen, *Copyright, Creativity, Catalogs*, *supra* note 244, at 1195–96 ("[C]opyright is a means of creating economic fixity, and thus predictability, in the organization of cultural production. . . . Those are desirable goods; a society characterized by complete lack of economic certainty would be unstable, state control of cultural production would be undesirable, and a culture without shared expressive referents would be far less enjoyable. . . . [However,] copyright's goal of creating economic fixity must accommodate its mission to foster cultural

be successful enough to be profitable.[248] Nonetheless, the possibility to market them at a supra-competitive price can be a motivation to put more time and money into their production and dissemination.[249]

Copyright principally grants rights to human creators of expressive knowledge as part of its general regime providing them the exclusive privilege to reproduce, communicate, and publish their works.[250] However, Jonathan Barnett claims that copyright incentives target and affect, more particularly, arrangers and disseminators of content, whose role is crucial in the sharing of knowledge.[251] They are the ones that take the most risks

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[248] *See* Tushnet, *supra* note 243, at 517–18; Zimmerman, *supra* note 192, at 38 ("The copyright 'incentive' notwithstanding, it is more credible to understand their devotion to the production of expressive works more as a product of love than as a response to the promise of money, because they are unlikely ever to see much of the latter.").

play."); Zimmerman, *supra* note 192, at 30 ("An exclusive right to license or vend the work for a limited time period permits markets for public goods to form. In that purely business sense, intellectual property clearly acts as a kind of incentive.").

[249] *See* Zimmerman, *supra* note 192, at 57–58 ("If copyright is really about incentives to invest time and capital in the production of works by providing a mechanism to recover the investment if the product is successful, rather than the tool that incentivizes creativity, then it is a lot easier to be unsentimental, and a bit more stingy, in evaluating how to provide fair compensation for authorship through a copyright system.").

[250] Copyright Act, R.S.C. 1985, c C-42, § 3(1) (Can.); HUTCHISON, *supra* note 51, at 77 ("[T]he requirement of authorship means that original expression must emanate from a human being . . . . If skill and judgment are shown in the making of the work, the use of computer assistance is not a barrier to copyright protection. The critical factor is human originality, not the means through which originality is expressed."); Boyden, *supra* note 52, at 380; *see also supra* Section III.A.

[251] Jonathan M. Barnett, *Copyright without Creators*, 9 REV. L. & ECON. 389, 404, 433 (2013) ("[C]opyright is a precondition for

and invest the most capital in creative works.[252] Copyright might not incentivize creativity itself, as it is a more personal process. Instead, it encourages investment in works by establishing a market for their distribution and production, its "predictability . . . ensur[ing] that its ultimate purpose of promoting cultural progress is achieved."[253]

There are many rights allocated to non-authors whose role is to arrange and distribute works.[254] For instance, in the case of neighboring rights, an alternative regime in the Canadian *Copyright Act*, the maker of a sound recording has an exclusive right to its publication and distribution.[255] The maker is the one who pays for and organizes the production of the recording.[256] He is not an author.[257] He fixes the sound on a medium and facilitates the propagation of the work, so he has a right in the record.[258] This regime aims to protect the investment of the maker so as to encourage the dissemination of the

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enabling markets to select the most efficient set of intermediation structures for delivering content.").

[252] *Id.*

[253] Julie E. Cohen, *Copyright as Property in the Post-Industrial Economy: A Research Agenda*, 2011 WIS. L. REV. 141, 143–44 (2011) [hereinafter Cohen, *Copyright as Property*]; *see also* Cohen, *Copyright, Creativity, Catalogs, supra* note 244, at 1195.

[254] Denicola, *supra* note 119, at 283 ("[M]aintaining incentives for humans to disseminate works is also critical in insuring the ultimate public benefits sought by copyright."); Samuelson, *supra* note 14, at 1227.

[255] Copyright Act, R.S.C. 1985, c C-42 § 18 (Can.); VAVER, *supra* note 10, at 110.

[256] Copyright Act, R.S.C. 1985, c C-42 § 18 (Can.); VAVER, *supra* note 10, at 110.

[257] VAVER, *supra* note 10, at 109–10.

[258] VAVER, *supra* note 10, at 98.

records.[259] It focuses on the communication of works, rather than on the creation of works itself.[260] The work made in the course of the employment is another example of rights granted to an arranger and disseminator.[261] In this situation, the copyright on the work of the employee is directly allocated to the employer.[262] The copyrightability of such works does not encourage employees to produce them and the employer does not really participate in the creative process. Instead, granting the copyright to employers seeks to incentivize them to arrange the creation of new works and to disseminate them.[263] In this regard, people who arrange and organize the production of a computer-generated work fulfill an equivalent role to sound recording makers and employers. Economic rights may encourage them to make investments in computer-generated works and to share their valuable expressive knowledge with the public.[264]

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[259] VAVER, *supra* note 10, at 63 (affirming that broadcasters "do nothing original in transmitting or carrying a signal: it is their investment in distribution that is being protected").

[260] VAVER, *supra* note 10, at 97 ("Sound recordings, performances, and broadcasts are non-traditional items that communicate rather than constitute 'works.'").

[261] Copyright Act, R.S.C. 1985, c C-42 §13(3) (Can.).

[262] *Id.* at § 18; VAVER, *supra* note 10, at 110.

[263] VAVER, *supra* note 10, at 125 ("A person hired to produce material as part of her work normally expects copyright to be her employer's; for, without the hire, the works would probably not have been produced at all.").

[264] McCutcheon, *supra* note 17, at 952 ("Without that reward, the [computer-generated] work may not be made, or made as well, or disseminated; or its dissemination may be limited by technological or contractual locks, thus counteracting the policy objective of 'making a work available to the reading public.'").

D.   *Allocating Rights in Computer-Generated Works*

In light of the economic justification, the inclusion of computer-generated works in the realm of copyright law may thus be reasonable. Although some argue that, in the public interest, they should remain in the public domain, I propose that an "arranger's right" may be allocated to persons who arrange the production of computer-generated works. It would incentivize the arrangers to use new technologies for the production of artistic and literary works.

1.   The Importance of the Public Interest

The baseline of copyright law, as an economic policy tool, is the public interest.[265] Copyright is, after all, a bargain in which rights holders can exclusively exploit their works for a limited period.[266] If there is no author and there is no one else to incentivize the production and dissemination of works, a monopoly on the works is not justified.[267] They should thus fall into the public domain which comprises elements of works "that are not protected by copyright or whose protection has lapsed, due to the expiration of the duration of protection."[268] The public

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[265] ZEMER, *supra* note 195, at 12 ("The incentive structure in utilitarian arguments focuses on promoting the general public good, not placing the individual creator as an independent object entitled to a right.").

[266] ZEMER, *supra* note 195, at 11; Landes & Posner, *supra* note 207, at 326.

[267] JAMES BOYLE, THE PUBLIC DOMAIN: ENCLOSING THE COMMONS OF THE MIND 11 (2008) ("[T]he goal of the system ought to be to give the monopoly only for as long as necessary to provide an incentive.").

[268] World Intellectual Property Organization [WIPO], *Scoping Study on Copyright and Related Rights and the Public Domain*, at 5, WIPO CDIP/7/INF/2 (2011) http://www.wipo.int/edocs/mdocs/mdocs/en/cdip_7/cdip_7_inf_2.pdf [https://perma.cc/P9QU-N4PY] (prepared by Severine Dusollier).

domain contributes to the availability of expressive knowledge for use by creators and the public in general.[269]

In this respect, some argue that leaving computer-generated works in the public domain is the best option.[270] Their production does not involve sufficient human input in the creative process, so without authors to encourage, restricting access to works does not seem equitable. Even in acknowledging the participation of humans in their arrangement, several scholars think that it is not clear which individuals should be awarded rights in a copyrightable work.[271] The owner of the AI system, the programmer, and the end-user all contribute to a part of the whole process. Moreover, as argued by Elkin-Koren and Salzberger, with new technologies, distributors' contribution might be less important.[272] They may be no longer essential to making content available to a wider audience and thus less financially incentivized by copyright protection mainly to disseminate works they arranged.[273]

However, the public interest might be better served by allocating some rights in computer-generated works. First, it does not matter whether factual, cultural, and artistic knowledge comes from the mind of a human or the algorithm of a machine.[274] Computer-generated works may not be of equal value to the public, but it is also the case

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[269] Ramalho, *supra* note 18, at 21.

[270] Clifford, *supra* note 23, at 1702; Perry & Margoni, *supra* note 8, at 627.

[271] Grimmelmann, *supra* note 50, at 414; Perry & Margoni, *supra* note 8, at 627.

[272] ELKIN-KOREN & SALZBERGER, *supra* note 192, at 86 ("[W]hile in the past incentives might have been necessary for carrying on an invention or creation to wide distribution, the technological tools of today significantly decrease this rationale.").

[273] ELKIN-KOREN & SALZBERGER, *supra* note 192, at 83.

[274] *See supra* Section V.B.2.

with human-authored works. A generic superhero movie can make a billion dollars at the box office, while an independent documentary praised for its qualities by the industry can be seen by only a few thousand people.

More importantly, the fundamental point for the justification for the protection of these works lies in the incentives generated by copyright. Copyright law does not directly encourage the creation of works, but it, more generally, incentivizes the production and dissemination of works by establishing a stable and predictable framework to market copyrightable works at a supra-competitive price.[275] This economic certainty participates in the progress of knowledge and the multiplication of works.[276] Barnett suggests that it especially encourages arrangers and disseminators, the ones who "incur significant capital costs and risks in funding cultural production and distribution."[277] Moreover, despite the disruption of the knowledge market by new technologies, the role of arrangers and disseminators may still be pertinent. Contrary to Elkin-Koren and Salzberger's apprehension, Barnett underlines that "[e]ven in markets where production and distribution costs have fallen significantly, there is no decline . . . in the screening and marketing costs required to identify high-value content."[278]

In sum, despite the lack of empirical evidence supporting these economic justifications, it may thus be desirable to grant a copyright to persons who request and

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[275] Cohen, *Copyright, Creativity, Catalogs*, *supra* note 244, at 1193; Zimmerman, *supra* note 192, at 57–58; *see also supra* Section V.C.1.
[276] Cohen, *Copyright as Property*, *supra* note 253, at 143–44; *see also* Cohen, *Copyright, Creativity, Catalogs*, *supra* note 244, at 1195.
[277] Barnett, *supra* note 251, at 404, 433.
[278] Barnett, *supra* note 251, at 415.

disseminate computer-generated works.[279] Exclusive rights on the works can encourage the production and the sharing of more creative knowledge with the public, which can be overall beneficial for society. Works might not have to be authored for the pursuit of the copyright's principal objective: the encouragement of creation and the presence of works on the market. The use of AI systems may push expressive knowledge toward paths still unexplored by authors.

2. Toward an "Arranger's Right"

Therefore, I suggest that it may be coherent with Canadian copyright policy to grant rights in computer-generated works under a regime similar to the neighboring rights. I could have favored a provision inspired by the United Kingdom regime or the "work made for hire" doctrine as suggested by many scholars, but it does not sufficiently reflect the absence of a human author in computer-generated works.[280] To more firmly distinguish this regime from the general one, no one should be recognized as the "deemed author" and only exclusive economic rights should be granted in such works. The rationales of production for human-authored works and computer-generated works are different and their protection should be considered on a distinct basis.[281] Enacting a provision similar to neighboring rights for works produced by AI systems would protect the commercial aspect of their

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[279] HUTCHISON, *supra* note 51, at 2; Jessica D. Litman, *The Public Domain*, 39 EMORY L.J. 967, 998 (1990).

[280] Copyright, Designs and Patents Act (1988) § 9(3) (Eng.) (stating that the author of a computer-generated work is "the person by whom the arrangements necessary for the creation of the work are undertaken"); *see also* Bridy, *Coding Creativity*, *supra* note 119, at 63; Hristov, *supra* note 119, at 442; McCutcheon, *supra* note 17, at 960; Yanisky-Ravid, *supra* note 119, at 55.

[281] Ramalho, *supra* note 18, at 21.

distribution without recognizing authorship and thus limit the protection to essential rights.

It is interesting to note that this solution is not rejected by two ardent opponents to the extension of copyright law to computer-generated works. Ricketson, who argues that human authorship is enshrined in the Berne Convention, is open to the idea that countries may extend their related or neighboring rights in copyright law since it is a parallel regime.[282] Similarly, Ginsburg, who also supports the human aspect in copyright law, suggests that allocating rights in computer-generated works without considering the owner of such rights as the author may be a possible option.[283] Considering the absence of authorship, she adds that these rights should however be limited.[284]

I propose that users of AI systems, who arrange the production of computer-generated works, are in the best position to receive these economic rights. Programmers and owners may be at the origin of the AI system but are not responsible for the generation of works. On the contrary, users arranging computer-generated works, though they are not authors, may act as editors or curators. They request and distribute these works, so exclusive rights

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[282] Ricketson, *supra* note 229, at 30 ("[F]rom the point of doctrinal purity, this [including computer-generated works] is a sensible decision, leaving member states free to deal with such subject matter under their neighboring rights laws.").

[283] Ginsburg, *The Concept of Authorship*, *supra* note 156, at 1070 ("It is unfortunate, as well as confusing, that the U.K. law here conflates authorship with vesting of copyright ownership . . . . But it is possible to vest ownership in productions whose human input is uncertain, without tricking out the owner in the garb of an author. For example, the Australian law distinguishes works of authorship (whose creators are, implicitly, human beings) from 'subject matter other than works.'").

[284] Ginsburg, *The Concept of Authorship*, *supra* note 156, at 1092.

can encourage them to make the works available on the market.[285] One can argue that the rationale for allocating a right in computer-generated works requested by an "arranger" is similar to the rationale for unpublished works created by long-dead authors. They are culturally valuable, but no protection would be granted for a newly found work of Da Vinci or Shakespeare.[286] In both situations, the role of the persons who possess such works is to distribute them, so there is little justification to extend copyright law to computer-generated works. However, there is an important difference separating these cases. Unlike the discoverers of unpublished works, in requesting the generation of computer-generated works, the person arranging their production expects that a certain type of work will be produced by the machine. The arranger has at least some control and a minimal intention on the nature of the generated work. They use AI systems to assist them in their endeavors. For instance, it can be a newspaper editor using a system to generate articles. The newspaper editor may request the system to produce articles about recent news in a specific region. Although he may not be aware of recent news, he expects the nature and the content of the works produced by the system. In the end, he may choose to publish them or not.

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[285] Ramalho, *supra* note 18, at 22 ("It is however possible that someone who disseminates AIs creations (thus bringing them to the public) needs to be incentivized or rewarded for doing so."); Samuelson, *supra* note 14, at 1227; *see also* Ginsburg, *People Not Machines*, *supra* note 175, at 134 (stating that there should be some incentives to justify the copyright protection of computer-generated works).

[286] There was no copyright at the time of Da Vinci and Shakespeare. However, even for authors who have recently died, there is a limitation on the protection of their unpublished works. In Canada, their unpublished works are copyrighted up to fifty years following their deaths. Copyright Act, R.S.C. 1985, c C-42 § 7 (Can.); VAVER, *supra* note 10, at 145.

Aside from neighboring rights, Canadian copyright law has already recognized the contribution of arrangers. Until 2012, the copyright in a photograph was still allocated to the owner of the negative of the photograph who was also the deemed author.[287] This regime rewarded the person who made the financial investment in the photographic material.[288] Usually, the first owner of the copyright was the person who initiated the creation of the photograph. It could be the person who furnishes the equipment, or the one commissioning the photograph.[289] For instance, "[t]he person whose photo is taken in a coin-operated automatic photo booth [was] . . . the first owner of the photo, since payment would usually cover ownership of the negative."[290] Obviously, the status of photography is different than the status of computer-generated works in copyright law. Photographs may embed expression of human originality while computer-generated works fit less naturally into the copyright framework, lacking the minimal authorial input.[291] However, the general reasoning of the arrangement of photographs may apply to reward the contribution of users of works produced by AI systems as well.

Furthermore, such a reward should be circumscribed to reflect the nature of computer-generated

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[287] Vaver, *supra* note 10, at 122, 146; Copyright Act, R.S.C. 1985, c C-42, §§ 10, 13(2).

[288] Vaver, *supra* note 10, at 122.

[289] Copyright Act, R.S.C. 1985, c C-42, §§ 10, 13(2).

[290] *Copyright and Privacy in Photography*, CIPPIC (July 8, 2019), https://cippic.ca/en/FAQ/Photography_Law [https://perma.cc/MCT3-A NYU].

[291] Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53, 60 (1884) (expanding copyright protection to photographs in the United States); Nottage v. Jackson [1883], 11 QBD 627 at 631–32 (Eng.) (expanding copyright protection to photographs in the United Kingdom); Hughes, *supra* note 86, at 20; Bowrey, *supra* note 88.

works. It can consist of a limited economic right allocated to the arrangers of works. The purpose of this "arranger's right" would be to make valuable knowledge widely available by providing to arrangers a predictable and stable framework for the production and distribution of computer-generated works.[292] It may thus attenuate the uncertainty toward their commercial exploitation on the market. Recently, the selling of an artwork produced by an algorithm by the auction house Christie's raised concerns on the actual person to reward since the team that generated the work borrowed substantial parts of an algorithm designed by another programmer.[293] The current regime does not offer a clear answer to such issues and may discourage people from investing time and money in computer-generated works that can benefit society.

In this vein, the "arranger's right" may further ensure some protection to works in which human authorship is not clear, which can have a positive effect on human creation. Throughout this Article, computer-generated works have often been contrasted with human-authored ones, but it is more probable that in the next years, AI systems will mainly serve human authorship endeavors. Authors pushing the boundaries of creation may include AI creations in their works. Issues will more likely concern hybrid works in which the role of the *author* is hardly discernible.[294] The "arranger's right" would thus prevent courts from applying too largely the notion of intellectual

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[292] *See* Cohen, *Copyright as Property*, *supra* note 253, at 143–44; *see also* Cohen, *Copyright, Creativity, Catalogs*, *supra* note 244, at 1195.
[293] Gabe Cohn, *AI Art at Christie's Sells for $432,500*, N.Y. TIMES (Oct. 25, 2018), https://www.nytimes.com/2018/10/25/arts/design/ai-art-sold-christies.html [https://perma.cc/E98S-3P7L].
[294] Denicola, *supra* note 119, at 269–70.

effort, given that a more limited and reasonable protection is also granted to computer-generated works.[295]

On the other hand, it is important that the "arranger's right" takes into consideration public interest and remains very limited. For instance, this right should not include the privilege of authors regarding moral rights and the integrity of their works.[296] Moreover, once published, the public interest for protecting computer-generated works diminishes quickly. The exclusive right should thus last for the shortest period of time necessary to commercially exploit computer-generated works.[297] More importantly, it should also be granted only to computer-generated literary or artistic works falling under the subject-matter of copyright law. The purpose of including them in the scope of copyright law is not to protect each word, picture, and musical note produced by computers. Like human-authored works, computer-generated works must provide expressive knowledge to the public.

Ultimately, looking at the importance of arrangers in the production of computer-generated works leads to the conclusion that works produced, selected, and published by an intelligent agent should not be copyrighted. By an

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[295] *Cf.* Hughes, *supra* note 86, at 398 (proposing a similar reasoning concerning the originality of photographs, arguing that recognizing non-original expressions "can help keep lawyers and policymakers from distorting the originality standard. Without this system, courts may continue to stretch originality to include in the realm of copyright many arguably uncreative photographs and videos.").

[296] Copyright Act, R.S.C. 1985, c C-42, §§ 14.1, 14.2, 28.2 (Can.).

[297] Ramalho, *supra* note 18, at 22 (he suggests that "the EU Term of Protection Directive, could be a solution. [Its] Article 4 . . . gives publishers a 25-year protection equivalent to the economic rights of the author for the first lawful publication or communication of a previously unpublished work after the expiry of copyright protection . . . . This right is exactly intended to stimulate publication of works.").

intelligent agent, I mean a system that does not require the involvement of a human being in the production and distribution of the works. It can be a web bot that posts its new creations on a regular basis on social media platforms. It can also be works autonomously produced by an AI system and stocked in a public or private database without a direct request from a human. In both cases, there are no people to incentivize for the production and distribution of such works. Humans are completely absent from the process of creation and distribution.[298] No one arranges or curates the generation of these works. There is no justification to allocate a right in such works. Again, we cannot grant copyright to the intelligent agent itself. A machine is still not a legal person and still cannot be incentivized.[299] The exclusion of such works from copyright protection may address the most important concerns expressed by skeptical scholars.[300]

VI.   CONCLUSION

In this Article, I explored the possibility of including computer-generated works in the scope of copyright protection. Building on the arguments discussed by scholars in past decades, I examined this question from a Canadian perspective. I asserted that, following *Théberge*, the purpose of Canadian copyright law is mainly economic and aims to encourage the multiplication of valuable creative works. Hence, since computer-generated works may also share valuable creative knowledge with

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[298] BOYLE, *supra* note 267, at 11 ("[T]he goal of the system ought to be to give the monopoly only for as long as necessary to provide an incentive.").

[299] Davies, *supra* note 117, at 612; Perry & Margoni, *supra* note 8, at 627.

[300] Grimmelmann, *supra* note 50, at 415; Zatarain, *supra* note 172, at 92, 102.

society, their protection seems reasonable provided it incentivizes someone. I thus proposed that, if the Canadian legislator considers that creative knowledge produced by AI systems is central to its copyright policy, the granting of limited economic rights to the "arrangers" of these computer-generated works may be justified. It can encourage the arrangers to produce and distribute these works. This extension of copyright law would not necessarily signify that computer-generated works will take the place of human-authored works in the creative market. Artificial intelligence offers amazing possibilities, but chances are that human-authored creation will always have a special place.[301] Beyond their perceivable qualities, artistic works remain a unique channel between the hearts of artists and their audiences.

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[301] HECTOR J. LEVESQUE, COMMON SENSE, THE TURING TEST, AND THE QUEST FOR REAL AI 133 (2017); Yanisky-Ravid, *supra* note 119, at 703.

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(PROOF REQUIRED)

METHOD OF PAYMENT:

☐ CHECK – ENCLOSED FOR $_____ (PAYABLE TO IDEA – UNH LAW)

☐ CREDIT CARD – PLEASE CHARGE MY CREDIT CARD FOR $_____

☐ VISA ☐ MASTERCARD ☐ AMERICAN EXPRESS ☐ OTHER _____

CREDIT CARD #: _____

EXPIRATION DATE: _____

SIGNATURE: _____

NAME/TITLE: _____

COMPANY/FIRM: _____

ADDRESS: _____
_____
_____

CITY/STATE/ZIP/COUNTRY: _____

EMAIL: _____ PHONE: _____